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

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Introduction

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

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

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

Bid Submission Requirements

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

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

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

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

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

Notices to Bidders

Project Labor Agreement & Single Contract

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

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

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

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

Pre Bid Questions (PBQs)

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

NYC Contract Financing Loan Fund

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

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

M/WBE Notice to Prospective Contractors

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

ARTICLE I. M/WBE PROGRAM

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

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

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

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

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

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

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

PART A

PARTICIPATION GOALS FOR CONSTRUCTION, STANDARD

AND PROFESSIONAL SERVICES CONTRACTS OR TASK ORDERS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

PART B

MISCELLANEOUS

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

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

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

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

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

ARTICLE II. ENFORCEMENT

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

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

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

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

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

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

(d) terminating the Contract;

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

(f) withholding payment or reimbursement;

(g) determining not to renew the Contract;

(h) assessing actual and consequential damages;

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

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

(k) taking any other appropriate remedy.

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

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

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

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

Affirmation

The Bidder affirms and declares:

1. The said bidder is of lawful age and the only one interested in this bid; and no person, firm or corporation other than hereinbefore named has any interest in this bid, or in the Contract proposed to be taken.

2. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief: (1) the prices in this bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor; (2) unless otherwise required by law, the prices quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and (3) no attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

3. No councilman or other officer or employee or person whose salary is payable in whole or in part from the City Treasury is directly or indirectly interested in this bid, or in the supplies, materials, equipment, work or labor to which it relates, or in any of the profits thereof.

4. The bidder is not in arrears to the City of New York upon debt or contract or taxes, and is not a defaulter, as surety or otherwise, upon any obligation of the City of New York, and has not been declared not responsible, or disqualified, by any agency of the City of New York or State of New York, nor is there any proceeding pending relating to the responsibility or qualification of the bidder to receive public contracts except as disclosed in PASSPort.

5. The bidder hereby affirms that is has paid all applicable City income, excise and other taxes for all it has conducted business activities in New York City.

6. The bidder, as an individual, or as a member, partner, director or officer of the bidder, if the same be a firm, partnership or corporation, executes this document expressly warranting and representing that should this bid be accepted by the City and the Contract awarded to him, he and his subcontractors engaged in the performance:

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

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

7. Compliance Report

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

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

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

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

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

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

    I hereby:

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

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

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

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

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

Pre-Award Process

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

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

****

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

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

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

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

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

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

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

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

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

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

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

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

(5) List of key material suppliers.

(6) Preliminary bar chart time schedule

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

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

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

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

Project References

A. Contracts completed by the bidder

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

Project & Location	Contract Type	Contract Amount ($000)	Date Completed	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. (if different from owner)
C34855 - DCE Shop Component Repairs (Phase 2) at 239th Street, Concourse & East New York Maintenance Shops in the Boroughs of Bronx & Brooklyn	General Contractor	$32,586,389.00	10-Jun-22	MTA NYCT	Kavin Vani P. 1.646.252.6561
NYCCT Pearl Building 3rd floor Renovation, 259 Adams Street, Brooklyn, NY 11201	General Contractor	$11,322,888.00	31-Dec-24	CUNY	Michael Costache, MCostach@dasny.org 917-299-3863
General Construction Services in Manhattan and the Bronx Contract # CTI 069 20201400136	General Contractor	$ 7,088,096.00	30-Jun-23	NYC HRA	James Byrnes P. 929-252-2864
NYCHA RAD - Contract # 070-100 and 040-100_456 E173rd St, Bronx, NY 10457	Sub-Contractor	$12,084,000.00	20-Jun-22	Procida Construction Corp.	Joseph Procida P.1.917.803.9730
PS721X, Contract # C000014832, 2697 Westchester Avenue, Bronx, NY 10461	General Contractor	$9,169,223.00	30-Sep-22	NYC SCA	Muhammad Sahid 347-203-0050

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)
Retaining Walls Rehabilitation & Corrective Maintence- Various in the city of New York	General Contractor	$36,722,448	$16,520,800	$34,861,490	27-Mar-27	NYS DOT	Chenfeng Hu 718-280-7080
Woodhull Roof Replacement - NYCHHC_760 Broad way, Brooklyn, NY 11206	General Contractor	$16,096,003	$10,578,182	$10,272,085	25-Nov-25	NYCHHC	James Clahar 516-998-6989
PS230K_ 1 Albemarle Road, Brooklyn, NY 11218	General Contractor	$12,748,448	$9,351,349	$2,509,545	15-Oct-25	NYC SCA	Raymond Wong 718-912-0455
Bushwick Roof Reconstruction, 1675 Broadway Brooklyn, NY 11207	General Contractor	$6,648,588	$3,840,100	$5,640,588	08-Aug-26	NYC DHS	Muyaad Daoud 917-993-4855
DOT Admin Building & Grage-Roof and HVAC System Upgrades, 5 Dubois Ave, Staten Island, NY 10310	General Contractor	$8,536,049	$4,268,024.50	$8,536,049	25-Oct-27	DDC DOT	Ghanshyam Patel 646-617-9818

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)

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

FMS/Project ID: HH112FTRF

Project Name: Fort Washington Armory Roof Replacement/HVAC Upgrade (Large GC PQL)

Name of the Bidder: Zaman Construction Corp.

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Vendor Quote (Yes/ No)	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
		DIVISION 01 - GENERAL REQUIREMENTS										
						General Requirements: DIVISION 01 - GENERAL REQUIREMENTS EXCUDING the following 6 items: 1) 01 50 00; 3.4-Temporary Electrical Service.2) 01 50 00; 3.5-Temporary Heat. 3) 01 50 00; 3.8-Field Office. 4) 01 50 00; 3.14-Rodent and Insect Control. 5) 01 50 00; 3.18-Security Guards.6) 01 54 23; 1.9-Sidewalk Sheds.These 6 items must be filled out separately on the Bid Submission Form and PASSPort Item Grid. (for details see tab "HardCostGeneralRequirements" at Division 1 General Requirements sheet)						
						ADMINISTRATIVE REQUIREMENTS	1.00	JOB	$ 750,000.00			$ 750,000.00
						QUALITY REQUIREMENTS	1.00	JOB	$ 30,000.00			$ 30,000.00
						TEMPORARY FACILITIES AND CONTROLS	1.00	JOB	$ 450,000.00			$ 450,000.00
						PRODUCT REQUIREMENTS	1.00	JOB	$ 70,000.00			$ 70,000.00
						EXECUTION AND CLOSEOUT REQUIREMENTS	1.00	JOB	$ 40,000.00			$ 40,000.00
						LIFE CYCLE ACTIVITIES	1.00	JOB	$ 740,000.00			$ 740,000.00
						LICENSE FEES	1.00	JOB	$ 19,000.00			$ 19,000.00
						PERMIT COSTS	1.00	JOB	$ 75,000.00			$ 75,000.00
						BOND FEES	1.00	JOB	$ 300,000.00			$ 300,000.00
						INSURANCE	1.00	JOB	$ 150,000.00			$ 150,000.00
		copy above cell and insert copied cell above the row										
						SUB TOTAL						**$ 2,624,000.00**
		DIVISION 02 - EXISTING CONDITIONS										
			02 41 19 Selective Demolition									
						Removal of existing flashings at walls, curbs, MEP equipment, etc.	1,608.00	LF	$ 1,608.00	$ 6,432.00		$ 8,040.00
						Removal of existing equipment rails/flashings at MEP equipment, etc.	29.00	LF	$ 58.00	$ 145.00		$ 203.00
						Removal of existing pipe support rails/flashings at MEP equipment, etc.	24.00	LF	$ 48.00	$ 120.00		$ 168.00
						Remove abandoned duct and curb	22.00	LF	$ 44.00	$ 110.00		$ 154.00
						Remove abandoned duct and curb	18.00	LF	$ 36.00	$ 90.00		$ 126.00
						Remove skylight/fan unit including curb	1.00	EA	$ 200.00	$ 1,500.00		$ 1,700.00
						Remove existing brick parapet wall at East elevation, including terra cotta coping and backup to level of flashing	147.00	LF	$ 5,880.00	$ 20,580.00		$ 26,460.00
						Remove existing brick at SW corner parapet wall including backup to level of flashing (assembly is approx. 2'2" thick)	25.00	LF	$ 2,500.00	$ 8,750.00		$ 11,250.00
						Remove, salvage, store, rehabilitate, SW corner custom terracotta coping stone (approx. 2'3" thick x 11" high)	28.00	LF	$ 5,600.00	$ 7,000.00		$ 12,600.00
						Remove existing brick at NW corner parapet wall including backup to level of flashing (assembly is approx. 2'2" thick)	23.00	LF	$ 2,300.00	$ 8,050.00		$ 10,350.00
						Remove, salvage, store, rehabilitate, SW corner custom terracotta coping stone (approx. 2'3" thick x 11" high)	27.00	LF	$ 5,400.00	$ 6,750.00		$ 12,150.00
						Remove copper thruwall flashing at NW & SW corner parapet walls	38.00	LF	$ 38.00	$ 152.00		$ 190.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

FMS/Project ID: HH112FTRF

Project Name: Fort Washington Armory Roof Replacement/HVAC Upgrade (Large GC PQL)

Name of the Bidder: Zaman Construction Corp.

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Vendor Quote (Yes/ No)	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
						Remove existing roof hatch, protect existing roof opening	2.00	EA	$ 2,000.00	$ 8,000.00		$ 10,000.00
						Remove existing smoke hatch, store for re-use, protect existing roof opening	2.00	EA	$ 1,200.00	$ 6,000.00		$ 7,200.00
						Remove existing roof access ladder	2.00	EA	$ 400.00	$ 2,000.00		$ 2,400.00
						Remove existing roof drains	17.00	EA	$ 510.00	$ 1,700.00		$ 2,210.00
						Remove metal copings at roof B and C parapet walls	922.00	LF	$ 1,844.00	$ 9,220.00		$ 11,064.00
						Remove satalite dish from corner parapet wall	1.00	EA	$ 65.00	$ 1,000.00		$ 1,065.00
						Remove antenna corner parapet wall	1.00	EA	$ 66.00	$ 1,000.00		$ 1,066.00
						Remove existing ductwork supports	40.00	EA	$ 2,000.00	$ 4,000.00		$ 6,000.00
						Remove terracotta coping	45.00	LF	$ 450.00	$ 2,250.00		$ 2,700.00
			02 82 13 Asbestos Abatement									
						Asbestos abatement						
						Removal of existing roof membrane bottom layer and contaminated top layer at North sloped Roof B	9,772.00	SF	$ 97,720.00	$ 127,036.00		$ 224,756.00
						Removal of existing roof membrane bottom layer and contaminated top layer at South sloped Roof C	9,920.00	SF	$ 99,200.00	$ 128,960.00		$ 228,160.00
						Removal of existing roof membrane bottom layer and contaminated top layer at West flat Roof E	4,836.00	SF	$ 48,360.00	$ 62,868.00		$ 111,228.00
						Removal of existing roof membrane bottom layer and contaminated top layer at East flat Roof F	5,061.00	SF	$ 50,610.00	$ 65,793.00		$ 116,403.00
						Removal of existing roof membrane bottom layer and contaminated top layer at West flat Roofs D,G & H	3,553.00	SF	$ 35,530.00	$ 46,189.00		$ 81,719.00
						Removal of existing roofing/waterproofing on vertical surface of parapet/rising walls, all roof areas	1,732.00	SF	$ 17,320.00	$ 22,516.00		$ 39,836.00
						Removal of drain flashing/tar, stack/flue flashing/tar, base flashing/bottom layer and contaminated top layer, caulk/waterproofing tar on sheet metal coping - Roof B	1,222.00	SF	$ 12,220.00	$ 15,886.00		$ 28,106.00
						Removal of drain flashing/tar, stack/flue flashing/tar, base flashing/bottom layer and contaminated top layer, caulk/waterproofing tar on sheet metal coping - Roof C	1,222.00	SF	$ 12,220.00	$ 15,886.00		$ 28,106.00
						Removal of base flashing, access ladderspitch pocket tar, clerestory frame tar waterproofing membrane flashing/tar - Roof E	916.00	SF	$ 9,160.00	$ 11,908.00		$ 21,068.00
						Removal of dunnage flashing/tar, base flashing top and bottom layer, pitch pocket tar, parapet wall tar waterproofing mmbrane, clerestory frame tar waterproofing membrane - Roof F	1,438.00	SF	$ 14,380.00	$ 18,694.00		$ 33,074.00
						Removal of access hatch and skylight flashing/tar, exhaust flashing/tar, parapet wall covering/tar waterproofing membrane, wall (west) tar waterproofing material/membrane, base flashing/top and bottom layers, tar paper membrane beneath copper siding/counter flashing - Roof D	1,170.00	SF	$ 11,700.00	$ 15,210.00		$ 26,910.00
						Removal of exhaust flashing/tar, parapet wall tar waterproofing membrane, wall (west) tar waterproofing material/membrane, base flashing/top and bottom layers, tar paper membrane beneath copper siding/counter flashing - Roof G	1,204.00	SF	$ 12,040.00	$ 15,652.00		$ 27,692.00
						Removal of exhaust flashing/tar, duct work penetration flashing/tar, stack/flue flashing/tar, parapet wall tar waterproofing membrane, wall (west) tar waterproofing material/membrane, base flashing, tar paper membrane beneath copper siding/counter flashing - Roof H	788.00	SF	$ 7,880.00	$ 10,244.00		$ 18,124.00
						Air monitoring	1.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

FMS/Project ID: HH112FTRF

Project Name: Fort Washington Armory Roof Replacement/HVAC Upgrade (Large GC PQL)

Name of the Bidder: Zaman Construction Corp.

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Vendor Quote (Yes/ No)	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
												$ -
		copy above cell and insert copied cell above the row										
									$ 460,587.00	$ 651,691.00		$ 1,112,278.00
		DIVISION 03 - CONCRETE										
			03 30 00 Cast-in-Place Concrete									
						Repair underside of concrete slab where delamination has occurred ,partial depth repair. (allow 100sf of repair) Note #5/S-100, detail 3/S-301	100.00	SF	$ 5,000.00	$ 6,000.00		$ 11,000.00
						Mock-up: Spall restoration (1) 4" x 4" spall restoration area.	1.00	EA	$ 200.00	$ 800.00		$ 1,000.00
						Light weight concrete infill (3 1/2" thickness) over 1.5" thick, 18 ga metal deck at removed/abandoned MEP/skylights det.1/S-302 (Note #2/S-100)	69.00	SF	$ 1,380.00	$ 2,070.00		$ 3,450.00
						Note #4/S-100 - Roofs D & G, 20% of decking to be removed and replace (Demo in Div. 2). Det.6/S-302	657.00	SF	$ 16,425.00	$ 16,425.00		$ 32,850.00
						New 6" concrete equipment pad for relocated ACCU-2 unit	1.00	EA	$ 400.00	$ 600.00		$ 1,000.00
												$ -
		copy above cell and insert copied cell above the row										
									$ 23,405.00	$ 25,895.00		$ 49,300.00
		DIVISION 04 - MASONRY										
			04 01 20.91 Unit Masonry Restoration									
						Build East parapet wall to 42" h.above insulation level to code compliant height (this will be sitting on an existing parapet wall 16" h.) (26" h.new wall x 2'2" wide) A-404, det.2/A-401, Details 5/S-302	147.00	LF	$ 110,250.00	$ 129,360.00		$ 239,610.00
						Build Northwest and Southwest corner parapet walls to 42" h.above insulation level to code compliant height, 26" th. Wall, terracotta coping 2'2" x 1'th.	48.00	LF	$ 48,000.00	$ 48,000.00		$ 96,000.00
						Masonry wall to be repointed, Note #2/S-202	1,050.00	SF	$ 10,500.00	$ 28,350.00		$ 38,850.00
						Clean efflorescence from brick	2,380.00	SF	$ 4,760.00	$ 4,760.00		$ 9,520.00
						Masonry wall, crack repair. Detail 8/S-300, Note #3/S202	40.00	LF	$ 7,200.00	$ 8,000.00		$ 15,200.00
						Note #7/S-100 - Existing steel beam to masonry beam pocket: Chop/remove existing brick at steel beam, grind steel members, and install new brick around existing steel member, coat steel beam and connections with Sika Armortec 110 or equivalent (Detail 1/S-301)	14.00	EA	$ 11,200.00	$ 14,000.00		$ 25,200.00
						Note #7/S-100 - Contractor allowance, at 30% of existing steel beam to masonry beam pocket : Chop/remove existing brick at steel beam, install new brick around existing steel member after steel beam repair, temporary shoring, cut corroded portion of beam and remove bearing plate, new bearing plate and anchors, replace corroded portion of beam with new welded plates/angles, coat steel beam and connections with Sika Armortec 110 or equivalent (Detail 2/S-301)	7.00	EA	$ 7,000.00	$ 10,500.00		$ 17,500.00
						Mock-up: Brick 10 sq. ft. or pointing mortar in brick masonry	1.00	EA	$ 750.00	$ 1,500.00		$ 2,250.00
						Mock-up: Limestone 10 sq. ft. of pointing mortar in limestone masonry	1.00	EA	$ 750.00	$ 1,500.00		$ 2,250.00
						Mock-up: Brick replacement 2 brick masonry units	1.00	EA	$ 200.00	$ 800.00		$ 1,000.00
						Mock-up: Spall restoration: one 4" x 4" spall restoration area	1.00	EA	$ 500.00	$ 1,200.00		$ 1,700.00
						Mock-up: Limestone crack restoration: one crack restoration area	1.00	EA	$ 500.00	$ 1,200.00		$ 1,700.00
			04 03 21.21 Terra Cotta Conservation Treatment									
						Restore and reglaze existing terracotta banding on West Elevation (approx. 9" high) 1/A-401	109.00	LF	$ 16,350.00	$ 16,350.00		$ 32,700.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

FMS/Project ID: HH112FTRF

Project Name: Fort Washington Armory Roof Replacement/HVAC Upgrade (Large GC PQL)

Name of the Bidder: Zaman Construction Corp.

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Vendor Quote (Yes/ No)	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
						Restore and reglaze existing terracotta coping on West Elevation (approx. 16" high x 2'2" wide) 1/A-401	98.00	LF	$ 19,600.00	$ 19,600.00		$ 39,200.00
						Restore and reglaze existing terracotta feature on West Elevation (rectagular shape approx. 6" high x 12" wide) 1/A-401	37.00	EA	$ 7,400.00	$ 11,100.00		$ 18,500.00
						Mock-ups for restoration methods of patching and glaze restoration (allow for 6 types), terracotta notes A-404	6.00	EA	$ 6,000.00	$ 6,000.00		$ 12,000.00
			04 21 16 Ceramic Glazed Clay Masonry									
						Note #7/S-100 - Contractor allowance, at 30% of existing steel beam to masonry beam pocket : Chop/remove existing brick at steel beam, install new brick around existing steel member after steel beam repair, temporary shoring, cut corroded portion of beam and remove bearing plate, new bearing plate and anchors, replace corroded portion of beam with new welded plates/angles, coat steel beam and connections with Sika Armortec 110 or equivalent (Detail 2/S-301)	147.00	LF	$ 11,760.00	$ 7,350.00		$ 19,110.00
			04 21 29 Terra Cotta Masonry									
						Replace terracotta coping at top of parapet to be replaced in kind with new terracotta coping, det.5/S-301 (approximately 45 lin. ft. per note 8/S-100)	45.00	LF	$ 18,000.00	$ 6,750.00		$ 24,750.00
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									$ 280,720.00	**$ 316,320.00**		**$ 597,040.00**
		DIVISION 05 - METALS										
			05 12 00 Structural Steel Framing									
						New galvanized steel dunnage beams W16x40 (104 LF + 10% for connections)	2.29	TON	$ 45,760.00	$ 45,760.00	$ 9,152.00	$ 100,672.00
						Existing dunnage to be removed and reinstalled	73.00	LF	$ -	$ -	$ -	$ -
						L4x3x3/8" at filled in openings in concrete deck	66.00	LF	$ 9,900.00	$ 8,580.00		$ 18,480.00
						L6x6x3/8" x 6" long, at filled in openings in concrete deck	16.00	LF	$ 4,800.00	$ 4,800.00		$ 9,600.00
			05 31 00 Steel Decking									
						New 1.5", 18 ga. metal roof decking	726.00	SF	$ 10,890.00	$ 10,890.00		$ 21,780.00
			05 50 00 Metal Fabrications									
						Railing - 01: parapet wall mounted, 2 line rail (HSS 2x2x1/4) with 3'5" high vertical posts (HSS 2x2x1/4) 4'0" on center with wall plate (PL 3/8" x 11" x 2'3" wide with 8 3/4" diameter holes. Install with threaded rods into parapet wall with HILTI- HY-270 adhesive. Details 1/S-300	899.00	LF	$ 179,800.00	$ 107,880.00		$ 287,680.00
						Railing - 02: Deck mounted,2 line rail (HSS 2x2x1/4) with 5'0" high vertical posts (HSS 2x2x1/4) 4'0" on center with wall plate (PL 3/8" x 11" x 2'3" wide with 8 3/4" diameter holes. Install with threaded rods into parapet wall with HILTI- HY-270 adhesivedeck wall mounted, Details 3/S-300 (at roof E)	90.00	LF	$ 27,000.00	$ 16,200.00		$ 43,200.00
						Railing - 03: deck mounted, 2 line rail (HSS 2x2x1/4) with 3'6" high vertical posts (HSS 2x2x1/4) 4'0" on center with deck plate (2 -PL 3/8" x 11" x 1'0" wide with 4 3/4" diameter bolts in 1 1/2" diameter oversized holes. Fill in oversized holes with pressure injected SIKA 211. Details 5/S-300 (at roofs G & H)	209.00	LF	$ 45,980.00	$ 31,350.00		$ 77,330.00
						Furnish and install roof ladder Roof D to Roof E, 4/S-301	1.00	EA	$ 11,350.00	$ 4,000.00		$ 15,350.00
						Furnish and install roof ladder Roof G to Roof E, 4/S-301	1.00	EA	$ 12,000.00	$ 4,000.00		$ 16,000.00
						Modify existing roof ladders; Roof F to Roof A, and Roof E to Roof A	2.00	EA	$ 10,000.00	$ 8,000.00		$ 18,000.00
						Furnish and install crossover ladder over piping on Roof E, approx. 9' long x 3 feet wide, 3 treads each side with platform and railings on both sides 1/A.002	2.00	EA	$ 12,000.00	$ 10,000.00		$ 22,000.00
						Equipment rail/curb, 8" x 3'0" long	10.00	EA	$ 7,000.00	$ 5,000.00		$ 12,000.00

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Name of the Bidder: Zaman Construction Corp.

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						Pipe support rail/curb, 8" x 3'0" long	8.00	EA	$ 5,600.00	$ 4,000.00		$ 9,600.00
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						SUB TOTAL			**$ 382,080.00**	**$ 260,460.00**	**$ 9,152.00**	**$ 651,692.00**
		DIVISION 06 - WOOD, PLASTICS, COMPOSITES										
			06 10 00 Rough Carpentry									
						Rough carpentry, nailers, wood blocking, curbs, etc. related to roofing work	5,140.00	LF	$ 20,560.00	$ 10,280.00		$ 30,840.00
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						SUB TOTAL			**$ 20,560.00**	**$ 10,280.00**		**$ 30,840.00**
		DIVISION 07 - THERMAL AND MOISTURE PROTECTION										
			07 52 00 Modified Bituminous Membrane Roofing									
						Two ply Modified Bitumen Mineral Surface Roofing System - cold applied						
						Roofing system of sloped roofs B & C (wood plank deck), Cover board mechanically fastened to wood deck, vapor retarder, 6" insulation mechanically fastened, cover board mechanically fastened, modified bit. base sheet cold applied, and modified bit. cap sheet cold applied. Detail 3/A-501	16,064.00	SF	$ 353,408.00	$ 433,728.00		$ 787,136.00
						Roofing system at sloping Roofs B & C interior gutter. Cover board mechanically fastened to wood deck, vapor retarder, tapered insulation mechanically fastened, cover board mechanically fastened, modified bit. base sheet cold applied, and modified bit. cap sheet cold applied cap sheet transition to PMMA flashing membrane at the interior gutter. Detail 7/A-502	3,628.00	SF	$ 79,816.00	$ 97,956.00		$ 177,772.00
						Roofing system at Roofs E & F. Cover board mechanically fastened to wood deck, vapor retarder, 2" insulation mechanically fastened, cover board mechanically fastened, modified bit. base sheet cold applied, and modified bit. cap sheet cold applied. Detail 2/A-501	9,897.00	SF	$ 217,734.00	$ 267,219.00		$ 484,953.00
						Roofing system at Roofs D & G. Vapor retarder, 6" insulation (1/4" per foot) mechanically fastened to concrete deck, cover board mechanically fastened, modified bit. base sheet cold applied, and modified bit. cap sheet cold applied. Detail 1/A-501	3,351.00	SF	$ 73,722.00	$ 90,477.00		$ 164,199.00
						Roofing system at Roof H. Modified bit. base sheet cold applied, and reinforced PMMA cap sheet. Detail 4/A-501	182.00	SF	$ 2,730.00	$ 3,276.00		$ 6,006.00
						Roofing system at Roof transition between H & G. PT wood blocking cut at slope, vapor retarder, 6" tapered insulation (1/4" per f	20.00	SF	$ 500.00	$ 540.00		$ 1,040.00
						Roofing membrane at vertical rising walls. Cover board, mechanically fastened, vapor retarder, 2" rigid insulation cold adhered, cover board cold adhered, modified bit.base sheet cold applied, modified bit. cap sheet cold applied up vertical surface. Detail 6/A-501	915.00	SF	$ 20,130.00	$ 24,705.00		$ 44,835.00
						Roofing membrane at parapet walls Roofs B & C. Cover board cold adhered, modified bit. cap sheet, PMMA flashing membrane. Detail 7/A-502	1,484.00	SF	$ 22,260.00	$ 26,712.00		$ 48,972.00
						Concrete splash block 12" x 24" x 3"	14.00	EA	$ 2,800.00	$ 1,400.00		$ 4,200.00
						Curb extension at exhaust fan. Extend the existing curb by minimum 6" or as required to provide minimum 12" for the curb height.	2.00	EA	$ 2,000.00	$ 4,000.00		$ 6,000.00
			07 62 00 Sheet Metal Flashing and Trim									
						Tin/Zinc coated copper copings at roof B and C. Detail 7/A-502	922.00	LF	$ 55,320.00	$ 27,660.00		$ 82,980.00
						Metal copings at roof E, below camelback coping. Detail 1/A-504	147.00	LF	$ 8,820.00	$ 4,410.00		$ 13,230.00
						Counterflashing assembly at clerestory, cut existing flashing, stl. st. term bar, sheet metal counterflashing hooked into hemmed edge with 2" wide sheet metal cleats at 12" oc. Detail 9/A-501	1,019.00	LF	$ 35,665.00	$ 25,475.00		$ 61,140.00
						Roof edge fascia, Detail 2/A-502	203.00	LF	$ 7,105.00	$ 5,075.00		$ 12,180.00

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						Roof G gutter, Detail 3/A-502	26.00	LF	$ 3,120.00	$ 1,040.00		$ 4,160.00
						Remove and replace lower portion of leader/downspout (24 ga., 4" x 6" x 2' high) including replacement of downspout hanger, Detail 6/A-503	56.00	LF	$ 4,480.00	$ 2,240.00		$ 6,720.00
						Roof drain flashing. Detail 7/A-501	18.00	EA	$ 8,100.00	$ 6,300.00		$ 14,400.00
						Flashing at vent stack	17.00	EA	$ 2,550.00	$ 2,550.00		$ 5,100.00
						Flashing at ductwork support posts	40.00	EA	$ 6,000.00	$ 6,000.00		$ 12,000.00
						Flashing at dunnage posts at roof	24.00	EA	$ 8,400.00	$ 8,400.00		$ 16,800.00
						Flashing at dunnage posts at parapet wall	6.00	EA	$ 2,100.00	$ 2,100.00		$ 4,200.00
						PMMA flashing at splash blocks to roof drain (24" x 17'6" on slope of roof) det.6/A-503	420.00	SF	$ 6,300.00	$ 6,300.00		$ 12,600.00
						Base flashing at curbs, hatches, equipment rails, etc.	180.00	LF	$ 3,600.00	$ 2,700.00		$ 6,300.00
			07 72 33 Roof Hatches									
						New roof hatch with new curbs	2.00	EA	$ 9,000.00	$ 5,974.00		$ 14,974.00
						Re-install smoke hatch with new elevated curbs	2.00	EA	$ 2,000.00	$ 6,000.00		$ 8,000.00
			07 84 13 Penetration Firestopping									
						Penetration firestopping	310.00	EA	$ 8,060.00	$ 6,200.00		$ 14,260.00
			07 92 00 Joint Sealants									
						Joint Sealants	2,100.00	LF	$ 6,300.00	$ 6,300.00		$ 12,600.00
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						SUB TOTAL			**$ 952,020.00**	**$ 1,074,737.00**		**$ 2,026,757.00**
		DIVISION 09 - FINISHES										
			09 01 20.91 Plaster Restoration									
						Walls						
						Mock-up: Plastering, trowel finish for nontextured paint finishes - incl.w/09 23 00						
						Repair of interior plaster wall finishes (100% of wall area) - info	1,462.00	SF	$ 11,696.00	$ 20,468.00		$ 32,164.00
			09 23 00 Gypsum Plastering									
						Remove and replace plaster wall	1,462.00	SF	$ 11,696.00	$ 20,468.00		$ 32,164.00
						Remove and replace plaster ceiling to pemit installation of deck mounted handrails at Type 03 rails	627.00	SF	$ 5,016.00	$ 9,405.00		$ 14,421.00
						Remove and replace interior plaster ceiling A301, Note #4/S-100 including paint	1,580.00	SF	$ 15,800.00	$ 25,280.00		$ 41,080.00

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						Included with 09 23 00						
			09 91 00 Painting									
						Paint wood ceiling - sloping; Prep wood ceiling area, clean and sand wood planks, clean and restore existing piping that crosses wood plank ceiling. Protect sprinkler pipes, fire alarm devices, Temporary remove and store light fixtures, conduits, junction boxes, wires, motors, etc.,	4,783.00	SF	$ 38,264.00	$ 66,962.00		$ 105,226.00
						Paint wood ceiling - flat; Prep wood ceiling area, clean and sand wood planks, clean and restore existing piping that crosses wood plank ceiling. Protect sprinkler pipes, fire alarm devices, Temporary remove and store light fixtures, conduits, junction boxes, wires, motors, etc.,	862.00	SF	$ 6,896.00	$ 12,068.00		$ 18,964.00
						Patch and paint concrete ceiling to match existing finish, clean and restore existing piping. Protect sprinkler pipes, fire alarm devices, Temporary remove and store light fixtures, conduits, junction boxes, wires, motors, etc.,	1,217.00	SF	$ 7,302.00	$ 12,170.00		$ 19,472.00
						Repaint all roof dunnage steel with rust inhibiting paint including prepping surface	909.00	LF	$ 27,270.00	$ 54,540.00		$ 81,810.00
						Paint walls	1,462.00	SF	$ 5,848.00	$ 8,772.00		$ 14,620.00
						Paint at window opening frames	13.00	EA	$ 1,989.00	$ 3,900.00		$ 5,889.00
						Mockups - included with each paint system						
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						SUB TOTAL			**$ 131,777.00**	**$ 234,033.00**		**$ 365,810.00**
		DIVISION 22 - PLUMBING										
			22 00 00 Plumbing									
						Included below						
			22 05 00. 10 Escutcheons for plumbing Piping									
						Remove existing roof drain	17.00	EA	$ 510.00	$ 4,250.00		$ 4,760.00
						Cut and temporary cap storm water pipe	17.00	EA	$ 1,700.00	$ 1,700.00		$ 3,400.00
						Carting and disposal	6.00	HR		$ 1,500.00		$ 1,500.00
						Extend the existing VTR 24" above the finish roof	17.00	EA	$ 6,800.00	$ 8,500.00		$ 15,300.00
						Core-drilling / cutting / patching and fire stopping	1.00	JOB	$ 300.00	$ 1,000.00		$ 1,300.00
						Inspect, snake and clean all leaders storm system before & after roof removal	17.00	EA	$ 850.00	$ 3,400.00		$ 4,250.00
						Shop co-ordination drawings - with General Requirements						
						Material distribution	6.00	HR		$ 1,500.00		$ 1,500.00
						Coordination with other trades - with General Requirements						
						Sleeve and sleeve seal	1.00	EA	$ 200.00	$ 300.00		$ 500.00
			22 05 29 Hangers and Supports for Plumbing Piping and Equipment									
						with 22 14 13						

Department of Design and Construction

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			22 07 19 Plumbing Piping Insulation									
						Storm water pipe insulation	80.00	LF	$ 4,000.00	$ 6,000.00		$ 10,000.00
			22 14 13 Facility Storm Drainage Piping									
						4" dia pipe (Cast iron, no hub) / fittings / supports	80.00	LF	$ 4,000.00	$ 8,000.00		$ 12,000.00
						4" clean out (tee and plug)	1.00	EA	$ 800.00	$ 1,000.00		$ 1,800.00
						Tie-in storm water pipe	18.00	EA	$ 1,800.00	$ 3,600.00		$ 5,400.00
						Associated pipe (Cast iron, no hub) with (1) elbow @ Replaced roof drain 5" dia	17.00	EA	$ 11,050.00	$ 9,350.00		$ 20,400.00
			22 14 26 Facility Storm Drains									
						Roof drain 4" dia	1.00	EA	$ 2,500.00	$ 1,500.00		$ 4,000.00
						Roof drain 5" dia	17.00	EA	$ 42,500.00	$ 31,110.00		$ 73,610.00
						Testing drains	1.00	HR	$ 2,000.00	$ 7,000.00		$ 9,000.00
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						SUB TOTAL			**$ 79,010.00**	**$ 89,710.00**		**$ 168,720.00**
		DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)										
			23 05 00 Common Work Results for HVAC									
						Demolition:						
						AHU unit - disconnect, remove and store in safe location	2.00	EA	$ 12,000.00	$ 30,000.00	$ 20,000.00	$ 62,000.00
						RTU unit (100 tons) - disconnect only	2.00	EA	$ 1,200.00	$ 12,000.00		$ 13,200.00
						ACCU unit - disconnect, remove and store in safe location	15.00	EA	$ 4,500.00	$ 15,000.00	$ 7,500.00	$ 27,000.00
						Fan - disconnect, remove and store in safe location	2.00	EA	$ 1,200.00	$ 2,400.00		$ 3,600.00
						RHSP - disconnect, remove and store in safe location	2.00	EA	$ 3,000.00	$ 5,000.00		$ 8,000.00
						Remove existing ductwork	9,660.00	LB	$ 9,660.00	$ 24,150.00	$ 9,645.00	$ 43,455.00
						Disconnect and temporary cap duct	1.00	JOB	$ 1,000.00	$ 3,000.00		$ 4,000.00
						Remove existing 5" dia CHWS/R pipe	160.00	LF	$ 960.00	$ 4,800.00		$ 5,760.00
						Remove existing refrigerant pipe	240.00	LF	$ 1,440.00	$ 16,800.00		$ 18,240.00
						Cut and cap pipe	1.00	JOB	$ 2,000.00	$ 3,000.00		$ 5,000.00
						Rigging, carting and disposal - included with General Requirements						
						New work:						

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						Reinstall AHU unit after roof renovation	2.00	EA	$ 20,000.00	$ 50,000.00	$ 10,000.00	$ 80,000.00
						Reinstall RTU unit after roof renovation	2.00	EA	$ 24,000.00	$ 60,000.00		$ 84,000.00
						Reinstall fan after roof renovation	2.00	EA	$ 6,000.00	$ 10,000.00		$ 16,000.00
						Reinstall RHSP after roof renovation	2.00	EA	$ 6,000.00	$ 10,000.00		$ 16,000.00
						Test AHU and RTU prior to demo work and after completion (fire alarm system)	4.00	EA	$ 6,000.00	$ 12,000.00		$ 18,000.00
						Other:						
						Commissioning - prior to start demo and after reinstallation - included with General Requirements						
						Equipment handling and material distribution	200.00	HR	$ 1,200.00	$ 28,000.00		$ 29,200.00
						Coordination with other trades - included with General Requirements						
			23 05 17 Sleeves and Sleeve Seals for HVAC Piping									
						Sleeves and sleeve seals for HVAC piping	1.00	JOB	$ 1,500.00	$ 3,000.00		$ 4,500.00
			23 05 23 General-Duty Valves for HVAC Piping									
						Valves	1.00	JOB	$ 1,500.00	$ 4,500.00		$ 6,000.00
			23 05 29 Hangers and Supports for HVAC Piping and Equipment									
						Equipment, duct and pipe supports	1.00	JOB	$ 6,000.00	$ 12,000.00		$ 18,000.00
			23 05 48.13 Vibration Controls for HVAC									
						Vibration Isolation	1.00	JOB	$ 2,500.00	$ 3,500.00		$ 6,000.00
			23 05 53 Identification for HVAC Piping and Equipment									
						Tag AHU and ACCU w/associated piping, control wires and etc. for indentification before removal and after reinstallation	1.00	JOB	$ 2,500.00	$ 3,500.00		$ 6,000.00
			23 05 93 Testing, Adjusting, and Balancing for HVAC									
						Test AHU and RTU prior to start demolition work	4.00	EA	$ 1,000.00	$ 4,800.00		$ 5,800.00
						Pressure and vacuum test ACCU pipes prior to start demolition work and after reinstallation	15.00	EA	$ 4,500.00	$ 18,000.00		$ 22,500.00
						Testing and balance AHU and RTU after renovation	4.00	EA	$ 2,400.00	$ 4,800.00		$ 7,200.00
						Testing and balance of new ductwork	32.00	HR	$ 3,200.00	$ 6,400.00		$ 9,600.00
			23 07 13 Duct Insulation									
						Duct insulation, 2" th. with weather proof jacket @ Outside duct	7,600.00	SF	$ 83,600.00	$ 182,400.00		$ 266,000.00
			23 07 19 HVAC Piping Insulation									

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						5" dia CHWS/R pipe insulation	160.00	LF	$ 1,920.00	$ 4,800.00		$ 6,720.00
						Refrigerant pipe insulation	340.00	LF	$ 4,080.00	$ 10,880.00		$ 14,960.00
			23 09 00 Instrumentation and Control for HVAC									
						Air handling unit (points)	40.00	EA	$ 1,400.00	$ 8,000.00		$ 9,400.00
						Roof top unit (points)	10.00	EA	$ 350.00	$ 2,000.00		$ 2,350.00
						Air cooled condensing unit (points)	15.00	EA	$ 525.00	$ 3,000.00		$ 3,525.00
			23 21 13 Hydronic Piping									
						5" dia CHWS/R pipe (Black steel, Sch-40) / fittings / supports	160.00	LF	$ 4,800.00	$ 32,000.00		$ 36,800.00
						Tie-in 5" dia CHWS/R pipe	4.00	EA	$ 8,000.00	$ 22,000.00		$ 30,000.00
			23 21 16 Hydronic Piping Specialties									
						Hydronic piping specialties	1.00	JOB	$ 2,000.00	$ 3,000.00		$ 5,000.00
			23 23 00 Refrigerant Piping									
						Refrigerant pipe / fittings / supports	340.00	LF	$ 13,600.00	$ 57,800.00		$ 71,400.00
						Tie-in refrigerant pipe	30.00	EA	$ 3,600.00	$ 16,500.00		$ 20,100.00
						Reclaim refrigerant from ACCU	1.00	JOB	$ 1,500.00	$ 5,500.00		$ 7,000.00
						Refrigerant charge (50lbs/ACCU)	750.00	LB	$ 7,500.00	$ 11,250.00		$ 18,750.00
			23 31 13 Metal Ducts									
						Galvanized steel ductwork	11,600.00	LB	$ 69,600.00	$ 208,800.00		$ 278,400.00
						Tie-in duct	1.00	JOB	$ 1,000.00	$ 2,500.00		$ 3,500.00
			23 33 00 Air Duct Accessories									
						Smoke damper with access door 95"x35"	2.00	EA	$ 2,400.00	$ 6,000.00		$ 8,400.00
						Smoke damper with access door 87"x35"	2.00	EA	$ 2,000.00	$ 6,000.00		$ 8,000.00
						Motorized damper with access door 50"x50"	2.00	EA	$ 2,000.00	$ 4,000.00		$ 6,000.00
						Duct smoke detector housing - install only	4.00	EA	$ 440.00	$ 2,400.00		$ 2,840.00
			23 81 26 Split-System Air-Conditioners									
						Reinstall ACCU unit after renovation	15.00	EA	$ 22,500.00	$ 27,300.00		$ 49,800.00
												$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

FMS/Project ID: HH112FTRF

Project Name: Fort Washington Armory Roof Replacement/HVAC Upgrade (Large GC PQL)

Name of the Bidder: Zaman Construction Corp.

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Vendor Quote (Yes/ No)	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
		copy above cell and insert copied cell above the row										
						SUB TOTAL			$ 358,075.00	$ 962,780.00	$ 47,145.00	$ 1,368,000.00
		DIVISION 26 - ELECTRICAL										
			26 05 00 Common Work Results for Electrical									
						Test all motors for phase rotation before disconnecting and after reconnecting equipment	1.00	JOB	$ 10,000.00	$ 75,000.00	$ 2,000.00	$ 87,000.00
						Temporary disconnect and remove ceiling mounted lighting fixtures, power supply, controls and FA system devices. Reinstall after completion of ceiling replacement. Reconnect existing branch circuits. Check and test	1.00	JOB	$ 2,000.00	$ 15,000.00	$ 2,000.00	$ 19,000.00
						Disconnect/reconnect power to MEP equipment	10.00	EA	$ 500.00	$ 25,000.00		$ 25,500.00
						Disconnect/reconnect power to MEP equipment	2.00	EA	$ 200.00	$ 12,000.00		$ 12,200.00
						Upon completion of roof work, remove protection from associated electrical equipment and devices.	1.00	JOB		$ 6,000.00		$ 6,000.00
						Shutdown/switchover	1.00	JOB		$ 7,500.00		$ 7,500.00
						Temporary power and light (with General Requirements)						
						Cutting/patching	1.00	JOB		$ 8,000.00		$ 8,000.00
						Fire Alarm System						
						Scope of work based on drawing FA-011.00 and FA-101.00 dated 05/13/24						
						Remove/reinstall existing:						
						Fire smoke damper	8.00	EA	$ 800.00	$ 12,000.00		$ 12,800.00
						Duct detector	8.00	EA	$ 640.00	$ 12,000.00		$ 12,640.00
						Smoke detector	8.00	EA	$ 800.00	$ 14,400.00		$ 15,200.00
						Control module	8.00	EA	$ 800.00	$ 16,000.00		$ 16,800.00
						Monitoring module	12.00	EA	$ 600.00	$ 18,000.00		$ 18,600.00
						Relay	4.00	EA	$ 800.00	$ 24,000.00		$ 24,800.00
						Splice box, WP	2.00	EA	$ 200.00	$ 8,000.00		$ 8,200.00
						Extend Existing:						
						3/4" RGS	480.00	LF	$ 4,800.00	$ 24,000.00	$ 480.00	$ 29,280.00
						# 14/2 FPLP	480.00	LF	$ 960.00	$ 16,800.00	$ 480.00	$ 18,240.00
						Tie-in to system/testing/programming/fees	1.00	HR		$ 3,110.00		$ 3,110.00
			26 05 19 Low-Voltage Electrical Power Conductors and Cables									
						# 1/0 wire (allow for extension)	120.00	LF	$ 3,000.00	$ 7,800.00		$ 10,800.00
						# 6 wire (allow for extension)	540.00	LF	$ 1,080.00	$ 16,200.00		$ 17,280.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

FMS/Project ID: HH112FTRF

Project Name: Fort Washington Armory Roof Replacement/HVAC Upgrade (Large GC PQL)

Name of the Bidder: Zaman Construction Corp.

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Vendor Quote (Yes/ No)	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
						# 10 wire (note 9)	600.00	LF	$ 1,200.00	$ 18,000.00		$ 19,200.00
			26 05 26 Grounding and Bonding for Electrical Systems									
						Grounding - included with other trade items	1.00	JOB	$ 2,200.00	$ 16,000.00		$ 18,200.00
			26 05 29 Hangers and Supports for Electrical Systems									
						Hangers and support - included with other trade items	1.00	JOB	$ 4,500.00	$ 12,000.00		$ 16,500.00
			26 05 33 Raceway and Boxes for Electrical Systems									
						3" RGS (Roof Electrical plan; allow for existing conduit extension)	130.00	LF	$ 4,550.00	$ 15,600.00		$ 20,150.00
						2" RGS (Roof Electrical plan; allow for existing conduit extension)	300.00	LF	$ 9,000.00	$ 19,500.00		$ 28,500.00
						1 1/4" RGS (allow for existing conduit extension)	180.00	LF	$ 3,600.00	$ 15,300.00		$ 18,900.00
						3/4" RGS (note 9)	200.00	LF	$ 2,000.00	$ 15,000.00		$ 17,000.00
						NEMA 3R junction box (notes 1, 6)	12.00	EA	$ 9,600.00	$ 4,200.00		$ 13,800.00
						NEMA 3R junction box 1-gang (note 9)	30.00	EA	$ 6,000.00	$ 2,100.00		$ 8,100.00
			26 05 44 Sleeves and Sleeve Seals for Electrical Raceways and Cabling									
						Sleeves/firestopping	1.00	JOB	$ 500.00	$ 6,000.00		$ 6,500.00
			26 05 53 Identification for Electrical Systems									
						Tag all wires/cables on both ends before disconnecting of all equipment, devices, outlets and boxes	1.00	JOB	$ 200.00	$ 7,000.00		$ 7,200.00
			26 27 26 Wiring Devices									
						GFI duplex receptacle, WP	5.00	EA	$ 500.00	$ 7,500.00		$ 8,000.00
			26 28 13 Fuses									
						Remove/reinstall existing 60 Amp NEMA 3R disconnect switch	8.00	EA	$ 2,000.00	$ 14,400.00		$ 16,400.00
						Remove/reinstall existing 200 Amp NEMA 3R disconnect switch	2.00	EA	$ 4,000.00	$ 7,000.00		$ 11,000.00
						30 Amp NEMA 3R disconnect switch	2.00	EA	$ 600.00	$ 3,000.00		$ 3,600.00
			26 28 16 Enclosed Switches and Circuit Breakers									
						- included with other trade items						
												$ -
		copy above cell and insert copied cell above the row										
						SUB TOTAL			**$ 77,630.00**	**$ 483,410.00**	**$ 4,960.00**	**$ 566,000.00**
		DIVISION 28 - ELECTRONIC SAFETY AND SECURITY										
			28 46 20 Fire Alarm									

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

FMS/Project ID: HH112FTRF

Project Name: Fort Washington Armory Roof Replacement/HVAC Upgrade (Large GC PQL)

Name of the Bidder: Zaman Construction Corp.

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Vendor Quote (Yes/ No)	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
						Prior unmounting devices, test and check devices for proper operation and functioning	16.00	HRS		$ 4,480.00	$ 800.00	$ 5,280.00
						Relocate existing fire smoke damper	8.00	EA	$ 640.00	$ 6,000.00		$ 6,640.00
						Relocate existing duct mounted smoke detector	8.00	EA	$ 640.00	$ 5,200.00		$ 5,840.00
						3/4" RGS	480.00	LF	$ 5,760.00	$ 12,480.00		$ 18,240.00
						# 12 wire	960.00	LF	$ 1,920.00	$ 6,720.00		$ 8,640.00
						Tie-in to existing system/re-programming/testing/engineering fees	16.00	HRS		$ 4,160.00	$ 800.00	$ 4,960.00
												$ -
		copy above cell and insert copied cell above the row										
						SUB TOTAL			**$ 8,960.00**	**$ 39,040.00**	**$ 1,600.00**	**$ 49,600.00**
								Hard Cost:	**$ 2,774,824.00**	**$ 4,148,356.00**	**$ 62,857.00**	**$ 6,986,037.00**
								Hard Cost Summary(Including General Requirement):				**$ 9,610,037.00**

Note:

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

FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS. That we, Zaman Construction Corp.
97-53 85th Street,
Ozone Park, NY 11416

hereinafter referred to as the "Principal", and
Endurance Assurance Corporation
4 Manhattanville Road
Purchase, NY 10577

hereinafter referred to as the "Surety" 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

Ten Percent (10%) of Amount Bid

($ xxx), 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 submit (or has submitted) to the City the accompanying proposal, hereby made a part hereof, to enter into a contract in writing for

Fort Washington Armory Roof Replacement / HVAC Upgrade 85025B0074-HH112FTRF

NOW, THEREFORE, the conditions of this obligation are such that if the Principal shall not withdraw said Proposal without the consent of the City for a period of forty-five (45) days after the opening of bids and in the event of acceptance of the Principal's Proposal by the City, if the Principal shall:

(a) Within ten (10) days after notification by the City, execute in quadruplicate and deliver to the City all the executed counterparts of the Contract in the form set forth in the Contract Documents, in accordance with the proposal as accepted, and

(b) Furnish a performance bond and separate payment bond, as may be required by the City, for the faithful performance and proper fulfillment of such Contract, which bonds shall be satisfactory in all respects to the City and shall be executed by good and sufficient sureties, and

(c) In all respects perform the agreement created by the acceptance of said Proposal as provided in the Information for Bidders, bound herewith and made a part hereof, or if the City shall reject the aforesaid Proposal, then this obligation shall be null and void; otherwise to remain in full force and effect.

In the event that the Proposal of the Principal shall be accepted and the Contract be awarded to the Principal the Surety hereunder agrees subject only to the payment by the Principal of the premium therefore, if requested by the City, to write the aforementioned performance and payment bonds in the form set forth in the Contract Documents.

It is expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

There shall be no liability under this bond if, in the event of the acceptance of the Principal's Proposal by the City, either a performance bond or payment bond, or both, shall not be required by the City on or before the 30th day after the date on which the City signs the Contract.

The surety, for the value received, hereby stipulates and agrees that the obligations of the Surety and its bond shall in no way be impaired or affected by any postponements of the date upon which the City will receive or open bids, or by any extensions of the time within which the City may accept the Principal's Proposal, or by any waiver by the City of any of the requirements of the Information for Bidders, and the Surety hereby waives notice of any such postponements, extensions, or waivers.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers the 29 day of September, 2025.

(Seal)

Zaman Construction Corp. (L.S.)

Principal

By: _____

(Seal)

Endurance Assurance Corporation

Surety

By: _____

Pamela Lipkin-Sauertig, Attorney-In-Fact

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of NY County of Queens ss:
On this 29 day of September, before me personally came JAVID MINTO to me known, who, being by me duly sworn, did depose and say that he/she/they resides at

that he/she/they is the President of Zaman Construction Corp.
the corporation described in and which executed the foregoing instrument; that he/she/they 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/she/they signed his name thereto by like order.

RAHMAN
NOTARY P STATE OF NEW YORK
Registra No. 01RA6318032
Qualified in Queens County
Commission Expires 01/20/2027

Notary Public

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/she/they acknowledged to me that he/she/they executed the same as and for the act and deed of said firm.

_____
Notary Public

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/she/they executed the same.

_____
Notary Public

AFFIX ACKNOWLEDGMENTS AND JUSTIFICATION OF SURETIES

SURETY ACKNOWLEDGEMENT

State of **New Jersey**
SS:
County of **Morris**

On this **29th** day of **September , 2025,** before me personally comes **Pamela Lipkin-Sauertig** to me known, who, being by me duly sworn, deposes and says that she is the Attorney-In-Fact of the **Endurance Assurance Corporation** the Corporation described in and which executed the foregoing instrument; that she knows that seal of said Corporation; that the seal affixed to the said instrument is such Corporate seal; that it was so affixed by the order of the Board of Directors of the said Corporation, and that she signed her name thereto by like order.

NICOLE KAETZEL
NOTARY PUBLIC
STATE OF NEW JERSEY
MY COMMISSION EXPIRES APRIL 9, 2030
COMMISSION: #50125852

(Signature and Title of Official Taking Acknowledgement)

SOMPO INTERNATIONAL
INSURANCE

POWER OF ATTORNEY

11921

KNOW ALL BY THESE PRESENTS, that **Endurance Assurance Corporation**, a Delaware corporation, **Endurance American Insurance Company**, a Delaware corporation, **Lexon Insurance Company**, a Texas corporation, and/or **Bond Safeguard Insurance Company**, a South Dakota corporation, each, a "Company" and collectively, "**Sompo International**," do hereby constitute and appoint: **Pamela Lipkin-Sauertig, Robyn Rost** as true and lawful Attorney(s)-In-Fact to make, execute, seal, and deliver for, and on its behalf as surety or co-surety; bonds and undertakings given for any and all purposes, also to execute and deliver on its behalf as aforesaid renewals, extensions, agreements, waivers, consents or stipulations relating to such bonds or undertakings provided, however, that no single bond or undertaking so made, executed and delivered shall obligate the Company for any portion of the penal sum thereof in excess of the sum of **ONE HUNDRED MILLION Dollars ($100,000,000.00).**

Such bonds and undertakings for said purposes, when duly executed by said attorney(s)-in-fact, shall be binding upon the Company as fully and to the same extent as if signed by the President of the Company under its corporate seal attested by its Corporate Secretary.

This appointment is made under and by authority of certain resolutions adopted by the sole shareholder of each Company by unanimous written consent effective the 15th day of June, 2019, a copy of which appears below under the heading entitled "Certificate".

This Power of Attorney is signed and sealed by facsimile under and by authority of the following resolution adopted by the sole shareholder of each Company by unanimous written consent effective the 15th day of June, 2019 and said resolution has not since been revoked, amended or repealed:

RESOLVED, that the signature of an individual named above and the seal of the Company may be affixed to any such power of attorney or any certificate relating thereto by facsimile, and any such power of attorney or certificate bearing such facsimile signature or seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN WITNESS WHEREOF, each Company has caused this instrument to be signed by the following officers, and its corporate seal to be affixed this 15th day of June, 2019.

Endurance Assurance Corporation
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Endurance Assurance Corporation CORPORATE SEAL 2002 DELAWARE

Endurance American Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Endurance American Insurance Company CORPORATE SEAL 1996 DELAWARE

Lexon Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

LEXON INSURANCE COMPANY CORPORATE SEAL MARCH 16, 1964 STATE OF TEXAS

Bond Safeguard Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

BOND SAFEGUARD INSURANCE COMPANY A SOUTH DAKOTA INSURANCE COMPANY

ACKNOWLEDGEMENT

On this 15th day of June, 2019, before me, personally came the above signatories known to me, who being duly sworn, did depose and say that he/they is/are officer of each of the Companies; and that he executed said instrument on behalf of each Company by authority of his office under the by-laws of each Company.

By: Amy Taylor
Amy Taylor, Notary Public – My Commission Expires 3/9/27

AMY TAYLOR STATE OF TENNESSEE NOTARY PUBLIC DAVIDSON COUNTY

CERTIFICATE

I, the undersigned Officer of each Company, DO HEREBY CERTIFY that:

1. That the original power of attorney of which the foregoing is a copy was duly executed on behalf of each Company and has not since been revoked, amended or modified; that the undersigned has compared the foregoing copy thereof with the original power of attorney, and that the same is a true and correct copy of the original power of attorney and of the whole thereof;
2. The following are resolutions which were adopted by the sole shareholder of each Company by unanimous written consent effective June 15, 2019 and said resolutions have not since been revoked, amended or modified:

   "RESOLVED, that each of the individuals named below is authorized to make, execute, seal and deliver for and on behalf of the Company any and all bonds, undertakings or obligations in surety or co-surety with others: RICHARD M. APPEL, BRIAN J. BEGGS, CHRISTOPHER DONELAN, SHARON L. SIMS, CHRISTOPHER L. SPARRO, MARIANNE L. WILBERT

   ; and be it further

   RESOLVED, that each of the individuals named above is authorized to appoint attorneys-in-fact for the purpose of making, executing, sealing and delivering bonds, undertakings or obligations in surety or co-surety for and on behalf of the Company."
3. The undersigned further certifies that the above resolutions are true and correct copies of the resolutions as so recorded and of the whole thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal this 29 day of September, 20 25.

By:
Daniel S. Lurie, Secretary

NOTICE: U. S. TREASURY DEPARTMENT'S OFFICE OF FOREIGN ASSETS CONTROL (OFAC)

No coverage is provided by this Notice nor can it be construed to replace any provisions of any surety bond or other surety coverage provided. This Notice provides information concerning possible impact on your surety coverage due to directives issued by OFAC. **Please read this Notice carefully.**

The Office of Foreign Assets Control (OFAC) administers and enforces sanctions policy, based on Presidential declarations of "national emergency". OFAC has identified and listed numerous foreign agents, front organizations, terrorists, terrorist organizations, and narcotics traffickers as "Specially Designated Nationals and Blocked Persons". This list can be located on the United States Treasury's website – https://www.treasury.gov/resource-center/sanctions/SDN-List.

In accordance with OFAC regulations, if it is determined that you or any other person or entity claiming the benefits of any coverage has violated U.S. sanctions law or is a Specially Designated National and Blocked Person, as identified by OFAC, any coverage will be considered a blocked or frozen contract and all provisions of any coverage provided are immediately subject to OFAC. When a surety bond or other form of surety coverage is considered to be such a blocked or frozen contract, no payments nor premium refunds may be made without authorization from OFAC. Other limitations on the premiums and payments may also apply.

ENDURANCE ASSURANCE CORPORATION
Balance Sheet - Statutory - Basis
December 31, 2024

Assets:		
Bonds	$	9,575,738,600
Preferred stocks		15,965,244
Common stocks		2,974,058,744
Cash, cash equivalents, and short-term investments		380,926,489
Other invested assets		382,161,094
Receivables for securities		7,743,789
Total cash and invested assets		**13,336,593,960**
Agents' balances or uncollected premiums		3,751,103,321
Reinsurance recoverable on loss and loss adjustment expense payments		1,079,426,776
Funds held by or deposited with reinsured companies		146,694,256
Investment income due and accrued		75,551,122
Current federal and foreign income tax recoverable and interest thereon		9,551,514
Net deferred tax asset		201,158,214
Receivables from parent, subsidiaries and affiliates		38,811,391
Other assets		396,387,073
Total admitted assets	$	**19,035,277,627**
Liabilities:		
Loss and loss adjustment expenses	$	7,434,113,469
Reinsurance payable on paid loss and loss adjustment expenses		797,536,780
Commissions payable, contingent commissions and other similar charges		7,067,852
Other expenses		26,564,195
Taxes, licenses and fees (excluding federal and foreign income taxes)		18,927,896
Unearned premiums		2,959,915,954
Advanced premium		9,091,368
Dividends declared and unpaid (stockholders)		430,000,000
Ceded reinsurance premiums payable		1,659,311,317
Funds held by company under reinsurance treaties		155,788,157
Amounts withheld or retained by company for account of others		702,732,322
Remittances and items not allocated		186,045,368
Provision for reinsurance		26,000,766
Payable to parent, subsidiaries and affiliates		234,928,735
Payable for securities		48,893,701
Other liabilities		57,059,433
Total liabilities		**14,753,977,313**
Capital and surplus:		
Common capital stock		5,000,000
Gross paid in and contributed surplus		3,480,137,280
Unassigned funds (surplus)		794,870,512
Aggregate write-ins for special surplus funds		1,292,522
Total capital and surplus		**4,281,300,314**
Total liabilities and capital and surplus	$	**19,035,277,627**

I, Hana Entela, Treasurer of Endurance Assurance Corporation (the "Company") do hereby certify that to the best of my knowledge and belief, the foregoing is a full and true Statutory Statement of Admitted Assets, Liabilities, Capital and Surplus of the Company as of December 31, 2024 prepared in conformity with accounting practices prescribed or permitted by the State of Delaware Department of Insurance. The foregoing statement should not be taken as a complete statement of financial condition of the Company. Such a statement is available upon request at the Company's office located at 4 Manhattanville Road, Purchase, NY 10577.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Company at Purchase, New York.

Hana Entela

Subscribed and sworn to before me this 25th day of March, 2025

State of New York, County of Westchester

Notary Public

Department of Design and Construction

PROJECT ID: **HH112FTRF**

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

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

VOLUME 2 OF 3

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

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

Fort Washington Armory Roof Replacement / HVAC Upgrade

LOCATION: **216 Fort Washington Avenue**
BOROUGH: **Manhattan, NY 10032**
CITY OF NEW YORK

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

Department of Homeless Services

Arquitectonica

Date: **June 2, 2025**

NOTICE TO BIDDERS

Please be advised the Project Labor Agreement (PLA) attached and incorporated in this Invitation for Bids has been extended to apply to contracts let prior to September 30, 2025 including this contract. Other than extending the expiration date, all other terms of the PLA continue to apply in full force and effect.

NOTICE TO BIDDERS

This contract is subject to a new 2020 Project Labor Agreement

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

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

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

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

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

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

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

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

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

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

2020 Citywide Renovation Project Labor Agreement
Frequently Asked Questions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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Building Concrete & Excavating Laborers Local 731
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PROJECT LABOR AGREEMENT
COVERING SPECIFIED
RENOVATION & REHABILITATION
OF CITY OWNED BUILDINGS AND STRUCTURES

2020 – 2024

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

ARTICLE 1 - PREAMBLE

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NOW, THEREFORE, the Parties enter into this Agreement:

SECTION 1. PARTIES TO THE AGREEMENT

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

ARTICLE 2 - GENERAL CONDITIONS

SECTION 1. DEFINITIONS

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

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

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

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

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

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

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

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

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

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

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

SECTION 2. CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE

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

SECTION 3. ENTITIES BOUND & ADMINISTRATION OF AGREEMENT

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

SECTION 4. SUPREMACY CLAUSE

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

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

SECTION 5. LIABILITY

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

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

SECTION 6. THE AGENCY

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

SECTION 7. AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS

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

SECTION 8. SUBCONTRACTING

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

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

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

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

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

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

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

3. Contracts procured on an emergency basis;

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

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

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

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

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

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

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

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

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

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

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

SECTION 2. TIME LIMITATIONS

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

SECTION 3. EXCLUDED EMPLOYEES

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

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

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

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

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

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

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

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

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

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

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

SECTION 4. NON-APPLICATION TO CERTAIN ENTITIES

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

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

ARTICLE 4 - UNION RECOGNITION AND EMPLOYMENT

SECTION 1. PRE-HIRE RECOGNITION

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

SECTION 2. UNION REFERRAL

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

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

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

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

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

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

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

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

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

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

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

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

SECTION 3. NON-DISCRIMINATION IN REFERRALS

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

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

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

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

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

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

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

SECTION 5. CROSS AND QUALIFIED REFERRALS

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

SECTION 6. CRAFT FOREPERSONS AND GENERAL FOREPERSONS

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

SECTION 7. ON CALL REPAIR REFERRALS

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

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

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

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

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

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

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

the contract shall be possible.

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

ARTICLE 5 - UNION REPRESENTATION

SECTION 1. LOCAL UNION REPRESENTATIVE

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

SECTION 2. STEWARDS

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

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

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

SECTION 3. LAYOFF OF A STEWARD

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

ARTICLE 6 - MANAGEMENT'S RIGHTS

SECTION 1. RESERVATION OF RIGHTS

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

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

SECTION 2. MATERIALS, METHODS & EQUIPMENT

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

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

ARTICLE 7 - WORK STOPPAGES AND LOCKOUTS

SECTION 1. NO STRIKES-NO LOCK OUT

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

SECTION 2. DISCHARGE FOR VIOLATION

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

SECTION 3. NOTIFICATION

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

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

SECTION 4. EXPEDITED ARBITRATION

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

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

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

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

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

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

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

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

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

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

SECTION 5. ARBITRATION OF DISCHARGES FOR VIOLATION

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

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

ARTICLE 8 - LABOR MANAGEMENT COMMITTEE

SECTION 1. SUBJECTS

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

SECTION 2. COMPOSITION

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

ARTICLE 9 - GRIEVANCE & ARBITRATION PROCEDURE

SECTION 1. PROCEDURE FOR RESOLUTION OF GRIEVANCES

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

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

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

Step 1:

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

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

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

Step 2:

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

Step 3:

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

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

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

SECTION 2. LIMITATION AS TO RETROACTIVITY

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

SECTION 3. PARTICIPATION BY AGENCY AND/OR CONSTRUCTION MANAGER

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

ARTICLE 10 - JURISDICTIONAL DISPUTES

SECTION 1. NO DISRUPTIONS

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

SECTION 2. ASSIGNMENT

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

SECTION 3. NO INTERFERENCE WITH WORK

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

ARTICLE 11 - WAGES AND BENEFITS

SECTION 1. CLASSIFICATION AND BASE HOURLY RATE

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

SECTION 2. EMPLOYEE BENEFITS

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

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

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

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

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

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

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

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

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

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

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

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

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

SECTION 1. WORK WEEK AND WORKDAY

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

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

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

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

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

SECTION 2. OVERTIME

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

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

SECTION 3. SHIFTS

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

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

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

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

SECTION 4. HOLIDAYS

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

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

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

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

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

SECTION 5. MAKE-UP DAYS

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

SECTION 6. REPORTING PAY

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

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

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

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

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

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

SECTION 7. PAYMENT OF WAGES

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

SECTION 8. EMERGENCY WORK SUSPENSION

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

SECTION 9. INJURY/DISABILITY

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

SECTION 10. TIME KEEPING

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

SECTION 11. MEAL PERIOD

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

SECTION 12. BREAK PERIODS

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

ARTICLE 13 - APPRENTICES AND WORKFORCE DEVELOPMENT

SECTION 1. APPRENTICE RATIOS AND REFERRALS

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

SECTION 2. WORKFORCE DEVELOPMENT

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

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

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

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

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

F. Reporting Requirements:

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

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

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

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

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

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

ARTICLE 14 - SAFETY PROTECTION OF PERSON AND PROPERTY
SECTION 1. SAFETY REQUIREMENTS

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

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

SECTION 2. CONTRACTOR RULES

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

SECTION 3. INSPECTIONS

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

ARTICLE 15 - TEMPORARY SERVICES

SECTION 1.

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

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

ARTICLE 16 - NO DISCRIMINATION
SECTION 1. COOPERATIVE EFFORTS

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

SECTION 2. LANGUAGE OF AGREEMENT

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

ARTICLE 17 - GENERAL TERMS
SECTION 1. PROJECT RULES

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

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

SECTION 2. TOOLS OF THE TRADE

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

SECTION 3. SUPERVISION

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

SECTION 4. TRAVEL ALLOWANCES

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

SECTION 5. FULL WORKDAY

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

SECTION 6. COOPERATION AND WAIVER

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

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

ARTICLE 18 - SAVINGS AND SEPARABILITY

SECTION 1. THIS AGREEMENT

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

SECTION 2. THE BID SPECIFICATIONS

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

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

SECTION 3. NON-LIABILITY

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

SECTION 4. NON-WAIVER

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

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

SECTION 1. CHANGES TO AREA CONTRACTS

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

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

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

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

SECTION 2. LABOR DISPUTES DURING AREA CONTRACT NEGOTIATIONS

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

ARTICLE 20 - WORKERS' COMPENSATION ADR

SECTION 1.

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

ARTICLE 21 - HELMETS TO HARDHATS

SECTION 1.

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

SECTION 2.

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

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

BY: _____
Gary LaBarbera
President

FOR NEW YORK CITY

BY: _____
Dean Fuleihan
First Deputy Mayor

APPROVED AS TO FORM:

_____
ACTING CORPORATION COUNSEL
NEW YORK CITY

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

SCHEDULE "A" - CBAs

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

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

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

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

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

Exhibit A

Project Labor Agreement - Letter of Assent

Dear: Chrisari Then

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 216 Fort Washington Avenue, Manhattan, NY 10032 (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: Local 79

Description of Work: Fort Washington Armory Roof Replacement/HVAC Upgrade

Contract Number(s): HH112FTRF

Dated: 10/03/2025

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

(Signature)

Zaman Construction Corp.
(Name of Contractor or subcontractor)

President
(Authorized Officer & Title)

97-53 85th Street, Ozone Park, NY 11416
(Address)

Phone: (212) 964 0189, Fax: (347) 587 6419
(Phone) (Fax)

Contractor's State License
30644

Sworn to before me this
03 day of October, 2025

Notary Public

MD A RAHMAN
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01RA6318032
Qualified In Queens County
Commission Expires 01/20/2027

Exhibit B

NEW YORK CITY BUILDING AND CONSTRUCTION TRADES COUNCIL STANDARDS OF EXCELLENCE

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

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

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

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

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

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

Exhibit "C" - HireNYC Construction Careers

(August 2020 version)

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

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

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

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

(Zip codes within ~100 mile radius of NYC)

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

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

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

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

(Zip codes within ~100 mile radius of NYC)

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

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

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

(Zip codes within ~100 mile radius of NYC)

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

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

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

(Zip codes within ~100 mile radius of NYC)

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

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

EXHIBIT "D"
MEMORANDUM OF UNDERSTANDING

MEMORANDUM OF UNDERSTANDING, entered into as of _____, between the City of New York ("City") with an office located at City Hall, New York, NY 10007, the Building and Construction Trades Council of Greater New York and Vicinity ("BCTC"), on its behalf and on behalf of its affiliated unions, with its principal place of business located at 350 West 31s[t] Street, New York, NY 10001, and the Building Trade Employers' Association of New York City ("BTEA"), on its behalf and on behalf of its affiliated contractors, with its principal place of business located at 1325 Avenue of the Americas, New York, NY 10019.

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

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

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

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

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

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

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

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

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

1. Scope. This MOU:

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

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

b. Shall terminate on December 31, 2024

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

10. Reporting.

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

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

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

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

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

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

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

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

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

For the City of New York

By: _____

First Deputy Mayor, Dean Fuleihan

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

By: _____

Gary LaBarbera, President

For Building Trades Employers' Association of New York City

By: _____

Louis J. Coletti, President & CEO

SCHEDULE "B" - DRUG AND ALCOHOL POLICY

PREAMBLE

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

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

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

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

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

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

ARTICLE 1 - PARTIES

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

ARTICLE 2-GENERAL CONDITIONS

SECTION 2.1 - SUMMARY

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

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

SECTION 2.2 - REVOCATION OF PROJECT ACCESS PRIVILEGES

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

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

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

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

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

SECTION 2.3 - DEFINITIONS

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

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

Evidential Breath Testing Device (EBT): A device that is used to measure alcohol in the breath and which meets National Highway Traffic Safety Administration's specifications for precision and accuracy.

Laboratory: A laboratory that is SAMHSA (Substance Abuse and Mental Health Services Administration) certified for the testing of drugs.

Medical Review Officer (MRO): A licensed physician responsible for receiving laboratory results generated by an employer's drug testing plan who has knowledge of substance abuse disorders and medical training to interpret and evaluate a donor's confirmed positive test result together with his/her medical history and all other relevant information.

Previous Worker: All individuals whose employment relationship with the contractor, company or organization no longer exists.

Project Site: The construction area for respective Project.

Reasonable Suspicion: When a qualified trade contractor, the Developer or Construction Manager as set forth in Section 3.7, reasonably believes that an individual has violated this Policy. Reasonable suspicion is based upon (1) specific, current, behavioral or performance indicators, (2) the possible manufacture, distribution, consumption or possession of unauthorized drugs, drug paraphernalia, or alcohol, or (3) documented investigation by an agency retained by, or otherwise independent from, the Developer or Construction Manager.

SECTION 2.4 - INCLUDED SUBJECTS

This Policy shall cover all employees of the Owner, Construction Manager and Project

trade contractors, their subcontractors and any other of their respective personnel at any level that are performing any activity at a Project Site, inclusive of managers, superintendents and supervisors, except as specifically excluded by Section 2.5 of this Policy (collectively and singularly, "Project Personnel").

SECTION 2.5 - EXCLUDED SUBJECTS

The following persons are not subject to the provisions of this Policy:

- **A.** Employees and entities engaged in off-site manufacture, modifications, repair, maintenance, assembly, painting, handling or fabrication of components, materials, equipment or machinery;
- **B.** Vendors and employees of vendors engaged on a Project Site in equipment testing, inspection, training, warranty work, or engaged in corrections of defective or nonconforming work, unless such employees are expressly included in the bargaining unit of a local signatory to this Agreement;
- **C.** Employees engaged in ancillary work on a Project which is performed by third parties, such as electric utilities, gas utilities, telephone companies, and railroads, or any other work not constituting Project work;
- **D.** Employees of any governmental authority (state, local or otherwise);
- **E.** Employees and contractors engaged in work on the Project Site as part of due diligence or monitoring, which work is ancillary to Project work; and
- **F.** Emergency responders.

SECTION 2.6 - PRESCRIPTION AND NON-PRESCRIPTION DRUGS

The use of prescription drugs not prescribed directly to Project Personnel is prohibited, including the use of drugs prescribed to a spouse or domestic partner. The use of non-prescription drugs that are sold outside the United States and that contain substances that are illegal or require a prescription in the United States are prohibited, unless prescribed by a licensed physician.

SECTION 2.7 - SEARCHES

In order for the Construction Manager to ensure the safety of Project Personnel and for the Construction Manager to protect its assets, the Construction Manager shall have the right upon good cause (such as reasonable suspicion of a violation of this Policy) to conduct reasonable searches for alcohol, drugs and related paraphernalia anywhere within the boundaries of a Project Site. A search may include any assets owned or leased by any Project Personnel that is on a Project Site, including without limitation, vehicles, lockers, gang boxes, desks and personal property brought onto a Project Site, but excluding personal body searches or physical contact with employees.

ARTICLE 3 - DRUG & ALCOHOL TESTING

SECTION 3.1 - COLLECTION PROCESS

As of the execution date of this PLA, Project Personnel may be required to submit urine samples ("Preliminary Drug Screening") for the purpose of detecting the presence of drugs as part of the random, post-accident or reasonable suspicion testing, in accordance with

chain of custody protocols as established by Substance Abuse and Mental Health Services Administration (SAMHSA), utilizing an instant result test cup for Preliminary Drug Screenings, such testing is to be performed on-site by an independent service provider. The results from the instant result test cup will be considered preliminary. The sample will be sent to a SAMHSA certified testing laboratory for confirmation.

As of the date hereof, all Project Personnel will be required to submit to an Evidential Breath Test (EBT) for the purpose of detecting the presence of alcohol when submitting to random, post-accident or reasonable suspicion testing. Alcohol testing will not be conducted for pre-access testing.

SECTION 3.2 - NEGATIVE PRELIMINARY DRUG SCREENING

Project Personnel with a negative Preliminary Drug Screening will be considered conditionally accepted for Project site access, pending confirming laboratory results. Site access privileges will be revoked if the subsequent laboratory results determine that the sample has tested positive for drugs or that the sample has been adulterated.

SECTION 3.3 POSITIVE PRELIMINARY DRUG SCREENING

If the Preliminary Drug Screening indicates a positive result, the individual will not be allowed access to the Project Site. The sample will be sent to the certified laboratory for analysis and, if applicable, reviewed by the Medical Review Officer (MRO). If the laboratory confirmation results are also positive, the individual will be considered in violation of this Policy and their site access will be revoked for at least 30 days. If the laboratory confirmation results are negative, the Project Personnel's site access will not be revoked.

SECTION 3.4 CONFIRMED POSITIVE TEST RESULTS

A. POSITIVE DRUG TEST

A drug test is considered positive if the test results exceed the limits shown in Exhibit 1, which is attached hereto and incorporated herein by reference. The test will be confirmed through a second analysis process and reviewed by an MRO before results are reported. Project Personnel with confirmed positive drug test results will have their site access revoked. In case of a "false positive" result, any such Personnel shall be entitled to the reimbursement of any wages lost during the suspension caused by any such false positive result.

B. POSITIVE EBT

An EBT is considered positive if the test results exceed .04 BrAC, or as otherwise set forth in Exhibit 1. Project Personnel with a positive alcohol test result will be subject to the remedies set forth in Exhibit 1.

C. REINSTATEMENT OF SITE ACCESS PRIVILEGES

(a) Subject to section 3.4(C)(a) immediately below, if the site access of a Project Personnel has been revoked pursuant to this Policy, then any such person may request that their site access be reinstated after 30 days, provided that all of the following conditions are met to the reasonable satisfaction of the Construction Manager. :

1. The individual has provided proof of wellness from an accredited rehabilitation

facility or has provided proof that treatment isn't needed as attested to by a licensed health care provider specializing in the diagnosis and treatment of alcohol and drug abuse.

2. A current drug and alcohol test is obtained within three (3) days of the request for re-access to the site and proof of a negative test result has been received; and
3. The individual agrees to submit to multiple testing for two (2) full years from the date of gaining re-access to the project, the scheduling of which will be determined at the sole discretion of the Construction Manager. If all of these conditions have been met, the Construction Manager agrees that it will not unreasonably withhold their consent to any such request.

(b) Unlawful possession, concealment, use, purchase, sale, manufacture, dispensation or distribution of illegal drugs or un-prescribed controlled substances on the Project site will subject the Project Personnel Employee to immediate removal from the Project site and shall bar such Project Personnel Employee from returning for a minimum of three (3) months, which return shall, in any event, be subject to the reasonable approval by Construction Manager.

(c) All of the Parties agree that any such Project Personnel will only be entitled to any such reinstatement of site access privileges one time and that any subsequent violation of this Policy will result in the permanent termination of access to the Project Site.

SECTION 3.5 - RANDOM TESTING

A third-party provider designated by the Construction Manager will randomly select by an objective criteria a testing pool for random drug and/or alcohol testing from all Project Personnel with site access cards. Any individual selected for a random drug and/or alcohol test will be required to submit to an Evidential Breath Test (EBT) and/or drug test. Individuals may be tested more than once during any given time period. The Parties acknowledge and agree that an EBT may be required without a drug test and that a drug test may be required without an EBT, as solely determined by the Construction Manager.

If an individual is unable to attend the first scheduled random drug test as a result of being involved in a work-related task, such drug test will be rescheduled and will be completed at or before the conclusion of such employee's then current work shift. If the second drug test is missed for any reason, the incident will be reviewed by the Construction Manager, who shall have the right to terminate the site access privileges of any such Project Personnel until such time as that Project Personnel has complied with this Policy. If the individual refuses to take the test, their access privileges will be immediately terminated for cause.

SECTION 3.6 - POST ACCIDENT TESTING

After each work-related incident or injury requiring the services of a licensed health care provider, all Project Personnel involved with the incident will be required to submit to a drug and/or alcohol test immediately following the incident. In instances where emergency care is necessary, the drug and/or alcohol test shall be obtained by the care facility, if possible, within 24 hours after treatment is rendered. If more than 48 hours have passed before an injury is reported and treated by a licensed health care provider, an alcohol test will not be required.

In addition, any Project Personnel involved in a non-injury related incident at a Project Site

with damages at or in excess of $200 will be required to submit to a drug and/or alcohol test unless:

A. It is determined, after conducting an investigation and interviewing all employees involved and any witnesses, that the employee's performance can be completely discounted as a contributing factor to the incident; or
B. It is determined, after conducting an incident investigation and interviewing all employees and any witnesses that the incident was caused by inadequate equipment or system design, and/or premature failure of equipment or system components.

SECTION 3.7 - REASONABLE SUSPICION TESTING

All Project Personnel will be required to submit to a drug and/or alcohol test when there is reasonable suspicion the individual has violated this policy.

Reasonable suspicion includes, without limitation, the following:

A. Violent or irrational behavior;
B. Emotional or physical unsteadiness;
C. Sensory or motor-skill malfunctions;
D. Slurred speech;
E. The odor of alcohol or drugs on clothing or breath in conjunction with other indicators;
F. Possession of alcohol, unauthorized drugs or drug paraphernalia; or
G. Documented evidence of an independent investigation regarding Project Personnel's consumption of what is reasonably believed to be an alcoholic beverage or drugs in violation of the Project's policies and/or this Policy.

Reasonable suspicion testing may only be ordered by supervisory personnel that: (a) have been trained to recognize the above referenced factors; or (b) have received credible documentary evidence from an independent investigator that a Project Personnel has violated a drug and/or alcohol policy. It is agreed that any certified training program shall satisfy the training requirement.

SECTION 3.8 - PRIVACY CONSIDERATIONS

The Parties agree to use reasonable efforts to conduct any testing pursuant to this Policy in accordance with the privacy concerns of Project Personnel. To address these concerns, the Parties agree that:

1. The testing station(s) shall be screened off, or otherwise closed off from public view.
2. All documents and information regarding the testing, including test results, shall be maintained by the respective custodian(s) of record in accordance with their respective privacy policies, which any Project Personnel shall be entitled to review upon timely request.

3. The Parties agree to make a good faith effort to resolve any other privacy concern of Project Personnel regarding this Policy, provided that any such concerns do not interfere with the purpose of this Policy.

ARTICLE 4 – GRIEVANCE

SECTION 4.1 - REPRESENTED WORKERS

Nothing in this Policy shall restrict a member of a signatory local union from filing a grievance in accordance with the member's collective bargaining agreement or a Project Labor Agreement, provided that the grievance shall be limited to whether the removal of a member for violation of this Policy was conducted in compliance with the terms and conditions set forth herein.

SECTION 4.2 - HOLD HARMLESS

The Construction Manager agrees to hold harmless and indemnify the Union/Council and its representatives from any liability that may be incurred as a result of the Company's Drug and Alcohol Policy to the extent caused by the negligence or intentional misconduct of the Construction Manager.

IN WITNESS WHEREOF the parties have agreed to this Policy as of _____, 20___.

FOR [CONSTRUCTION MANAGER]

By: _____

Name: [INSERT NAME]_____

Title: [INSERT TITLE]_____

FOR GREATER NEW YORK CITY BUILDING TRADES COUNCIL

By: _____

Name: Gary LaBarbera _____

Title: President

EXHIBIT 1

CLASS OF DRUGS TESTED AND THEIR RESPECTIVE CUT-OFF LIMITS

The cut-off limits established are those recommended by the U.S. Department of Health and Human Services in their mandatory Guidelines for Federal Workplace Drug Testing Programs.

Drug Class	Screening Cut-Off Limit (ng/ml)	Confirmation Cut-off Limit (ng/ml)
Amphetamines	1000	500
Benzoylecgonine (Cocaine Metabolite)	300	150
Cannabinoids (THC)	50	15
*Opiates	2000	10
Phencyclidine (PCP)	25	25

Confirmation screening is done by means of GC/MS analysis.

*The GC/MS confirmation for opiates will be for both codeine and morphine separately. If morphine is equal to or greater than 2,000ng/ml then the GC/MS confirmation analysis for 6- acetylmorphine (6-MAM) is at a cut-off level of 10ng/ml.

Alcohol Screening

All Project Personnel will be required to submit to an EBT under the random, post-accident, and reasonable suspicion test arenas, for the purpose of detecting presence of alcohol. If this test supports a positive result for presence of alcohol, the Project Personnel will be considered in violation of this Policy.

If the results of the EBT are:

1. Above 0.001 BrAC, but at or below 0.020 BrAC, a second test will be conducted within approximately 15 minutes.
    - If the second BrAC test is less than the first BrAC, the results will be deemed negative and the Project Personnel may return to work, if there are no other outstanding issues.
- If the second BrAC is increasing, but below 0.04 BrAC, the results will be deemed negative, but the Project Personnel will be sent home for the day and the Construction Manager shall be notified. If a Project Personnel is sent home two times within a six-month period pursuant to this Section I, then any such Project Personnel shall be deemed to have tested positive and will be subject to the applicable remedies set forth in Section 2 below.

2. Above 0.02 BrAC, but below 0.06 BrAC, a second test will be conducted after approximately 15 minutes.

- Notwithstanding anything set forth above to the contrary, a Project Personnel may elect to voluntarily go home for the day instead of taking a second test and the results will be deemed negative, provided that any such Project Personnel may not voluntarily go home more than once within a twelve month period.
- If the second BrAC test is at or below 0.02 BrAC, the results will be deemed negative and the Project Personnel may return to work if there are no other outstanding issues.
- If the second BrAC test is above 0.020, but below 0.06, the results will be deemed positive, the Project Personnel will be sent home for the day and their site access will be revoked for at least five [5] calendar days and until such time as the Project Personnel has been evaluated by an EAP professional skilled in substance abuse and confirmed fit for duty.
- Any Project Personnel who is deemed positive two times within two years pursuant to this Section 2 will have their site access privileges terminated and will be entitled to the limited relief set forth in Section 3 .4(c) of the Policy.

3. At or above .06 BrAC, the Project Personnel will have their site access privileges terminated, after which they will be entitled to the limited relief set forth in Section 3.4(C) of the Policy.

CITY OF NEW YORK

DEPARTMENT OF DESIGN AND CONSTRUCTION

INFORMATION FOR BIDDERS

December 2021

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CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION

INFORMATION FOR BIDDERS

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1. Description and Location of Work

The description and location of the work for which bids are requested are specified in the PASSPort RFx field "Description".

2. Time and Place for Receipt of Bids

Sealed bids shall be received on or before the date and hour specified in the PASSPort RFx, at which time they will be publicly opened and read aloud in the presence of the Commissioner or the Commissioner's or her representative, and any bidders who may desire to be present.

3. Definitions

The definitions set forth in the Procurement Policy Board Rules shall apply to this Invitation For Bids.

4. Invitation For Bids and Contract Documents

(A) Except for titles, sub-titles, headings, running headlines, tables of contents and indices (all of which are printed herein merely for convenience) the following, except for such portions thereof as may be specifically excluded, shall be deemed to be part of the Contract and the Invitation for Bids.

(1) All provisions required by law to be inserted in this Contract, whether actually inserted or not

(2) The Contract Drawings and Specifications

(3) The General Conditions, the General Requirements and the Special Conditions, if any

(4) The Contract

(5) The Information for Bidders; Request for Proposals; Notice of Solicitation and Proposal For Bids; Bid or Proposal, and the Bid Booklet

(6) The Budget Director's Certificate; all Addenda issued prior to the receipt of the bids; the Notice of Award; Performance and Payment Bonds, if required; and the Notice to Proceed with the Work.

(B) For particulars as to this procurement, including quantity and quality of the purchase, extent of the work or labor to be performed, delivery and performance schedule, and any other special instructions, prospective bidders are referred to the Invitation For Bids Documents. A copy of such documents can be obtained in the PASSPort RFx.

5. Pre-Bid Conference

A pre-bid conference shall be held as set forth in the PASSPort RFx. Nothing stated at the pre-bid conference shall change the terms or conditions of the Invitation For Bids Documents, unless a change is made by written amendment as provided in Section 9 below. Failure to attend a mandatory pre-bid conference shall constitute grounds for the rejection of the bid.

6. Agency Contact

Any questions or correspondence relating to this bid solicitation shall be addressed to the Agency Contact person specified in the PASSPort RFx.

7. Bidder's Oath

(A) The bid shall be properly signed by an authorized representative of the bidder and the bid shall be verified by the written oath of the authorized representative who signed the bid, that the several matters stated and information furnished therein are in all aspects true.

(B) A materially false statement willfully or fraudulently made in connection with the bid or any of the forms completed and submitted with the bid may result in the termination of any Contract between the City and the Bidder. As a result, the Bidder may be barred from participating in future City contracts as well as be subject to possible criminal prosecution.

8. Examination and Viewing of Site, Consideration of Other Sources of Information and Changed Conditions

(A) Pre-Bidding (Investigation) Viewing of Site - Bidders must carefully view and examine the site of the proposed work, as well as its adjacent area, and seek other usual sources of information, for they will be conclusively presumed to have full knowledge of any and all conditions on, about or above the site relating to or affecting in any way the performance of the work to be done under the Contract which were or should have been indicated to a reasonably prudent bidder. To arrange a date for visiting the work site, bidders are to contact the Agency Contact person specified in The PASSPort RFx.

(B) Should the contractor encounter during the progress of the work subsurface conditions at the site materially differing from any shown on the Contract Drawings or indicated in the Specifications or such subsurface conditions as could not reasonably have been anticipated by the contractor and were not anticipated by the City, which conditions will materially affect the cost of the work to be done under the Contract, the attention of the Commissioner must be called immediately to such conditions before they are disturbed. The Commissioner shall thereupon promptly investigate the conditions. If the Commissioner finds that they do so materially differ, or that they could not reasonably have been anticipated by the contractor and were not anticipated by the City, the Contract may be modified with the Commissioner's written approval.

9. Examination of Proposed Contract

(A) Request for Interpretation or Correction: Prospective bidders must examine the Contract Documents carefully and before bidding must request the Commissioner in writing for an interpretation or correction of every patent ambiguity, inconsistency or error therein which should have been discovered by a reasonably prudent bidder. Such interpretation or correction, as well as any additional contract provisions the Commissioner may decide to include, will be issued in writing by the Commissioner as an addendum to the Contract, which will be transmitted to each person recorded as having received a copy of the Contract Documents from the Department. Transmission of such addendum will be by mail, e-mail, facsimile or hand delivery. Such addendum will also be posted at the place where the Contract Documents are available for the inspection of prospective bidders. Upon transmission as provided for herein, such addendum shall become a part of the Contract Documents, and binding on all bidders, whether or not actual notice of such addendum is shown.

(B) Only Commissioner's Interpretation or Correction Binding: Only the written interpretation or correction so given by the Commissioner shall be binding, and prospective bidders are warned that no other officer, agent or employee of the City is authorized to give information concerning, or to explain or interpret, the Contract.

(C) Documents given to a subcontractor for the purpose of soliciting the subcontractor's bid shall include either a copy of the bid cover sheet or a separate information sheet setting forth the project name, the Contract number (if available), the contracting agency and the Project's location.

10. Form of Bid

Each bid must be submitted upon the prescribed form and must contain: a) the name, residence and place of business of the person or persons making the same; b) the names of all persons interested therein, and if no other person is so interested, such fact must be distinctly stated; c) a statement to the effect that it is made without any connection with any other person making a bid for the same purpose and that it is in all respects fair and without collusion or fraud; d) a statement that no Council member or other officer or employee or person whose salary is payable in whole or part from the City Treasury is directly or indirectly interested therein or in the supplies, materials or equipment and work or labor to which it relates, or in any portion of the profits thereof; e) a statement that the bidder is not in arrears to the City or to any agency upon a debt or contract or taxes, and is not a defaulter as surety or otherwise upon any obligation to the City to any agency thereof, except as set forth in the bid.

THE BID SHALL BE TYPEWRITTEN OR WRITTEN LEGIBLY IN INK. THE BID SHALL BE SIGNED IN INK. ERASURES OR ALTERATIONS SHALL BE INITIALED BY THE SIGNER IN INK. FAILURE TO CONFORM TO THE REQUIREMENTS OF THIS SECTION 10 SHALL RESULT IN THE REJECTION OF THE BID.

11. Irrevocability of Bid

The prices set forth in the bid cannot be revoked and shall be effective until the award of the Contract, unless the bid is withdrawn as provided for in Sections 15 and 18 below.

12. Acknowledgment of Amendments

The receipt of any amendment to the Contract Documents shall be acknowledged by the bidder in its bid submission.

13. Bid Samples and Descriptive Literature

Bid samples and descriptive literature shall not be submitted by the bidder, unless expressly requested elsewhere in the Contract or Contract Documents. Any unsolicited bid samples or descriptive literature which are submitted shall not be examined or tested and shall not be deemed to vary any of the provisions of this Contract.

14. Proprietary Information/Trade Secrets

(A) The bidder shall identify those portions of the bid which it deems to be confidential, proprietary information or trade secrets, and provide justification why such materials shall not be disclosed by the City. All such materials shall be clearly indicated by stamping the pages on which such information appears, at the top and bottom thereof with the word "Confidential". Such materials stamped "Confidential" must be easily separable from the non-confidential sections of the bid.

(B) All such materials so indicated shall be reviewed by the Agency and any decision not to honor a request for confidentiality shall be communicated in writing to the bidder. For those bids which are unsuccessful, all such confidential materials shall be returned to the bidder. Prices, makes and model or catalog numbers of the items offered, deliveries, and terms of payment shall be publicly available after bid opening, regardless of any designation of confidentiality made by the bidder.

15. Pre-Opening Modification or Withdrawal of Bids

Bids may be modified or withdrawn by written notice received in the office designated in the PASSPort RFx, before the time and date set for the bid opening. If a bid is withdrawn in accordance with this Section, the bid security, if any, shall be returned to the bidder.

16. Bid Evaluation and Award

In accordance with the New York City Charter, the Procurement Policy Board Rules and the terms and conditions of this Invitation For Bids, this Contract shall be awarded, if at all, to the responsible bidder whose bid meets the requirements and evaluation criteria set forth in the Invitation For Bids, and whose bid price is either the most favorable bid price or, if the Invitation For Bids so states, the most favorable evaluated bid price. A bid may not be evaluated for any requirement or criterion that is not disclosed in the Invitation For Bids.

Restriction: No negotiations with any bidder shall be allowed to take place except under the circumstances and in the manner set forth in Section 21. Nothing in this Section shall be deemed to permit a contract award to a bidder submitting a higher quality item than that designated in the Invitation For Bids, if that bid is not also the most favorable bid.

17. Late Bids, Late Withdrawals and Late Modifications

Any bid received at the place designated in the solicitation after the time and date set for receipt of bids is late and shall not be considered. Any request for withdrawal or modification received at the place designated in the solicitation after the time and date set for receipt of bids is late and shall not be considered. The exception to this provision is that a late modification of a successful bid that makes the bid terms more favorable to the City shall be considered at any time it is received.

18. Withdrawal of Bids.

Except as provided for in Section 15, above, a bidder may not withdraw its bid before the expiration of forty-five (45) days after the date of the opening of bids; thereafter, a bidder may withdraw its bid only in writing and in advance of an actual award. If within sixty (60) days after the execution of the Contract, the Commissioner fails to fix the date

for commencement of work by written notice to the bidder, the bidder at the bidder's option, may ask to be relieved of the bidder's obligation to perform the work called for by written notice to the Commissioner. If such notice is given to the Commissioner, and the request to withdraw is granted, the bidder waives all claims in connection with this Contract.

19. Mistake in Bids

(A) Mistake Discovered Before Bid Opening: A bidder may correct mistakes discovered before the time and date set for bid opening by withdrawing or correcting the bid as provided in Section 15 above.

(B) Mistakes Discovered Before Award

(1) In accordance with General Municipal Law (Section 103, subdivision 11), where a unilateral error or mistake is discovered in a bid, such bid may be withdrawn upon written approval of the Agency Chief Contracting Officer if the following conditions are met:

(a) The mistake is known or made known to the agency prior to the awarding of the Contract or within 3 days after the opening of the bid, whichever period is shorter; and

(b) The price bid was based upon an error of such magnitude that enforcement would be unconscionable; and

(c) The bid was submitted in good faith and the bidder submits credible evidence that the mistake was a clerical error as opposed to a judgment error; and

(d) The error in the bid is actually due to an unintentional and substantial arithmetic error or an unintentional omission of a substantial quantity of work, labor, material or services made directly in the compilation of the bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of the original work paper, documents, or materials used in the preparation of the bid sought to be withdrawn; and

(e) It is possible to place the agency in the same position as existed prior to the bid.

(2) Unless otherwise required by law, the sole remedy for a bid mistake in accordance with this Article shall be withdrawal of the bid, and the return of the bid bond or other security, if any, to the bidder. Thereafter, the agency may, in its discretion, award the Contract to the next lowest bidder or rebid the Contract. Any amendment to or reformation of a bid or a Contract to rectify such an error or mistake therein is strictly prohibited.

(3) If the mistake and the intended correct bid are clearly evident on the face of the bid document, the bid shall be corrected to the intended correct bid and may not be withdrawn. Examples of mistakes that may be corrected are typographical errors, errors in extending unit prices, transposition errors and arithmetical errors.

20. Low Tie Bids

(A) When two or more low responsive bids from responsible bidders are identical in price, meeting all the requirements and criteria set forth in the Invitation For Bids, the Agency Chief Contracting Officer will break the tie in the following manner and order of priority:

(1) Award to a certified New York City small, minority or woman-owned business entity bidder;

(2) Award to a New York City bidder;

(3) Award to a certified New York State small, minority or woman-owned business bidder;

(4) Award to a New York State bidder.

(B) If two or more bidders still remain equally eligible after application of paragraph (A) above, award shall be made by a drawing by lot limited to those bidders. The bidders involved shall be invited to attend the drawing. A witness shall be present to verify the drawing and shall certify the results on the bid tabulation sheet.

21. Rejection of Bids

(A) Rejection of Individual Bids: The Agency may reject a bid if:

(1) The bidder fails to furnish any of the information required pursuant to Section 24 or 28 hereof; or if

(2) The bidder is determined to be not responsible pursuant to the Procurement Policy Board Rules; or if

(3) The bid is determined to be non-responsive pursuant to the Procurement Policy Board Rules; or if

(4) The bid, in the opinion of the Agency Chief Contracting Officer, contains unbalanced bid prices and is thus non-responsive, unless the bidder can show that the prices are not unbalanced for the probable required quantity of items, or if the imbalance is corrected pursuant to Section 15.

(B) Rejection of All Bids: The Agency, upon written approval by the Agency Chief Contracting Officer, may reject all bids and may elect to resolicit bids if in its sole opinion it shall deem it in the best interest of the City so to do.

(C) Rejection of All Bids and Negotiation With All Responsible Bidders: The Agency Head may determine that it is appropriate to cancel the Invitation For Bids after bid opening and before award and to complete the acquisition by negotiation. This determination shall be based on one of the following reasons:

(1) All otherwise acceptable bids received are at unreasonable prices, or only one bid is received and the Agency Chief Contracting Officer cannot determine the reasonableness of the bid price, or no responsive bid has been received from a responsible bidder; or

(2) In the judgment of the Agency Chief Contracting Officer, the bids were not independently arrived at in open competition, were collusive, or were submitted in bad faith.

(B) When the Agency has determined that the Invitation for Bids is to be canceled and that use of negotiation is appropriate to complete the acquisition, the contracting officer may negotiate and award the Contract without issuing a new solicitation, subject to the following conditions:

(1) prior notice of the intention to negotiate and a reasonable opportunity to negotiate have been given by the contracting officer to each responsible bidder that submitted a bid in response to the Invitation for Bids;

(2) the negotiated price is the lowest negotiated price offered by a responsible bidder; and

(3) the negotiated price is lower than the lowest rejected bid price of a responsible bidder that submitted a bid in response to the Invitation for Bids.

22. Right to Appeal Determinations of Non-Responsiveness or Non-Responsibility and Right to Protest Solicitations and Award

The bidder has the right to appeal a determination of non-responsiveness or non-responsibility and has the right to protest a solicitation and award. For further information concerning these rights, the bidder is directed to the Procurement Policy Board Rules.

23. Affirmative Action and Equal Employment Opportunity

This Invitation For Bids is subject to applicable provisions of Federal, State and Local Laws and executive orders requiring affirmative action and equal employment opportunity.

24. PASSPort COMPLIANCE

All vendors that intend to do business with the City of New York must complete a disclosure process in order to be considered for a contract. This disclosure process was formerly completed using Vendor Information Exchange System (VENDEX) paper-based forms. The City of New York has moved collection of vendor disclosure information online. In early August 2017, the New York City Mayor's Office of Contract Services (MOCS) launched the Procurement and Sourcing Solutions Portal (PASSPort), a new online procurement system that replaced the paper-VENDEX process. In anticipation of awards, all bidders must create online accounts in the new PASSPort system, and

file all disclosure information using PASSPort. Paper submissions, including certifications of no changes to existing VENDEX packages, will not be accepted in lieu of complete online filings using PASSPort.

All vendors that intend to do business with the City, but specifically those that fall into any of the following categories, are required to enroll:

- Have a pending award with a City Agency; or
- Hold a current contract with a City Agency and have either an expiring VENDEX or expiring Certificate of No Change.

The Department of Design and Construction (DDC) and MOCS hereby notifies all proposers that the PASSPort system is available, and that disclosure filing completion is required prior to any award through this competitive bid.

To enroll in PASSPort and to access the PASSPort website (including online training), please visit www.nyc.gov/passport. Contact MOCS at passport@mocs.nyc.gov for additional information and technical support.

25. Complaints About the Bid Process

The New York City Comptroller is charged with the audit of contracts in New York City. Any vendor who believes that there has been unfairness, favoritism or impropriety in the bid process should inform the Comptroller, Office of Contract Administration, One Centre Street, Room 835, New York, New York; telephone number (212)669-2323.

26. Bid, Performance and Payment Security

(A) Bid Security: Each bid must be accompanied by bid security in an amount and type specified in the PASSPort RFx questionnaire. The bid security shall assure the City of New York of the adherence of the bidder to its proposal, the execution of the Contract, and the furnishing of Performance and Payment Bonds by the bidder, if required in the PASSPort RFx. Bid security shall be returned to the bidder as follows:

(1) Within ten (10) days after the bid opening, the Comptroller will be notified to return the deposits of all but the three (3) lowest bidders. Within five (5) days after the award, the Comptroller will be notified to return the deposits of the remaining two unsuccessful bidders.

(2) Within five (5) days after the execution of the Contract and acceptance of the Contractor's bonds, the Comptroller will be notified to return the bid security of the successful bidder or, if performance and payment bonds are not required, only after the sum retained under Article 21 of the Contract equals the amount of the bid security.

(3) Where all bids are rejected, the Comptroller will be notified to return the deposit of the three (3) lowest bidders at the time of rejection.

(B) Performance and Payment Security: Performance and Payment Security must be provided in an amount and type specified in the PASSPort RFx. The performance and payment security shall be delivered by the contractor prior to or at the time of execution of the Contract. If a contractor fails to deliver the required performance and payment security, its bid security shall be enforced, and an award of Contract may be made to the next lowest responsible and responsive bidder, or the contract may be rebid.

(C) Acceptable Types of Security: Acceptable types of security for bids, performance, and payment shall be limited to the following:

(1) a one-time bond in a form satisfactory to the City;

(2) a bank certified check or money order;

(3) obligations of the City of New York; or

(4) other financial instruments as determined by the Office of Construction in consultation with the Comptroller.

Whenever the successful bidder deposits obligations of the City of New York as performance and payment security, the Comptroller may sell and use the proceeds thereof for any purpose for which the principal or

surety on such bond would be liable under the terms of the Contract. If the money is deposited with the Comptroller, the successful bidder shall not be entitled to receive interest on such money from the City.

(D) Form of Bonds: Security provided in the form of bonds must be prepared on the form of bonds authorized by the City of New York. Forms for bid, performance, and payment bonds are included in the Invitation for Bids Documents. Such bonds must have as surety thereunder such surety company or companies as are: (1) approved by the City of New York; (2) authorized to do business in the State of New York, and (3) approved by the Department of the Treasury of the United States. Premiums for any required bonds must be included in the base bid.

The bidder is advised that submission of a bid bond where the surety on such bond fails to meet the criteria set forth herein, shall result in the rejection of the bid as non-responsive.

The Department of the Treasury of the United States advises that information concerning approved surety companies may be obtained as follows: (1) from the Government Printing Office at 215-364-6465; (2) through the Internet at https://www.fiscal.treasury.gov/surety-bonds/.

(E) Power of Attorney: Attorneys in fact who sign bid, performance, or payment bonds must file with each bond a certified copy of their power of attorney to sign said bonds.

27. Failure to Execute Contract

In the event of failure of the successful bidder to execute the Contract and furnish the required security within ten (10) days after notice of the award of the Contract, the deposit of the successful bidder or so much thereof as shall be applicable to the amount of the award made shall be retained by the City, and the successful bidder shall be liable for and hereby agrees to pay on demand the difference between the price bid and the price for which such Contract shall be subsequently awarded, including the cost of any required reletting and less the amount of such deposit. No plea of mistake in such accepted bid shall be available to the bidder for the recovery of the deposit or as a defense to any action based upon such accepted bid. Further, should the bidder's failure to comply with this Section cause any funding agency, body or group (Federal, State, City, Public, Private, etc.) to terminate, cancel or reduce the funding on this project, the bidder in such event shall be liable also to the City for the amount of actual funding withdrawn by such agency on this project, less the amount of the forfeited deposit.

28. Bidder Responsibilities and Qualifications

(A) Bidders must include with their bids all information necessary for a determination of bidder responsibility, as set forth in the Specifications.

(B) The Agency may require any bidder or prospective bidder to furnish all books of account, records, vouchers, statements or other information concerning the bidder's financial status for examination as may be required by the Agency to ascertain the bidder's responsibility and capability to perform the Contract. If required, a bidder must also submit a sworn statement setting forth such information as the Agency may require concerning present and proposed plant and equipment, the personnel and qualifications of the bidder's working organizations, prior experience and performance record.

(C) Oral Examination on Qualifications: In addition thereto, and when directed by the Agency, the bidder, or a responsible officer, agent or employee of the bidder, must submit to an oral examination to be conducted by the Agency in relation to the bidder's proposed tentative plan and schedule of operations, and such other matters as the Agency may deem necessary in order to determine the bidder's ability and responsibility to perform the work in accordance with the Contract. Each person so examined must sign and verify a stenographic transcript of such examination noting thereon such corrections as such person may desire to make.

(D) If the bidder fails or refuses to supply any of the documents or information set forth in paragraph (B) hereof or fails to comply with any of the requirements thereof, the Agency may reject the bid.

29. Employment Report

In accordance with Executive Order No. 50 (1980) as modified by Executive Order 108 (1986), the filing of a

completed Employment Report (ER) is a requirement of doing business with the City of New York for construction contractors with contracts of $1,000,000 or more and subcontractors with construction subcontracts of $750,000 or more. The required forms and information are included in the PASSPort Vendor Profile.

30. Labor Law Requirements

(A) General: The successful bidder will be required to comply strictly with all Federal, State and local labor laws and regulations.

(B) New York State Labor Law: This Contract is subject to New York State Labor Law Section 220, which requires that construction workers on the site be paid prevailing wages and supplements. The Contractor is reminded that all wage provisions of this Contract will be enforced strictly and failure to comply will be considered when evaluating performance. Noncompliance may result in the contractor being debarred by the City from future contracts. Complaints filed with the Comptroller may result in decisions which may debar a contractor from bidding contracts with any state governmental entity and other political subdivisions.

(C) Records: The Contractor is expected to submit accurate payroll reports and other required documents and verify attendance and job classifications being utilized in compliance with the law, Contract provisions and agency procedures.

31. Insurance

(A) Bidders are advised that the insurance requirements contained herein are regarded as material terms of the Contract. As required by Article 22 of the Contract, the contractor must effect and maintain with companies licensed and authorized to do business in the State of New York, the types of insurance set forth therein, when required by and in the amounts set forth in Schedule A of the General Conditions. Such required insurance must be provided from the date the contractor is ordered to commence work and up to the date of final acceptance of all required work.

(B) The contractor must, within ten days of receipt of the notice of award, submit the following insurance documentation: (a) original certificate of insurance for general liability in the amount required by Schedule A of the General Conditions, and (b) original certificates of insurance or other proof of coverage for workers' compensation and disability benefits, as required by Section 57 of the New York State Workers' Compensation Law and Section 220 of the Disability Benefits Law.

32. Lump Sum Contracts

(A) Comparison of Bids: Bids on Lump Sum Contracts will be compared on the basis of the lump sum price bid, adjusted for alternate prices bid, if any.

(B) Lump Sum Bids for "General Construction Work" which include excavation shall include all necessary excavation work defined in the Specifications as being included in the lump sum bid. The bidder shall also bid a unit price for the additional cost of excavating material which is defined in the Specifications as excavation for which additional payment will be made. The total estimated additional cost of removing such material will be taken as the quantity set forth in the Engineer's Estimate multiplied by the unit price bid. This total estimated cost of additional excavation shall be added to the lump sum bid for the General Construction Work for the purpose of comparing bids to determine the low bidder.

(C) Variations from Engineer's Estimate: The Engineer's Estimate of the quantity of excavation for which additional payment will be made is approximate only and is given solely to be used as a uniform basis for the comparison of bids and such estimate is not to be considered as part of this contract. The quantities actually required to complete the contract work may be more or less than the quantities in the Engineer's Estimate and, if so, no action for damages or for loss of profits shall accrue to the contractor by reason thereof.

33. Unit Price Contracts

(A) Comparison of Bids: Bids on Unit Price Contracts will be compared on the basis of a total estimated price,

arrived at by taking the sum of the estimated quantities of such items, in accordance with the Engineer's Estimate of Quantities set forth in the Bid Schedule, multiplied by the corresponding unit prices, and including any lump sum bids on individual items.

(B) Variations from Engineer's Estimate: Bidders are warned that the Engineer's Estimate of Quantities on the various items of work and materials is approximate only, given solely to be used as a uniform basis for the comparison of bids, and is not be considered part of this contract. The quantities actually required to complete the contract work may be less or more than so estimated, and if so, no action for damages or for loss of profits shall accrue to the contractor by reason thereof.

(C) Overruns: The terms and conditions applicable to overruns of unit price items are set forth in Article 26 of the Contract.

34. Excise Tax

Bidders are referred to the Specifications for information on Federal Excise Tax exemptions.

35. Licenses and Permits

The successful bidder will be required to obtain all necessary licenses and permits necessary to perform the work.

36. Multiple Prime Contractors

If more than one prime contractor will be involved on this project, all contractors are required to examine the Invitation for Bid packages for all other parts of the project.

37. Locally Based Enterprise Requirements (LBE)

This Contract is subject to the requirements of Administrative Code, Section 6-108.1, and the regulations promulgated thereunder. No construction contract will be awarded unless and until these requirements have been complied with in their entirety. The bidder is advised of the provisions set forth below, as well as the provisions with respect to the Locally Based Enterprise Program contained in Article 67 of the Contract. The contractor is advised that:

(A) If any portion of the Contract is subcontracted, not less than ten percent of the total dollar amount of the contract shall be awarded to locally based enterprises ("LBEs"); except, where less than ten percent of the total dollar amount of the Contract is subcontracted, such lesser percentage shall be so awarded.

(B) No contractor shall require performance and payment bonds from LBE subcontractors.

(C) No Contract shall be awarded unless the contractor first identifies in its bid:

(1) the percentage, dollar amount and type of work to be subcontracted; and

(2) the percentage, dollar amount and type of work to be subcontracted to LBEs.

(D) Within ten calendar days after notification of low bid, the apparent low bidder shall submit an "LBE Participation Schedule" to the contracting agency. If such schedule does not identify sufficient LBE subcontractors to meet the requirements of Administrative Code Section 6-108.1, the apparent low bidder shall submit documentation of its good faith efforts to meet such requirements.

(1) The "LBE Participation Schedule" shall include:

(a) the name and address of each LBE that will be given a subcontract,

(b) the percentage, dollar amount and type of work to be subcontracted to the LBE, and

(c) the dates when the LBE subcontract work will commence and end.

(2) The following documents shall be attached to the "LBE Participation Schedule":

(a) verification letters from each subcontractor listed in the "LBE Participation Schedule" stating that the LBE will enter into a formal agreement for work,

(b) certification documents of any proposed LBE subcontractor which is not on the LBE certified list, and

(c) copies of the certification letter of any proposed subcontractor which is an LBE.

(3) Documentation of good faith efforts to achieve the required LBE percentage shall include as appropriate but not limited to the following:

(a) attendance at prebid meetings, when scheduled by the agency, to advise bidders of contract requirements;

(b) advertisement where appropriate in general circulation media, trade association publications and small business media of the specific subcontracts that would be at least equal to the percentage goal for LBE utilization specified by the contractor;

(c) written notification to association of small, minority and women contractors soliciting specific subcontractors;

(d) written notification by certified mail to LBE firms that their interest in the contract is solicited for specific work items and their estimated values;

(e) demonstration of efforts made to select portions of the work for performance by LBE firms in order to increase the likelihood of achieving the stated goal;

(f) documented efforts to negotiate with LBE firms for specific subcontracts, including at a minimum:

(i) The names, address and telephone numbers of LBE firms that are contacted;

(ii) A description of the information provided to LBE firms regarding the plans and specifications for portions of the work to be performed;

(iii) Documentation showing that no reasonable price can be obtained from LBE firms;

(iv) A statement of why agreements with LBE firms were not reached;

(g) a statement of the reason for rejecting any LBE firm which the contractor deemed to be unqualified; and

(h) documentation of efforts made to assist the LBE firms contacted that needed assistance in obtaining required insurance.

(E) Unless otherwise waived by the Commissioner with the approval of the Office of Economic and Financial Opportunity, failure of a proposed contractor to provide the information required by paragraphs (C) and (D) above may render the bid non-responsive and the Contract may not be awarded to the bidder. If the contractor states that it will subcontract a specific portion of the work, but can demonstrate despite good faith efforts it cannot achieve its required LBE percentage for subcontracted work until after award of Contract, the Contract may be awarded, subject to a letter of compliance from the contractor stating that it will comply with Administrative Code Section 6-108.1 and subject to approval by the Commissioner. If the contractor has not met its required LBE percentage prior to award, the contractor shall demonstrate that a good faith effort has been made subsequent to award to obtain LBEs on each subcontract until its meets the required percentage.

(F) When a bidder indicates prior to award that no work will be subcontracted, no work may be subcontracted without the prior written approval of the Commissioner, which shall be granted only if the contractor in good faith seeks LBE subcontractors at least six weeks prior to the start of work.

(G) The contractor may not substitute or change any LBE which was identified prior to award of the contract without the written permission of the Commissioner. The contractor shall make a written application to the Commissioner for permission to make such substitution or change, explaining why the contractor needs to change its LBE subcontractor and how the contractor will meet its LBE subcontracting requirement. Copies of such application must be served on the originally identified LBE by certified mail return receipt requested,

as well as the proposed substitute LBE. The Commissioner shall determine whether or not to grant the contractor's request for substitution.

38. Bid Submission Requirements

The Bid Submission Requirements are set forth in the PASSPort RFx.

39. Comptroller's Certificate

This Contract shall not be binding or of any force unless it is registered by the Comptroller in accordance with Section 328 of the City Charter and the Procurement Policy Board Rules. This Contract shall continue in force only after annual appropriation of funds by the City of New York and certification as hereinabove set forth.

40. Procurement Policy Board Rules

This Invitation For Bids is subject to the Rules of the Procurement Policy Board of the City of New York. In the event of a conflict between said Rules and a provision of this Invitation For Bids, the Rules shall take precedence.

41. DDC Safety Requirements

The DDC Safety Requirements apply to the work to be performed pursuant to the Contract. The DDC Safety Requirements are set forth on the following pages.

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CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
SAFETY REQUIREMENTS FOR CONSTRUCTION CONTRACTS

January 2020

THE DDC SAFETY REQUIREMENTS FOR CONSTRUCTION CONTRACTS INCLUDE THE FOLLOWING SECTIONS:

I. POLICY ON SITE SAFETY

II. PURPOSE

III. DEFINITIONS

IV. RESPONSIBILITIES

V. SAFETY QUESTIONNAIRE

VI. SITE SAFETY PLAN

VII. KICK-OFF/PRE-CONSTRUCTION MEETINGS AND SAFETY REVIEW

VIII. EVALUATION DURING WORK IN PROGRESS

IX. SAFETY PERFORMANCE EVALUATION

I. POLICY ON SITE SAFETY

The City of New York Department of Design and Construction (DDC) is committed to a policy of injury and illness prevention and risk management for construction work that will ensure the safety and health of the workers engaged in the projects and the protection of the general public. Therefore, it is DDC's policy that work carried out by Contractors on DDC contracts must, at a minimum, comply with the most current versions of all applicable federal, state and city laws, rules, and regulations, including without limitation:

- Code of Federal Regulations, Title 29, Part 1926 (29 CFR 1926) and applicable Sub-parts of Part 1910 – U.S. Occupational Safety and Health Administration (OSHA);
- Federal Highway Administration – Manual on Uniform Traffic Control Devices (MUTCD);
- New York Codes, Rules and Regulations (NYCRR), Title 12, Part 23 – Protection in Construction, Demolition and Excavation Operations;
- New York Codes, Rules and Regulations (NYCRR), Title 16, Part 753 – Protection of Underground Facilities;
- New York City Administrative Code, Title 28 – New York City Construction Codes;
- Rules of the City of New York, Title 15, Chapter 13 – Rules Pertaining To the Prevention of the Emission of Dust from Construction Related Activities;
- Rules of the City of New York, Title 15, Chapter 28 – Citywide Construction Noise Mitigation;
- Rules of the City of New York, Title 34 Chapter 2 – NYCDOT Highway Rules.

The Contractor will be required to comply with all new and/or revised federal, state and city laws, rules, and regulations, issued during the course of the project, at the expense of the Contractor without any additional costs to the DDC.

II. PURPOSE

The purpose of this policy is to ensure that Contractors perform their work and supervise their employees in accordance with all applicable federal, state and city rules and regulations. Further, Contractors will be expected to minimize or eliminate jobsite and public hazards, through a planning, inspection, auditing and corrective action process. The goal is to control risks so that injuries, illnesses, and accidents to contractors' employees, DDC employees and the general public, as well as damage to city-owned and private property, are reduced to the lowest level feasible.

III. DEFINITIONS

Agency Chief Contracting Officer (ACCO): The ACCO will mean the person delegated authority by the Commissioner to organize and supervise the procurement activity of subordinate Agency staff in conjunction with the City Chief Procurement Officer (CCPO).

Competent Person: As defined by OSHA, an individual who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees or the general public, and who has authorization to take prompt corrective measures to eliminate them. This individual will have completed, at a minimum an authorized 30-hour OSHA Construction Safety Course. The Contractor may be required to provide more than one competent person due to construction operations and based on the number of active work sites.

Construction Safety Auditor: A representative of the Office of Construction Safety who provides inspection and assessment services to enhance health and safety on all DDC construction projects. The activities of the Construction Safety Auditor include performing site audits, reviewing safety plans, reviewing construction permits, drawings, verifying Contractor's compliance with applicable federal, state and city laws, rules, regulations, and DDC Contract Safety Requirements, etc. and rendering technical advice and assistance to DDC Resident Engineers and Project Managers.

Office of Construction Safety: A unit of DDC Safety and Site Support that assesses contractor's safety on DDC jobsites and advises responsible parties of needed corrective actions.

Registered Construction Superintendent: For certain projects, as defined in New York City Construction Codes – Title 28, the contractor will provide a Construction Superintendent registered with the NYC Department of Buildings and responsible for all duties as defined in Chapter 33 of Title 1 of the Rules of the City of New York.

Contractor: For purposes of these Safety Requirements, the term "Contractor" will mean any person or entity that enters into a contract for the performance of construction work on a DDC project. The term "Contractor" will include any person or entity which enters into any of the following types of contracts: (1) a prime construction contract for a specific project, (2) a prime construction contract using the Job Order Contracting System ("JOCS Contract"), and (3) a subcontract with a CM/Builder ("First Tier Subcontract").

Daily Safety Job Briefing: Daily jobsite safety briefings, given to all jobsite personnel at project site by the Contractor before work begins and/or if hazards or potential hazards are discovered while working, with the purpose of discussing the scheduled activities for the day, the hazards related to these activities, activity specific safety procedures, and Job Hazard Analysis associated with the scheduled construction work. Daily jobsite briefings will be documented, available at the jobsite, and will include at a minimum, topics, name and signature of the person conducting the briefing session, names and signatures of attendants, name of the designated competent person, contactor's name, DDC Project ID, date, time, and location.

Director – Office of Construction Safety: Responsible for the operations of the Office of Construction Safety and the DDC Site Safety management programs.

Job Hazard Analysis (JHA): A process of identifying the major job tasks and any potential site-specific hazards that may be present during construction and establishing the means and methods to eliminate or control those hazards. A JHA will be documented, available at the jobsite and will include at a minimum work tasks, being performed, identified hazards, control methods for the identified hazards, contractor's name, DDC Project ID, location, date, name and signature of certifying person. A JHA is a living document that will be re-evaluated and revised to address new hazards and tasks that may develop and will be present at the worksite and produced upon request.

Qualified Person: As defined by OSHA, an individual who, by possession of a recognized degree, certificate, license, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his or her ability to solve problems relating to the subject matter, the work, or the project. Qualified Persons are required under regulation to address issues pertaining, but without limit, to fall protection, scaffold design, maintenance and protection of traffic, and excavation protective system, among others.

Project Site: Those areas indicated in the Contract Documents where the Work is to be performed.

Project Safety Representative: The designated Project Safety Representative will have at a minimum an OSHA 30-hour Construction Safety Course and other safety training applicable to Contractor's/subcontractor's project work. This individual will be responsible to oversee safety performance of the required construction work, conduct documented daily safety inspections, and implement corrective actions to maintain a safe work site. The Project Safety Representative must have sufficient experience and skills necessary to thoroughly understand the health and safety hazards and controls and must have authority to undertake corrective actions. A dedicated full-time Project Safety Representative may be required on large projects and projects deemed by DDC to be particularly high risk. DDC reserves the right to request a dedicated full-time Project Safety Representative for any reason at any time during the course of the project at the expense of the Contractor without any additional costs to the DDC. The full-time Project Safety Representative will be present at the site during all work activities.

Resident Engineer ("RE"): Representative of the Commissioner duly designated by the Commissioner to be his/her representative at the site of the work. The RE may be a consultant retained by DDC, including a Construction Management (CM) or Resident Engineer Inspection (REI) firm. If DDC has retained a CM, REI or other consultant firm to perform management and oversite for the Project (e.g., CM-Builder, CM-Design-Builder, Project Manager, Program Manager), that CM, REI or other consultant is the Resident Engineer for purposes of these Safety Requirements.

Safety Questionnaire: Used by DDC to evaluate Contractor's current and past safety performance. It is required to be completed by all Contractors initially when submitting bids for Construction work, or when being pre-qualified

and updated annually or as requested by the DDC.

Site Safety Manager: For certain projects, as defined in New York City Construction Codes – Title 28, the Contractor will provide a Site Safety Manager with a Site Safety Manager License issued by the New York City Department of Building.

Site Safety Plan: A site-specific safety plan developed by the Contractor for a DDC project. The Site Safety Plan will identify the project work scope, identify hazards associated with the project work and include project specific safety procedures and training appropriate and necessary to complete the work. The Site Safety Plan will be submitted within 30 days from the Award Date or as otherwise directed and is subject to review and acceptance by the Office of Construction Safety prior to the commencement of work at the site.

Unsafe or Unhealthy Condition: A condition that could be potentially hazardous to the health and safety of personnel or the public, and/or damaging to equipment, machinery, property, or the environment.

Weekly Safety Meetings: Weekly jobsite safety meetings, given to all jobsite personnel by Contractor, with the purpose of discussing general safety topics and job specific requirements encountered at the DDC work site. Weekly safety meetings will be documented and will include at a minimum, topics, name and signature of the person conducting the meeting, names and signatures of attendees, contractor's name, DDC Project ID, date, and location.

Work: The construction required by the Contractor's Contract Documents whether completed or partially completed, performed by the Contractor/ subcontractors. Work refers to the furnishing of labor, furnishing and incorporating materials and equipment into the construction and providing any service required by the Contract Documents to fulfill the Contractor's obligation to complete the Project. For the purposes of these Safety Requirements, the term "Work" includes all Utility Interference work (commonly referred to as "Section U", "EP-7", and "Joint Bid" work) performed in association with this Contract.

IV. RESPONSIBILITIES

All persons who manage, perform, and provide support for construction projects will conduct operations in compliance with the requirements identified in this Policy and all applicable governing regulatory agency requirements and guidelines pertaining to safety in construction.

A. Resident Engineer

1. Review and facilitate Contractor(s) Site Safety Plan submittals to DDC for acceptability.
2. Notify the Office of Construction Safety of the commencement of construction work.
3. Develop and implement a training verification process to ensure that all CM/REI, consultant, Contractor, and subcontractor employees are properly trained. Maintain all applicable initial and refresher training records and assures documentation availability on site.
4. Maintain documentation of and attend weekly safety meetings and daily safety job briefings.
5. Assure that Contractor(s) JHA's are current to reflect the work tasks being performed, hazards, and control methods to mitigate the identified hazards. Verify that all employees at the job site are trained on the JHAs and maintain supporting documentation on site.
6. Assure adequate planning for all critical construction activities (crane operation, excavation, confined space entry, etc.) including coordination between Contractor(s) /DDC/ other Agencies as required.
7. Maintain custody of all construction related permits, plans, approvals, drawings, etc., related to the project and assure their availability on site.
8. Recognize, minimize, or eliminate jobsite and public hazards, through required planning, inspection, verification, and corrective action process.
9. Monitor the conditions at the site for conformance with the Contractor's Site Safety Plan, DDC policies, permits, and all applicable regulations and documentation that pertain to construction safety.
10. Notify the Contractor and DDC immediately upon determination of any condition or activity existing which is not in compliance with the Contractor's Site Safety Plan, applicable federal, state or local codes or any

condition that presents a potential risk of injury to the public or workers or possible damage to property. Direct the Contractor to provide such labor, materials, equipment, and supervision to remedy such conditions.

11. Notify the Office of Construction Safety and the ACCO's Insurance and Risk Management Unit of project-related accidents, incidents, and near misses as per DDC's Construction Safety Emergency and Accident Notification and Response Procedure within two (2) hours.
12. In case of an accident, incident, or near miss, RE is responsible to protect the integrity of the accident site including but not limited to: the safeguarding of all evidence, documentation of all personnel on site at the time of the accident, gather facts related to all accidents, incidents, or near miss, and prepare required DDC Construction Accident Report as per DDC's Construction Safety Emergency and Accident Notification and Response Procedure. Maintain all records pertaining to accidents, incidents, and near miss and have them available upon request.
13. Notify the Office of Construction Safety within two (2) hours of the start of an inspection by any outside/ regulatory agency personnel, including NYS, OSHA, NYC DOB or any other City/State/Federal oversight entity and forward a copy of the inspection report within one business day of its receipt.
14. Escort and assist Construction Safety Auditors during all field and record audits.
15. Report any emergency conditions to the Office of Construction Safety immediately.

Note: In addition to the responsibilities listed above, if the Resident Engineer is a CM/REI or other non-City party hired by the City to manage the Project, the Resident Engineer is also required to do the following:

16. Provide personnel who are certified and or trained appropriately for the requirements of the project.
17. Perform an investigation for any project-related accidents, incidents, and near misses. Within 24-hours of the time of the accident, incident, or near miss, the CM/REI will submit an investigation report to the Office of Construction Safety. Such report will include proposed remedial measures and implementation of corrective actions to prevent recurrence.

DDC reserves the right to request that the CM/REI replace any CM/REI personnel for any reason at any time during the project.

B. Construction Contractors

Note: For CM-Build and CM-Design-Build Projects, the CM will meet all requirements listed in this section, as well as the Resident Engineer section above.

1. Submit a completed Safety Questionnaire and other safety performance related documentation with its bid or as part of a pre-qualification package.
2. Submit a Site Safety Plan within 30 days from the Award Date or as otherwise directed. The Site Safety Plan is subject to review and acceptance by the Office of Construction Safety prior to the commencement of work at the site. The Site Safety Plan will be revised and updated as necessary during the course of the project. If requested by the Office of Construction Safety, the Site Safety Plan must be developed and submitted for approval using a web-based system, the Site Safety Plan Application (SSP App).
3. Designate and identify a Project Safety Representative in the Site Safety Plan. The Contractor will immediately notify the Office of Construction Safety, in a form and manner acceptable to the Office of Construction Safety, of any permanent change to the designated Project Safety Representative. In the event the primary designated Project Safety Representative is temporary unable to perform his or her duties, an alternate Project Safety Representative will be provided. Resumes, outlining the qualification and experience for the Project Safety Representative (s) will be included in the Site Safety Plan and available upon request. DDC reserves the right to request the Contractor to replace a Project Safety Representative for any reason at any time during the course of the project.
4. Designate and identify a Competent Person(s) in the Site Safety Plan. Contractor/subcontractor may be required to provide more than one competent person due to construction operations and based on a number of work tasks/areas. DDC reserves the right to request the Contractor to replace a Competent Person or provide additional Competent Person(s) for any reason at any time during the course of the project. The Competent Person will be present at the site during all work activities.
5. For certain projects, as defined in New York City Construction Codes – Title 28, designate and identify the Licensed Site Safety Manager or Registered Construction Superintendent. Resumes, outlining the qualification and experience for the Licensed Site Safety Manager or Registered Construction Superintendent will be included in the Site Safety Plan and available upon request. The Contractor will immediately notify the Office

of Construction Safety, in a form and manner acceptable to the Office of Construction Safety, of any permanent change to the designated Site Safety Manager and/or Construction Superintendent. In the event the primary designated Site Safety Manager or Construction Superintendent is temporarily unable to perform his or her duties, an alternate Licensed Site Safety Manager and/or Registered Construction Superintendent will be provided. The Office of Construction Safety must be informed of such change. DDC reserves the right to request the Contractor to replace Site Safety Manager or Construction Superintendent for any reason at any time during the course of the project.

6. Develop a written Job Hazard Analysis (JHA) that identifies safety hazards and control methods for project specific work tasks. A preliminary JHA will be included in the Site Safety Plan submitted by the Contractor. A JHA is a living document that will be re-evaluated and revised to address new hazards and tasks that may develop during the course of the project and will be present at the worksite and produced upon request.
7. Develop project specific safety procedures to protect employees, general public, and property during all construction activities for the duration of the project.
8. Ensure that all employees are aware of the hazards associated with the project through documented formal and informal training and/or other communications. Conduct and document new employee and site-specific safety orientation for all Contractor and subcontractor personnel to review the hazards associated with the project as identified in the Site Safety Plan and the specific safety procedures and controls that will be used to protect workers, the general public and property. The Project Safety Representative will conduct this training prior to mobilization and if necessary during the course of the project. Documentation will be provided to the RE.
9. Prior to performing any work on DDC projects all Contractor's and subcontractor's employees will, at a minimum, have successfully completed, within the previous five calendar years, an OSHA 10-hour construction safety course.

   All training records (OSHA 10-hour, flagger, scaffold, fall protection, confined space, etc.) will be provided to the RE prior to mobilization, included in the Site Safety Plan, kept current during the course of the project, and available for review.
10. Conduct and document weekly safety meetings and daily job briefing sessions for the duration of the project. Attendance at weekly safety meetings and daily job briefing sessions is mandatory. A written record of weekly safety meetings will be available upon request and job briefing sessions will be available at the worksite.
11. As part of the Site Safety Plan, prepare site specific procedures, such as maintenance and protection of traffic plan, steel erection plan, confined space program, fall protection plan, demolition plan, site specific emergency evacuation plan, etc. (if not otherwise provided in the contract documents) and comply with all of its provisions.
12. Have immediately available for review at the project site where actual construction activities are being performed all applicable documentation, including but not limited to: JHAs for work tasks being performed, all required training records, MPT plan (where applicable), Noise and Dust Mitigation Plans, excavation protective system drawings (where applicable), Emergency Evacuation plan, fall protection program (where applicable), confined space program (where applicable), all required permits, daily job briefing records, all required documentation for crane operation (where applicable), daily inspection checklist, scaffold and sidewalk drawings (when applicable), safety data sheets for chemicals in use.
13. Comply with all federal, state and local safety and health rules, laws, and regulations.
14. Comply with all provisions of the Site Safety Plan.
15. Provide, replace, and adequately maintain at or around the project site, suitable and sufficient signage, lights, barricades and enclosures (fences, sidewalk sheds, netting, bracing, etc.). The project specific MPT plan will be developed, implemented, and reviewed during the course of the project.
16. The Project Safety Representative will conduct daily safety inspections, document the inspection results, implement corrective actions for the identified hazards. Maintain the inspection records and have them available upon request.
17. **Report unsafe or unhealthy conditions to the RE as soon as practical, but no more than 24 hours after discovery, and take prompt actions to remove or abate such conditions. Should an imminent dangerous condition be discovered, Contractor will stop all work in the area of danger until corrections are made.**
18. Report all accidents, incidents and near misses involving injuries to workers or the general public, as well as property damage, to the RE within one (1) hour.
19. Following an accident or incident, unless otherwise directed, the Contractor will not remove or alter any equipment, structure, material, or evidence related to the accident or incident. Exception: Immediate emergency procedures taken to secure structures, temporary construction, operations, or equipment that pose a continued imminent danger or facilitate assistance for persons who are trapped or who have sustained bodily injury. Take

additional measures as necessary to secure the accident or incident site and to protect against any further injury or property damage.

20. The Contractor will perform an investigation into the root cause of the accident, incident, or near miss. Within 24 hours of an accident, incident, or near miss, the Contractor will prepare and submit to the RE a written investigation report detailing findings, corrective actions, and hazard mitigation implementation to prevent recurrence.
21. Notify the RE within two (2) hours of the start of an inspection by any outside regulatory agency personnel, including OSHA, NYC DOB, or others.
22. Maintain all records pertaining to all required safety compliance documents, accidents and incidents reports. DDC reserves the right to request copy of any records pertaining to the safety of the project and required by DDC and other federal, state, and city agencies, including but not limited to permits, training records, safety inspection records, drawings, equipment records, etc.
23. Cooperate with DDC Office of Construction Safety/ RE and address DDC recommendations on safety, which will in no way relieve the Contractor of its responsibilities for safety on the project. The Contractor has sole responsibility for safety.

V. SAFETY QUESTIONNAIRE

DDC requires that all Contractors provide information regarding their current and past safety performance and programs. This will be accomplished by the use of the DDC Safety Questionnaire. As a part of the bid submittal package, the contractor will submit a completed DDC Safety Questionnaire listing company workers' compensation experience modification rating and OSHA Incident Rates for the three (3) years prior to the date of the bid opening. DDC may request a Contractor to update its Questionnaire at any time or to provide more detailed information. The Contractor will provide the requested information within 15 days.

The following criteria will be used by DDC in reviewing the Contractor's responsibility, which will be based on the information provided on the questionnaire:

Criteria 1: OSHA Injury and Illness Rates (I&IR) are no greater than the average for the industry (based on the most current Bureau of Labor Statistics data for the Contractors SIC code); and

Criteria 2: Insurance workers compensation Experience Modification Rate (EMR) equal to or less than 1.0; and

Criteria 3: Any willful violations issued by OSHA or NYC DOB within the last three (3) years; and

Criteria 4: A fatality (worker or member of public) and injuries, requiring OSHA notification, experienced on or near Contractor's worksite within the last three (3) years; and

Criteria 5: Past safety performance on DDC projects (accidents; status of site safety plan submittals; etc.)

Criteria 6: OSHA violation history for the last three (3) years;

Criteria 7: Contractor will provide OSHA Injury and Illness Records (currently OSHA 300 and 300A Logs) for the last three (3) years.

If the Contractor fails to meet the basic criteria listed above, the Office of Construction Safety may request, through the ACCO, more details concerning the Contractor's safety experience. DDC may request the Contractor to provide copies of, among other things, accident investigation reports, OSHA records, OSHA and NYC DOB citations, EPA citations and written corrective action plan.

VI. SITE SAFETY PLAN

Within thirty (30) days from the Award Date or as otherwise directed, the Contractor will submit the Site Safety Plan. The Site Safety Plan will identify project work scope, safety hazards associated with the project tasks, and include specific safety procedures and training appropriate and necessary to complete the work. The Site Safety Plan is subject to review and acceptance by the Office of Construction Safety prior to the commencement of work at the site. Due to the project work scope and project duration, the Office of Construction Safety may grant a conditional acceptance for a Site Safety Plan without all sections being complete. In a case of a "Conditional Acceptance" of a Site Safety Plan,

the Contractor will provide the remaining sections previously incomplete and/or not submitted for review and acceptance by the Office of Construction Safety prior to the commencement of the construction activities. The Office of Construction Safety reserves the right to withdraw the initial "Conditional Acceptance" if the Contractor fails to provide the remaining sections of a Site Safety Plan. Failure by the Contractor to submit an acceptable Site Safety Plan will be grounds for default.

Site Safety Plan requirements: The Site Safety Plan will be a written document and will apply to all project specific Contractor and subcontractor operations, and will have at a minimum, the following elements with each described in a separate section (It may be necessary to modify the basic format for certain unique or high-risk projects, such as tunnels or high-rise construction). All Site Safety Plan sections will be numbered in the order listed below. For sections, which are not applicable for the type of the work being performed by the Contractor on DDC project, the Contractor will in writing indicate "Not applicable based on the project work scope." The Site Safety Plan will include Contractor's name, DDC project ID, project location (s), and development and revision dates. The Site Safety Plan will include the sections, attachments, and appendixes provided in the Site Safety Plan. All pages of the Site Safety Plan will be numbered. If requested by the Office of Construction Safety, the Site Safety Plan must be developed and submitted for approval using a web-based system, the Site Safety Plan Application (SSP App).

1. Project Work Scope – Detailed information regarding work tasks that will be performed by Contractor and subcontractors under the project.
2. Responsibility and Organization – Contractor's organization chart with responsible personnel for the project, including titles, names, contact information, roles, and responsibilities. All Contractor's personnel required by the DDC Safety Requirements will be identified.
3. Safety Training and Education – OSHA 10 Hours training, requirements for daily safety briefings and weekly safety meetings, any work task specific training, responsible staff for implementation of training program for the project.
4. Job Hazard Analysis (JHA) – Project specific Job Hazard Analysis including work tasks, identified hazards, hazard control methods (administrative, engineering, PPE) to protect workers, property and general public, Contractor's name, project id, location, name and signature of a certifying person, hazard assessment date.
5. Protection of Public – Project specific procedures covering safety of the general public during all project construction activities.
6. Hazard Corrective Actions - Procedures for hazard identification, including responsible person(s), frequency of safety inspections, implementation of corrective actions, safety inspection checklist.
7. Accident/Exposure Investigation – Project specific procedures for accident/incident/near miss investigation and implementation of corrective actions. Accident/incident/near miss notification procedure of DDC project staff (timer frame and responsible personnel).
8. Recording and Reporting Injuries – Procedures to meet 29 CFR 1904 requirements.
9. First Aid and Medical Attention – Responsible staff, location and inspection of First Aid kit, directions to local hospitals; emergency telephone numbers.
10. Project Specific Fire Protection and Prevention Program – Project specific procedures, including responsible staff, fire alarm system/methods, hot work procedures, etc.
11. Housekeeping Procedure.
12. Project Specific Illumination Procedure.
13. Project Specific Sanitation Procedure.
14. Personal Protective Equipment (PPE), including Respiratory Protection Program and Hearing Conservation Program, if required.
15. Hazard Communication Program – Contractor's Hazard Communication Program, responsible staff; training; SDS records, project specific list of chemicals; location of the program and SDS records.
16. Means of Egress – Information regarding free and unobstructed egress from all parts of the building or structure; exit marking; maintenance of means of egress, etc.
17. Employee Emergency Action Plan – Project specific: responsible staff, emergency alarm system/devices, evacuation procedure, procedure to account for employees after evacuation, etc.
18. Evacuation Plan – Project specific evacuation plan (drawing/scheme) with exists and evacuation routes.
19. Ionizing/Nonionizing Radiation – Competent person, license and qualification requirements, type of radiation, employee's exposure and protection, safety procedures, etc.

20. Material Handling, Storage, Use and Disposal – Project specific information regarding material storage, disposal, and handling: procedures, plan/drawings, etc.
21. Signs, Signals, and Barricades – Use of danger/warning signs, safety instruction signs, sidewalk closure and pedestrian fencing and barricades (if not included in the MPT plan), etc.
22. Tools – Hand and Power – Safety procedures for the type of tools to be used.
23. Scaffold – Project specific scaffold types, procedures, training requirements, scaffold drawings, designed, sealed, and signed by NYS Licensed Professional Engineer, or as otherwise directed; competent person, criteria for project specific scaffold, falling object protection, procedures for aerial lifts/scissor lifts.
24. Welding and Cutting – Project specific procedure for welding and cutting, including all necessary safety requirements such as fire prevention, personal protective equipment, hot work permits (if not covered by Contractor's Fire Prevention and Protection program, FDNY certificate requirements).
25. Electrical Safety – Project specific procedures, including lock out-tag out.
26. Fall Protection – Project specific information regarding selected fall protection systems, fall protection plan, responsible staff.
27. Cranes, Derrick, Hoists, Elevators, Conveyors – project specific equipment information including type, rated load capacity, manufacture specification requirements, competent person, exposure to falling load, inspection, recordkeeping, clearance requirements, communication procedure, ground lines, permits.
28. Excavation Safety – Competent person; excavation procedures; project specific protective system, including drawings, designed, sealed, and signed by NYS Licensed Professional Engineer, or as otherwise directed.
29. Protection of Underground Facilities and Utilities Procedure, including responsible staff and responsibilities.
30. Concrete and Masonry Construction Procedures
31. Maintenance and Protection of Traffic Plan – Project specific MPT plan, designed, sealed, and signed by NYS Licensed Professional Engineer, or as otherwise directed; flagmen training, public safety, etc.
32. Steel Erection – Site specific erection plan, requirements for applicable written notifications, competent person, fall protection plan, training requirements, etc.
33. Demolition – Engineering survey, including written evidence, disconnection of all effected utilities, identification of all hazardous chemicals, materials, gases, etc., floor openings, chutes, inspection and maintenance of all stairs/passageways, removal of materials/debris/structural elements, lock out/tag out, competent person.
34. Blasting and the Use of Explosives – Project specific safety procedures, warning signs, training/qualification, transportation, storage and use of explosives, inspection.
35. Stairways and Ladders – Types of stairs and ladders, safety procedures, training requirements.
36. Alcohol and Drug Abuse Policy
37. Rodents and Vermin Controls
38. Toxic and Hazardous Substances – Safety procedures for substances that Contractor's and subcontractor's employees can be exposed on project.
39. Noise Mitigation Plan – Completed project specific Noise Mitigation Plan, and noise mitigation procedures.
40. Confined Space Program – Project specific Confined Space Program, responsible staff, training records, equipment information, rescue procedure, list of project specific confined spaces, forms.
41. Construction Vehicles/Heavy Equipment – Type of construction vehicles/heavy equipment to be used on site, procedures
42. Dust Mitigation Plan – Completed project specific Dust Mitigation Plan, and dust mitigation procedures.
43. Working Over and Near Water. Diving Operations – safety procedures including personal protective equipment, fall protection, rescue services, etc.

The most critical component of the Site Safety Plan is the Job Hazard Analysis (JHA) section. The JHA form is a written document prepared by the Contractor. The Contractor will conduct a site and task assessment to identify the tasks and any potential safety or environmental hazards related to performance of the work, eliminate or implement controls for the potential hazards, and identify proper personal protective equipment for the task. The JHA will be communicated to all Contractor/subcontractor personnel on site. The JHA will include safety hazard identification and controls to protect employees, general public, and property.

The initial JHA will be included in the Contractor's Site Safety Plan and the current JHA form will be available at the construction site for reference. A JHA is a living document that will be re-evaluated and revised to address new hazards and tasks that may develop and will be present at the worksite and produced upon request.

VII. KICK-OFF MEETINGS/PRE-CONSTRUCTION AND SAFETY REVIEW

Prior to the start of construction activities on all DDC projects, RE will invite the Office of Construction Safety to the construction kick-off meeting. The Office of Construction Safety representative(s) will participate in this meeting with the Contractor and RE for the purpose of:

A. Reviewing DDC Contract Safety Requirements
B. Reviewing site-specific safety issues based on a project work scope, location, and any other factors which may impact safety of workers and general public.
C. Reviewing the Site Safety Plan and JHA requirements.
D. Reviewing Accident/Incident reporting and investigation procedures.
E. Reviewing designated safety contacts, roles, and responsibilities.
F. Discussing planned inspections and audits of the site by the Office of Construction Safety personnel.

VIII. EVALUATION DURING WORK IN PROGRESS

The Contractor's adherence to these Safety Requirements will be monitored throughout the project. This will be accomplished by the following:

A. Use of a safety checklist by a representative of the Office of Construction Safety (or other designated DDC representative) and the RE during regular inspections and comprehensive audits of the job site. Field Exit Conferences will be held with the RE and Contractor Project Safety Representatives.
B. The RE will continually monitor the safety and environmental performance of the Contractor's employees and work methods. Deficiencies will be brought to the attention of the Contractor's Project Safety Representative on site for immediate correction. The RE will maintain a written record of these deficiencies and have these records available upon request. Any critical deficiencies will be immediately reported to the Office of Construction Safety via telephone (718)391-1911.
C. If the Contractor's safety performance during the project is not up to DDC standards (safety performance measure, accident/incident rate, etc.) the Director – Office of Construction Safety, or his/her designee will meet with the Contractor's Project Safety Representative and other representatives, the RE, and the DDC Environmental Specialist (if environmental issues are involved). The purpose of this meeting is to 1) determine the level of non-compliance; 2) explain and clarify the safety/environmental provisions; 3) agree on a future course of action to correct the deficiencies.
D. If the deficiencies continue, the Commissioner may, without limitation, declare the Contractor in default.
E. The Contractor will within 1 hour inform the RE of all accidents/incidents/near misses including all fatalities, any injuries to employees or members of the general public, and property damage (e.g., structural damage, equipment rollovers, utility damage, loads dropped from crane). The RE will notify the Office of Construction Safety as per DDC's Construction Safety Emergency and Accident Notification and Response Procedure and will maintain a record of all Contractor accidents/incidents for the project.
F. The Contractor and the RE will notify the Office of Construction Safety within two (2) hours of the start of any NYS-DOL/ NYC-COSH/ OSHA/ EPA inspections.

IX. SAFETY PERFORMANCE EVALUATION

The Contractor's safety record, including accident/incident history and DDC safety inspection results, will be considered as part of the Contractor's performance evaluation at the conclusion of the project. Poor safety performance during the course of the project will be a reason to rate a Contractor unsatisfactory which may be reflected in the City's PASSPort system and will be considered for future procurement actions as set forth in the City's Procurement Policy Board Rules.

NOTICE TO BIDDERS

Please be advised that the following Riders to the March 2017 New York City Standard Construction Contract have been attached and incorporated in this Invitation for Bid:

- Rider regarding Community Hiring for Construction Contracts;
- Rider regarding Non-Compensable Delays and Grounds for Extension;
- Rider regarding NYC Earned Safe and Sick Time Act;
- Rider regarding City Fleet and Truck Safety Requirements for City Contractors.

Other than provisions specifically delineated in the Riders, all other terms of the March 2017 New York City Standard Construction Contract continue to apply in full force and effect.

Community Hiring Rider

For Construction Contracts

Version: February 20, 2025

Program Description

Community Hiring, as authorized under Chapter 79 of the New York City Charter ("Charter"), is an initiative to set workforce goals on City procurement for contractors to employ low-income individuals and residents of economically disadvantaged communities.

The provisions set forth in this Rider shall apply to contracts with a total value exceeding three million dollars, unless otherwise exempt under the rules set forth under the Community Hiring Rules, adopted as Title 74 of the Rules of the City of New York (RCNY). Under 74 RCNY § 1-03(b), the following contracts are exempt: preferred source contracts; contracts for the performance of services by a city-affiliated not-for-profit corporation, goods contracts; contracts in an amount below the small purchase threshold; contracts for investigative or confidential services; contracts subject to federal or state funding requirements that preclude or substantially conflict with the application of Community Hiring Goals; contracts awarded through the United States General Services administration, or through the New York State Office of General Services; contracts for emergency demolition services procured by the Department of Housing Preservation and Development; contracts for which contractor selection is made by an elected official other than the Mayor or an agency other than a Mayoral Agency; contracts subject to 9 RCNY § 1-02(f); contracts designated for inclusion in a mentoring program as defined in Section 1206 or 1309 of the Charter; and contracts for banking services, electronic payment services, or other related services procured by the New York City Department of Finance.

The Community Hiring Rules are hereby incorporated in this Contract by reference and all terms used herein shall have the meanings given such terms in the Community Hiring Rules. In the event of any conflict between the Community Hiring Rules and this Rider, the rules shall control. As of the execution of this Contract, the Contactor represents that it has read, in its entirety, and agrees to comply with the Community Hiring Rules.

The Community Hiring program supersedes the HireNYC initiatives and the related riders, including, but not limited to references to the Public Assistance Commitment Rider and the HireNYC Hiring and Employment Rider. Article 35.6 of this Contract is amended and replaced with the Community Hiring Rules.

Community Hiring Requirements

The Contractor agrees to comply with the requirements of the Community Hiring Rules in the performance of this Contract.

A. Community Hiring Goal

Pursuant to 74 RCNY § 4-02(b), the Contractor shall make best efforts to meet the applicable Community Hiring Goal to employ Residence-Based Community Hires as defined in 74 RCNY § 2-01(a) for contracts involving construction work.

For each Contract involving Construction Work that is not subject to a Project Labor Agreement, the Contractor shall agree to make best efforts to meet the Community Hiring Goal of 30 percent of cumulative labor hours of construction work to be performed by Residence-Based Community Hires as established in 74 RCNY § 4-02(b)(1). For contracts involving Construction Work that are subject to a Project Labor Agreement, the Contractor shall agree to make best efforts to meet the numerical goal(s) regarding Residence-Based Community Hires and Apprentices established in such Project Labor Agreement.

In accordance with 74 RCNY § 5-01(b), the Contractor shall require its subcontractors, as defined under 74 RCNY § 1-02, to make best efforts to meet the applicable Community Hiring Goal.

B. Advertising Employment Opportunities

The Contractor, except those performing Construction Work pursuant to a Project Labor Agreement, agrees to advertise the Employment Opportunities, as defined in 74 RCNY § 1-02, in conspicuous places available to the public and in a manner reasonable for the industry.

For purposes of meeting a Community Hiring Goal, the Contractor shall notify a Referral Source, as provided in accordance with 74 RCNY § 3-02(a), of the job opportunities to be filled by Community Hires. The Contractor shall provide notice to the Office of Community Hiring and Workforce Development (OCH) when the Referral Source has impeded the Contractor's efforts to meet the Community Hiring Goal.

C. System Enrollment and Reporting

The Contractor shall enroll with an electronic system designated by the Director of OCH in accordance with 74 RCNY § 5-01(e).

Once enrolled into the system, the Contractor shall be responsible for updating the information in the system in a reasonable and timely manner.

The Contractor may fulfill the advertising requirement set forth in 74 RCNY § 5-01(c) by posting in such system all the relevant information of an Employment Opportunity to be filled by Community Hires. The Contractor shall also provide, upon request by the City with reasonable notice, any information related to the Contractor's compliance with or progress towards meeting the Community Hiring Goal.

Records

A. Retention

The Contractor shall maintain records in accordance with the applicable requirements set forth in 74 RCNY §§ 6-01 and 6-02.

For purposes of 74 RCNY § 6-01(b), the Contractor shall designate a representative to monitor all activity related to compliance to ensure that the Contractor is exercising best efforts to meet the Community Hiring Goal and maintain records to submit the documentation relating to the provisions herein.

B. Access to Records

The Contractor shall furnish, and require its subcontractors to furnish, all information and reports in accordance with the laws, rules, regulations or guidance from the City.

Compliance

Without limitation to any other provisions under this Contract and any other remedies available to the City, a failure to comply with the requirements under the Community Hiring Rules is a non-compliance that may be subject to civil penalties pursuant to Chapter 7 of the Community Hiring Rules and may be considered as a factor in evaluating contract performance in accordance with 9 RCNY § 4-01.

A. Best Efforts

Where the Contractor has failed to meet the Community Hiring Goal, the Contractor shall demonstrate that it exercised best efforts to meet the goal. Where determined, as set forth in 74 RCNY § 5-03, that the Contractor failed to make best efforts, the City shall send written notice to the Contractor's designated representative, notwithstanding the notice provisions in the Contract. The Contractor shall respond in accordance with the instructions in the notice. Failure to timely respond can result in a non-compliance determination subject to civil penalties as set forth in 74 RCNY § 7-01.

B. Corrective Action

Where the City determines that the non-compliance may be remedied through a corrective action and provides notice to the Contractor pursuant to 74 RCNY § 7-02(a)(2), the Contractor shall respond in accordance with the requirements outlined in the notice. The Contractor is responsible for timely demonstration of taking the requisite corrective action. Demonstration of corrective action to the satisfaction of the Director of OCH, may result in waiving of the civil penalties[1] as set forth in the Community Hiring Rules.

[1] Only civil penalties relating to non-compliance with the Community Hiring Rules can be waived in this instance.

C. Civil Penalties

Where Contractor is found non-compliant subject to civil penalties, the City can impose a civil penalty amount in accordance with the schedule set forth in 74 RCNY § 7-03.

The City may withhold from the Contractor the amount of the civil penalties upon final determination as set forth in 74 RCNY § 7-01(d).

RIDER TO NEW YORK CITY STANDARD CONSTRUCTION CONTRACT (MARCH 2017) REGARDING NON-COMPENSABLE DELAYS AND GROUNDS FOR EXTENSION

The following provisions supersede the corresponding provisions in the March 2017 version of the New York City Standard Construction Contract:

1. Section **11.5.1** provides as follows:

   11.5.1 The acts or omissions of public or government bodies (other than **City** agencies) or of any third parties who are disclosed in the **Contract Documents,** or those third parties who are ordinarily encountered or who are generally recognized as related to the **Work**, including but not limited to, **Other Contractors**, utilities or private enterprises;

2. Section **11.5.6** provides as follows:

   11.5.6 Climatic conditions, storms, floods, droughts, tidal waves, fires, hurricanes, earthquakes, landslides or other catastrophes or acts of God; acts of war or of the public enemy or terrorist acts; disruption, outage or power failure caused by a utility's inability or failure to provide service, pandemics, epidemics, outbreaks of infectious disease or any other public health emergency; other states of emergency declared by the City, State or Federal government , quarantine restrictions, and freight embargoes; including the **City's** reasonable responses to any of the above; and

3. Section **13.3** provides as follows:

   13.3 Grounds for Extension: If such application is made, the **Contractor** shall be entitled to an extension of time for delay in completion of the **Work** caused solely:

   13.3.1 By any of the acts or omissions of the **City**, its officials, agents or employees set forth in Articles **11.4.1.1** through **11.4.1.9**; or

   13.3.2 By or attributable to any of the items set forth in Articles **11.5.1** through **11.5.7**.

   13.3.3 The **Contractor** shall, however, be entitled to an extension of time for such causes only for the number of **Days** of delay which the **ACCO** or the Board may determine to be due solely to such causes, and then only if the **Contractor** shall have strictly complied with all of the requirements of Articles 9 and 10.

NYC EARNED SAFE AND SICK TIME ACT CONTRACT RIDER

(To supersede Section 4.06 of the January 2018 Appendix A and Section 35.5 of the March 2017 Standard Construction Contract and to be attached to other City contracts and solicitations)

A. *Introduction and General Provisions.*

1. The Earned Safe and Sick Time Act ("ESSTA"), codified at Title 20, Chapter 8 of the New York City Administrative Code, also known as the "Paid Safe and Sick Leave Law," requires covered employees (as defined in Admin. Code § 20-912) in New York City ("City") to be provided with paid safe and sick time. Contractors of the City or of other governmental entities may be required to provide safe and sick time pursuant to the ESSTA. The ESSTA is enforced by the City's Department of Consumer and Worker Protection ("DCWP"), which has promulgated 6 RCNY §§ 7-101 and 201 *et seq*. ("DCWP Rules").

2. The Contractor agrees to comply in all respects with the ESSTA and the DCWP Rules, and as amended, if applicable, in the performance of this agreement. The Contractor further acknowledges that such compliance is a material term of this agreement and that failure to comply with the ESSTA in performance of this agreement may result in its termination.

3. The Contractor must notify (with a copy to DCWP at ComplianceMonitoring@dcwp.nyc.gov) the Agency Chief Contracting Officer of the City Agency or other entity with whom it is contracting in writing within 10 days of receipt of a complaint (whether oral or written) or notice of investigation regarding the ESSTA involving the performance of this agreement. Additionally, the Contractor must cooperate with DCWP's guidance and must comply with DCWP's subpoenas, requests for information, and other document demands as set forth in the ESSTA and the DCWP Rules. More information is available at https://www1.nyc.gov/site/dca/about/paid-sick-leave-what-employers-need-to-know.page.

4. Upon conclusion of a DCWP investigation, Contractor will receive a findings letter detailing any employee relief and civil penalties owed. Pursuant to the findings, Contractor will have the opportunity to settle any violations and cure the breach of this agreement caused by failure to comply with the ESSTA either i) without a trial by entering into a consent order or ii) appearing before an impartial judge at the City's administrative tribunal. In addition to and notwithstanding any other rights and remedies available to the City, non-payment of relief and penalties owed pursuant to a consent order or final adjudication within 30 days of such consent order or final adjudication may result in the termination of this agreement without further opportunity to settle or cure the violations.

5. The ESSTA is briefly summarized below for the convenience of the Contractor. The Contractor is advised to review the ESSTA and the DCWP Rules in their entirety. The Contractor may go to www.nyc.gov/PaidSickLeave for resources for employers, such as Frequently Asked Questions, timekeeping tools and model forms, and an event calendar of upcoming presentations and webinars at which the Contractor can get more information about how to comply with the ESSTA and the DCWP Rules. The Contractor acknowledges that it is responsible for compliance with the ESSTA and the DCWP Rules notwithstanding any inconsistent language contained herein.

B. *Pursuant to the ESSTA and DCWP Rules: Applicability, Accrual, and Use.*

1. An employee who works within the City must be provided paid safe and sick time.[1] Employers with one hundred or more employees are required to provide 56 hours of safe and sick time for an employee each calendar year. Employers with fewer than one hundred employees are required to provide 40 hours of sick leave each calendar year. Employers must provide a minimum of one hour of safe and sick time for every 30 hours worked by an employee and compensation for such safe and sick time must be provided at the greater of the employee's regular hourly rate or the minimum wage at the time the paid safe or sick time is taken. Employers are not discouraged or prohibited from providing more generous safe and sick time policies than what the ESSTA requires.

2. Employees have the right to determine how much safe and sick time they will use, provided that an employer may set a reasonable minimum increment for the use of safe and sick time not to exceed four hours per day. For the use of safe time or sick time beyond the set minimum increment, an employer may set fixed periods of up to thirty minutes beyond the minimum increment. In addition, an employee may carry over up to 40 or 56 hours of unused safe and sick time to the following calendar year, provided that no employer is required to carry over unused paid safe and sick time if the employee is paid for such unused safe and sick time and the employer provides the employee with at least the legally required amount of paid safe and sick time for such employee for the immediately subsequent calendar year on the first day of such calendar year.

3. An employee entitled to safe and sick time pursuant to the ESSTA may use safe and sick time for any of the following:

a. such employee's mental illness, physical illness, injury, or health condition or the care of such illness, injury, or condition or such employee's need for medical diagnosis or preventive medical care;

b. such employee's care of a family member (an employee's child, spouse, domestic partner, parent, sibling, grandchild, or grandparent, the child or parent of an employee's spouse or domestic partner, any other individual related by blood to the employee, and any other individual whose close association with the employee is the equivalent of a family relationship) who has a mental illness, physical illness, injury or health condition or who has a need for medical diagnosis or preventive medical care;

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[1] Pursuant to the ESSTA, if fewer than five employees work for the same employer, and the employer had a net income of less than one million dollars during the previous tax year, such employer has the option of providing such employees uncompensated safe and sick time.

c. closure of such employee's place of business by order of a public official due to a public health emergency;

d. such employee's need to care for a child whose school or childcare provider has been closed due to a public health emergency; or

e. when the employee or a family member has been the victim of a family offense matter, sexual offense, stalking, or human trafficking:

1. to obtain services from a domestic violence shelter, rape crisis center, or other shelter or services program for relief from a family offense matter, sexual offense, stalking, or human trafficking;
2. to participate in safety planning, temporarily or permanently relocate, or take other actions to increase the safety of the employee or employee's family members from future family offense matters, sexual offenses, stalking, or human trafficking;
3. to meet with a civil attorney or other social service provider to obtain information and advice on, and prepare for or participate in any criminal or civil proceeding, including but not limited to, matters related to a family offense matter, sexual offense, stalking, human trafficking, custody, visitation, matrimonial issues, orders of protection, immigration, housing, discrimination in employment, housing or consumer credit;
4. to file a complaint or domestic incident report with law enforcement;
5. to meet with a district attorney's office;
6. to enroll children in a new school; or
7. to take other actions necessary to maintain, improve, or restore the physical, psychological, or economic, health or safety of the employee or the employee's family member or to protect those who associate or work with the employee.

4. An employer must not require an employee, as a condition of taking safe and sick time, to search for a replacement. However, where the employee's need for safe and sick time is foreseeable, an employer may require an employee to provide reasonable notice of the need to use safe and sick time. For an absence of more than three consecutive work days, an employer may require reasonable documentation that the use of safe and sick time was needed for a reason listed in Admin. Code § 20-914; and/or written confirmation that an employee used safe and sick time pursuant to the ESSTA. However, an employer may not require documentation specifying the nature of a medical condition, require disclosure of the details of a medical condition, or require disclosure of the details of a family offense matter, sexual offense, stalking, or human trafficking, as a condition of providing safe and sick time. Health information and information concerning family offenses, sexual offenses, stalking or human trafficking obtained solely due to an

employee's use of safe and sick time pursuant to the ESSTA must be treated by the employer as confidential. An employer must reimburse an employee for all reasonable costs or expenses incurred in obtaining such documentation for the employer.

5. An employer must provide to all employees a written policy explaining its method of calculating sick time, policies regarding the use of safe and sick time (including any permissible discretionary conditions on use), and policies regarding carry-over of unused time at the end of the year, among other topics. It must provide the policy to employees using a delivery method that reasonably ensures that employees receive the policy. If such employer has not provided its written policy, it may not deny safe and sick time to an employee because of non-compliance with such a policy.

6. An employer must provide a pay statement or other form of written documentation that informs the employee of the amount of safe/sick time accrued and used during the relevant pay period and the total balance of the employee's accrued safe/sick time available for use.

7. Safe and sick time to which an employee is entitled must be paid no later than the payday for the next regular payroll period beginning after the safe and sick time was used.

C. *Exemptions and Exceptions*. Notwithstanding the above, the ESSTA does not apply to any of the following:

1. an independent contractor who does not meet the definition of employee under N.Y. Labor Law § 190(2);

2. an employee covered by a valid collective bargaining agreement, if the provisions of the ESSTA are expressly waived in such agreement and such agreement provides a benefit comparable to that provided by the ESSTA for such employee;

3. an audiologist, occupational therapist, physical therapist, or speech language pathologist who is licensed by the New York State Department of Education and who calls in for work assignments at will, determines their own schedule, has the ability to reject or accept any assignment referred to them, and is paid an average hourly wage that is at least four times the federal minimum wage;

4. an employee in a work study program under Section 2753 of Chapter 42 of the United States Code;

5. an employee whose work is compensated by a qualified scholarship program as that term is defined in the Internal Revenue Code, Section 117 of Chapter 20 of the United States Code; or

6. a participant in a Work Experience Program (WEP) under N.Y. Social Services Law § 336-c.

D. *Retaliation Prohibited.* An employer shall not take any adverse action against an employee that penalizes the employee for, or is reasonably likely to deter the employee from or interfere with the employee exercising or attempting in good faith to exercise any right provided by the ESSTA. In addition, an employer shall not interfere with any investigation, proceeding, or hearing pursuant to the ESSTA.

E. *Notice of Rights.*

1. An employer must provide its employees with written notice of their rights pursuant to the ESSTA. Such notice must be in English and the primary language spoken by an employee, provided that DCWP has made available a translation into such language. Downloadable notices are available on DCWP's website at https://www1.nyc.gov/site/dca/about/Paid-Safe-Sick-Leave-Notice-of-Employee-Rights.page. The notice must be provided to the employees by a method that reasonably ensures personal receipt by the employee.

2. Any person or entity that willfully violates these notice requirements is subject to a civil penalty in an amount not to exceed $50.00 for each employee who was not given appropriate notice.

F. *Records*. An employer must retain records documenting its compliance with the ESSTA for a period of at least three years, and must allow DCWP to access such records in furtherance of an investigation related to an alleged violation of the ESSTA.

G. *Enforcement and Penalties.*

1. Upon receiving a complaint alleging a violation of the ESSTA, DCWP must investigate such complaint. DCWP may also open an investigation to determine compliance with the ESSTA on its own initiative. Upon notification of a complaint or an investigation by DCWP, the employer must provide DCWP with a written response and any such other information as DCWP may request. If DCWP believes that a violation of the ESSTA has occurred, it has the right to issue a notice of violation to the employer .

2. DCWP has the power to grant an employee or former employee all appropriate relief as set forth in Admin. Code § 20-924(d). Such relief may include, but is not limited to, treble damages for the wages that should have been paid; statutory damages for unlawful retaliation; and damages, including statutory damages, full compensation for wages and benefits lost, and reinstatement, for unlawful discharge. In addition, DCWP may impose on an employer found to have violated the ESSTA civil penalties not to exceed $500.00 for a first violation, $750.00 for a second violation within two years of the first violation, and $1,000.00 for each succeeding violation within two years of the previous violation. When an employer has a policy or practice of not providing or refusing to allow the use of safe and sick time to its employees, DCWP may seek penalties and relief on a per employee basis.

3. Pursuant to Admin. Code § 20-924.2, (a) where reasonable cause exists to believe that an employer is engaged in a pattern or practice of violations of the ESSTA, the Corporation Counsel may commence a civil action on behalf of the City in a court of competent jurisdiction by filing a complaint setting forth facts relating to such pattern or practice and requesting relief, which may include injunctive relief, civil penalties and any other appropriate relief. Nothing in § 20-924.2 prohibits DCWP from exercising its authority under section 20-924 or the Charter, provided that a civil action pursuant to § 20-924.2 shall not have previously been commenced.

H. *More Generous Polices and Other Legal Requirements.* Nothing in the ESSTA is intended to discourage, prohibit, diminish, or impair the adoption or retention of a more generous safe and sick time policy, or the obligation of an employer to comply with any contract, collective bargaining agreement, employment benefit plan or other agreement providing more generous safe and sick time. The ESSTA provides minimum requirements pertaining to safe and sick time and does not preempt, limit, or otherwise affect the applicability of any other law, regulation, rule, requirement, policy or standard that provides for greater accrual or use by employees of safe and sick leave or time, whether paid or unpaid, or that extends other protections to employees. The ESSTA may not be construed as creating or imposing any requirement in conflict with any federal or state law, rule or regulation.

New York City Mayoral Executive Order No. 39 Rider

City Fleet and Truck Safety Requirements for City Contractors

Version: 11/19/24

Section 1.01 Background

This rider is included in the Agreement and made a part thereof pursuant to the provisions of Mayoral Executive Order 39 of 2024.

Section 1.02 Definitions

A. Capitalized terms not otherwise defined in this rider shall have the meaning ascribed to them in the Agreement.

B. Agreement: The agreement between the City and the Contractor, to which this rider has been added and made a part.

C. City-contracted Vehicle means a Truck (as hereinafter defined) or any other motor vehicle that the Contractor anticipates providing in accordance with this Agreement or using in performing its obligations under this Agreement on a weekly or more frequent basis[1]. This includes those vehicles anticipated to be provided or used by subcontractors to fulfill the scope of a subcontract for work to be performed under a contract that is subject to the Executive Order, regardless of monetary value of the subcontract, if the vehicle is utilized on a weekly or more frequent basis.

D. Contracting Agency: the City agency or office through which the City of New York has entered into this Agreement.

[1] The following vehicles are not considered City-contracted vehicles and are thus not subject to Executive Order 39: any motor vehicle or truck that is utilized pursuant to (1) contracts registered prior to July 1, 2024, including the renewal, extension, or modification of such contracts; (2) an agency on-call emergency contract; (3) an emergency procurement made pursuant to section 3-06 of title 9 of the Rules of the City of New York or pursuant to an executive order of the Mayor or Governor issued under section 24 or section 29-A of the New York State Executive Law; (4) intergovernmental contracts; (5) government-to-government contracts between the City and any State or Federal government agency; and (6) a contract for utilities, as identified in subdivision (b) of section 825 of the New York City Charter.

E. Contractor: the entity providing services under this Agreement.

F. Executive Order: Mayoral Executive Order 39 of 2024, as it may be amended.

G. High Vision Truck: A Truck with a cab-over or cab-forward design wherein the driver sits in front of the front axle as opposed to conventional cab design wherein the engine and front axle are in front of the driver. The distance from the forward of the center of the vehicle bumper at which the driver can see the top of a 3-foot cone shall not exceed eight feet and the distance beyond the exterior of the passenger side door at which the driver can first see the top of the 4-foot cone shall not exceed six feet.

H. Registration: Registration of this Agreement pursuant to Section 328 of the New York City Charter.

I. Telematics: Automatic vehicle location systems that track vehicle location and speed and alert the driver and another designated person(s) to such location and speed in real time.

J. Truck: A City-contracted Vehicle with a manufacturer's gross vehicle weight rating exceeding 10,000 pounds. The term does not include off-road construction vehicles.

K. Truck Surround Cameras: A system of cameras, sensors, and alerts placed on a Truck that provides a Truck operator with a full view of all four sides of the Truck.

L. Vehicle Safety Plan: A plan with regard to City-contracted Vehicles, approved by the Contracting Agency, that includes the components listed in Section 2.03(A) through (F) of this rider.

Section 2.01 Vehicle Requirements

All City-contracted Vehicles shall conform to the following requirements:

A. Truck Surround Cameras: All Trucks, other than High Vision Trucks, shall be outfitted with truck surround cameras in accordance with the following schedule:
   a. Contracts involving 10 or fewer Trucks: No later than 12 months from Registration.
   b. Contracts involving more than 10 Trucks: No later than 18 months from Registration.
   c. New or replacement Truck acquired after work under this Agreement has begun: Truck must be outfitted with Truck Surround Cameras within 12 months from the date of first using such Truck.
   d. Contractor must submit to the Contracting Agency photographic and purchase order evidence, that is satisfactory to the Contracting Agency, of compliance with this Paragraph (A).

B. Truck Side-guards: Contractor shall provide side-guards for City-contracted Vehicles as applicable pursuant to Section 6-141 of the New York City Administrative Code.

C. Telematics: All City-contracted Vehicles must be installed with Telematics. Data gathered by Telematics must be made available in a manner that is satisfactory to the Contracting Agency.

Section 2.02 Safety Requirements

Contractor shall provide the following:

A. Licensing: Contractors shall ensure proper licensing for all drivers who operate City-contracted Vehicles. Contractors shall ensure that all drivers operating City-contracted Vehicles are enrolled in the New York State License Notification System (LENS) and that all out-of-state licenses are being monitored by Contractor. Contractor must notify the Contracting Agency of any license suspensions and/or arrests tied to unsafe or illegal vehicle operation by any drivers of City-contracted Vehicles.

B. Training: Contractor must provide the Contracting Agency documentation, satisfactory to the Contracting Agency, showing:
    a. That all drivers of City-contracted Vehicles have taken a New York State approved defensive driving class within six months after Registration; or
    b. That all drivers of City-contracted Vehicles have attended a New York State-approved defensive driving class within 3 years prior to Registration; or
    c. That all drivers of City-contracted Vehicles have received alternative safe driver training acceptable to the Contracting Agency that is documented to the satisfaction of the Contracting agency.

C. Crash tracking: Contractors must notify the Contracting Agency of any and all collisions that take place involving City-contracted Vehicles while performing services under this Agreement.

Section 2.03 Vehicle Safety Plan

Within one month after Registration, the Contractor must submit, for review and approval, to Contracting Agency, at the address set forth in the Agreement for notices to the City, and DCAS Fleet (C/O Chief Fleet Management Officer, 23rd Floor South, Municipal Building, 1 Centre Street, NY, NY 10007) a proposed vehicle safety plan that shall include at the minimum the components listed in Paragraphs (A) through (E) below. If directed by the Contracting Agency,

Contractor shall revise said proposed vehicle safety plan in accordance with the directions of the Contracting Agency, and until the Contracting Agency issues its approval thereof, Contractor shall submit a revised proposed vehicle safety plan to the Contracting Agency in each case, within 15 days after receipt by Contractor of directions to that effect from the Contracting Agency. Upon approval of the proposed vehicle safety plan, said proposed plan shall be considered the Vehicle Safety Plan and Contractor shall comply with the terms thereof. Each second anniversary of the approval of the Vehicle Safety Plan the Contractor shall submit an update thereof. The Vehicle Safety Plan shall include at the minimum the following components:

A. Vehicle List: List of City-contracted Vehicles, including the year, make, model, VIN and license plate number of each City-contracted Vehicle;

B. Safety Training: Documentation showing that all drivers of City-contracted Vehicles have completed the training detailed in section 2.02(B) of this Rider;

C. Technology: A list of all relevant technology investments installed on City-contracted vehicles, including but not limited to the technology listed in section 2.01 of this Rider;

D. Crash Tracking: An explanation of Contractor's process of monitoring and reviewing collisions including plans to notify Contracting Agency of collisions that take place while performing services under this Agreement;

E. Corrective Action: A corrective action program for drivers of City-contracted Vehicles that engage in unsafe or dangerous driving behaviors and license monitoring; and

F. Additional Safety Measures: Contractor must indicate if there are any additional safety technologies, safety practices, training, or other procedures that are utilized for City-contracted Vehicles during the term of this Agreement.

Section 3.01 Liquidated Damages

A. Contractor acknowledges that its failure to comply with the provisions of this Vehicle Safety Plan will cause loss and damage to the City, the precise extent of which is difficult to ascertain in monetary terms. For this reason, the parties desire to provide fair and reasonable compensation to the City for such losses, which compensation shall not be construed as a penalty. It is therefore agreed that, in addition to any other liquidated damages that the Contractor shall be required to pay to the City in accordance with the provisions of the Agreement, Contractor shall pay to the City the following:
    a. The sum of $500.00 for each instance of a failure by the Contractor to submit a Vehicle Safety Plan in accordance with the provisions of Section 2.03.

b. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.02(A) [Licensing].
c. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.02(B) [Training].
d. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.02(C) [Crash Tracking].
e. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.01(C) [Telematics].
f. The sum of $3,000 for each instance of a failure by the Contractor to comply with the provisions of Section 2.01(A).
g. The Contracting Agency will provide at least 5 working days of notice to the Contractor and opportunity to rectify before implementing these liquidated damages.

B. Liquidated damages received pursuant to this Agreement are not intended to be nor shall they be treated as either a partial or full waiver or discharge of the City's right to indemnification, or the Contractor's obligation to indemnify the City, or to any other remedy provided for in this Agreement or by Law. The City may deduct and retain out of the monies which may become due under this Agreement, the amount of any such liquidated damages; and in case the amount which may become due hereunder shall be less than the amount of liquidated damages suffered by the City, the Contractor shall be liable to pay the difference.

CITY OF NEW YORK

STANDARD CONSTRUCTION CONTRACT

March 2017

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CITY OF NEW YORK STANDARD CONSTRUCTION CONTRACT

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WITNESSETH:

The parties, in consideration of the mutual agreements contained herein, agree as follows:

CHAPTER I: THE CONTRACT AND DEFINITIONS

ARTICLE 1. THE CONTRACT

1.1 Except for titles, subtitles, headings, running headlines, tables of contents and indices (all of which are printed herein merely for convenience), the following, except for such portions thereof as maybe specifically excluded, shall be deemed to be part of this **Contract**:

1.1.1 All provisions required by law to be inserted in this **Contract**, whether actuallyinserted or not;

1.1.2 The Contract Drawings and Specifications;

1.1.3 The General Conditions and Special Conditions, if any;

1.1.4 The **Contract**;

1.1.5 The Information for Bidders; Request for Proposals; Notice of Solicitation andProposal For Bids; Bid or Proposal, and, if used, the Bid Booklet;

1.1.6 All Addenda issued prior to the receipt of the bids; the Notice of Award; Performance and Payment Bonds, if required; and the Notice to Proceed or the Order to Work.

1.2 Should any conflict occur in or between the Drawings and Specifications, the **Contractor** shall be deemed to have estimated the most expensive way of doing the **Work**, unless the **Contractor** shall have asked for and obtained a decision in writing from the **Commissioner** of the **Agency** that is entering into this **Contract**, before the submission of its bid, as to what shall govern.

ARTICLE 2. DEFINITIONS

2.1 The following words and expressions, or pronouns used in their stead, shall, wherever they appear in this Contract, be construed as follows, unless a different meaning is clear from the context:

2.1.1 **"Addendum"** or **"Addenda"** shall mean the additional Contract provisions and/or technical clarifications issued in writing by the Commissioner prior to the receipt of bids.

2.1.2 **"Agency"** shall mean a city, county, borough or other office, position, department, division, bureau, board or commission, or a corporation, institution or agency of government, the expenses of which are paid in whole or in part from the City treasury.

2.1.3 **"Agency Chief Contracting Officer" (ACCO)** shall mean a person delegated authority by the Commissioner to organize and supervise the procurement activity of subordinate Agency staff in conjunction with the CCPO, or his/her duly authorized representative.

2.1.4 **"Allowance"** shall mean a sum of money which the Agency may include in the total amount of the Contract for such specific contingencies as the Agency believes may be necessary to complete the Work, *e.g.*, lead or asbestos remediation, and for which the Contractor will be paid on the basis of stipulated unit prices or a formula set forth in the Contract or negotiated between the parties provided, however, that if the Contractor is not directed to use the Allowance, the Contractor shall have no right to such money and it shall be deducted from the total amount of the Contract.

2.1.5 **"City"** shall mean the City of New York.

2.1.6 **"City Chief Procurement Officer" (CCPO)** shall mean a person delegated authority by the Mayor to coordinate and oversee the procurement activity of Mayoral agency staff, including the ACCO and any offices which have oversight responsibility for the procurement of construction, or his/her duly authorized representative.

2.1.7 **"Commissioner"** shall mean the head of the Agency that has entered into this Contract, or his/her duly authorized representative.

2.1.8 **"Comptroller"** shall mean the Comptroller of the City of New York.

2.1.9 **"Contract"** or **"Contract Documents"** shall mean each of the various parts of the contract referred to in Article 1 hereof, both as a whole and severally.

2.1.10 **"Contract Drawings"** shall mean only those drawings specifically entitled as such and listed in the Specifications or in any Addendum, or any drawings furnished by the Commissioner, pertaining or supplemental thereto.

2.1.11 **"Contract Work"** shall mean everything required to be furnished and done by the Contractor by any one or more of the parts of the Contract referred to in Article 1, except Extra Work as hereinafter defined.

2.1.12 **"Contractor"** shall mean the entity which executed this Contract, whether a corporation, firm, partnership, joint venture, individual, or any combination thereof, and its, their, his/her successors, personal representatives, executors, administrators, and assigns, and any person, firm, partnership, joint venture, individual, or corporation which shall at any time be substituted in the place of the Contractor under this Contract.

2.1.13 **"Days"** shall mean calendar days, except where otherwise specified.

2.1.14 **"Engineer"** or **"Architect"** or **"Project Manager"** shall mean the person so designated in writing by the Commissioner in the Notice to Proceed or the Order to Work to act as such in relation to this Contract, including a private Architect or Engineer or Project Manager, as the case may be. Subject to written approval by the Commissioner, the Engineer, Architect or Project Manager may designate an authorized representative.

2.1.15 **"Engineering Audit Officer" (EAO)** shall mean the person so designated by the Commissioner to perform responsible auditing functions hereunder.

2.1.16 **"Extra Work"** shall mean Work other than that required by the Contract at the time of award which is authorized by the Commissioner pursuant to Chapter VI of this Contract.

2.1.17 **"Federal-Aid Contract"** shall mean a contract in which the United States (federal) Government provides financial funding as so designated in the Information for Bidders.

2.1.18 **"Final Acceptance"** shall mean final written acceptance of all the Work by the Commissioner, a copy of which shall be sent to the Contractor.

2.1.19 **"Final Approved Punch List"** shall mean a list, approved pursuant to Article 14.2.2, specifying those items of Work to be completed by the Contractor after Substantial Completion and dates for the completion of each item of Work.

2.1.20 **"Law"** or **"Laws"** shall mean the Constitution of the State of New York, the New York City Charter, the New York City Administrative Code, a statute of the United States or of the State of New York, a local law of the City of New York, any ordinance, rule or regulation having the force of law, or common law.

2.1.21 **"Materialman"** shall mean any corporation, firm, partnership, joint venture, or individual, other than employees of the Contractor, who or which contracts with the Contractor or any Subcontractor, to fabricate or deliver, or who actually fabricates or delivers, plant, materials or equipment to be incorporated in the Work.

2.1.22 **"Means and Methods of Construction"** shall mean the labor, materials, temporary structures, tools, plant, and construction equipment, and the manner and time of their use, necessary to accomplish the result intended by this Contract.

2.1.23**"Notice to Proceed" or "Order to Work"** shall mean the written notice issued bythe Commissioner specifying the time for commencement of the Work and the Engineer, Architect or Project Manager.

2.1.24 **"Other Contractor(s)"** shall mean any contractor (other than the entity which executed this Contract or its Subcontractors) who or which has a contract with the City for work on or adjacent to the building or Site of the Work.

2.1.25 **"Payroll Taxes"** shall mean State Unemployment Insurance (SUI), Federal Unemployment Insurance (FUI), and payments pursuant to the Federal Insurance Contributions Act (FICA).

2.1.26 **"Project"** shall mean the public improvement to which this Contract relates.

2.1.27 **"Procurement Policy Board" (PPB)** shall mean the Agency of the City of New York whose function is to establish comprehensive and consistent procurement policies and rules which shall have broad application throughout the City.

2.1.28 **"Required Quantity"** in a unit price Contract shall mean the actual quantity of any item of Work or materials which is required to be performed or furnished in order to comply with the Contract.

2.1.29 **"Resident Engineer"** shall mean the representative of the Commissioner duly designated by the Commissioner to be his/her representative at the site of the Work.

2.1.30 **"Site"** shall mean the area upon or in which the Contractor's operations are carried on, and such other areas adjacent thereto as may be designated as such by the Engineer.

2.1.31 **"Small Tools"** shall mean items that are ordinarily required for a worker's job

function, including but not limited to, equipment that ordinarily has no licensing, insurance or substantive storage costs associated with it; such as circular and chain saws, impactdrills, threaders, benders, wrenches, socket tools, etc.

2.1.32 **"Specifications"** shall mean all of the directions, requirements, and standards of performance applying to the Work as hereinafter detailed and designated under the Specifications.

2.1.33 **"Subcontractor"** shall mean any person, firm or corporation, other than employees of the Contractor, who or which contracts with the Contractor or with its subcontractors to furnish, or actually furnishes labor, or labor and materials, or labor and equipment, or superintendence, supervision and/or management at the Site. Wherever the word Subcontractor appears, it shall also mean sub-Subcontractor.

2.1.34 **"Substantial Completion"** shall mean the written determination by the Engineer that the Work required under this Contract is substantially, but not entirely, complete and the approval of the **Final Approved Punch List**.

2.1.35 **"Work"** shall mean all services required to complete the Project in accordance with the Contract Documents, including without limitation, labor, material, superintendence, management, administration, equipment, and incidentals, and obtaining any and all permits, certifications and licenses as may be necessary and required to complete the Work, and shall include both Contract Work and Extra Work.

CHAPTER II: THE WORK AND ITS PERFORMANCE

ARTICLE 3. CHARACTER OF THE WORK

3.1 Unless otherwise expressly provided in the **Contract Drawings**, **Specifications,** and **Addenda**, the **Work** shall be performed in accordance with the best modern practice, utilizing, unless otherwise specified in writing, new and unused materials of standard first grade quality and workmanship anddesign of the highest quality, to the satisfaction of the **Commissioner**.

ARTICLE 4. MEANS AND METHODS OF CONSTRUCTION

4.1 Unless otherwise expressly provided in the **Contract Drawings**, **Specifications,** and **Addenda**, the **Means and Methods of Construction** shall be such as the **Contractor** may choose; subject, however, to the **Engineer's** right to reject the **Means and Methods of Construction** proposed by the **Contractor** which in the opinion of the **Engineer**:

4.1.1 Will constitute or create a hazard to the **Work**, or to persons or property; or

4.1.2 Will not produce finished **Work** in accordance with the terms of the **Contract**; or

4.1.3 Will be detrimental to the overall progress of the **Project**.

4.2 The **Engineer's** approval of the **Contractor's Means and Methods of Construction**, orhis/her failure to exercise his/her right to reject such means or methods, shall not relieve the **Contractor** of its obligation to complete the **Work** as provided in this **Contract**; nor shall the exercise of such rightto reject

create a cause of action for damages.

ARTICLE 5. COMPLIANCE WITH LAWS

5.1 The **Contractor** shall comply with all **Laws** applicable to this **Contract** and to the **Work** to be done hereunder.

5.2 Procurement Policy Board Rules: This **Contract** is subject to the Rules of the **PPB** ("**PPB** Rules") in effect at the time of the bid opening for this **Contract**. In the event of a conflict between the **PPB** Rules and a provision of this **Contract**, the **PPB** Rules shall take precedence.

5.3 Noise Control Code provisions.

5.3.1 In accordance with the provisions of Section 24-216(b) of the Administrative Code of the **City** ("Administrative Code"), Noise Abatement Contract Compliance, devices and activities which will be operated, conducted, constructed or manufactured pursuant to this **Contract** and which are subject to the provisions of the **City** Noise Control Code shall be operated, conducted, constructed, or manufactured without causing a violation of the Administrative Code. Such devices and activities shall incorporate advances in the art of noise control development for the kind and level of noise emitted or produced by such devices and activities, in accordance with regulations issued by the **Commissioner** of the **City** Department of Environmental Protection.

5.3.2 The **Contractor** agrees to comply with Section 24-219 of the Administrative Code and implementing rules codified at 15 Rules of the City of New York ("RCNY") Section 28-100 *et seq*. In accordance with such provisions, the **Contractor**, if the **Contractor** is the responsible party under such regulations, shall prepare and post a Construction Noise Mitigation Plan at each **Site**, in which the **Contractor** shall certify that all construction tools and equipment have been maintained so that they operate at normal manufacturers operating specifications. If the **Contractor** cannot make this certification, it must have in place an Alternative Noise Mitigation Plan approved by the **City** Department of Environmental Protection. In addition, the **Contractor**'s certified Construction Noise Mitigation Plan is subject inspection by the **City** Department of Environmental Protection in accordance with Section 28-101 of Title 15 of RCNY. No **Contract Work** may take place at a **Site** unless there is a Construction Noise Mitigation Plan or approved Alternative Noise Mitigation Plan in place. In addition, the **Contractor** shall create and implement a noise mitigation training program. Failure to comply with these requirements may result in fines and other penalties pursuant to the applicable provisions of the Administrative Code and RCNY.

5.4 Ultra Low Sulfur Diesel Fuel: In accordance with the provisions of Section 24-163.3 of the Administrative Code, the **Contractor** specifically agrees as follows:

5.4.1 Definitions. For purposes of this Article 5.4, the following definitions apply:

5.4.1(a) "Contractor" means any person or entity that enters into a Public Works Contract with a **City Agency**, or any person or entity that enters into an agreement with such person or entity, to perform work or provide labor or services related to such Public Works Contract.

5.4.1(b) "Motor Vehicle" means any self-propelled vehicle designed for transporting

persons or property on a street or highway.

5.4.1(c) "Nonroad Engine" means an internal combustion engine (including the fuel system) that is not used in a Motor Vehicle or a vehicle used solely for competition,or that is not subject to standards promulgated under Section 7411 or Section 7521 of Title 42 of the United States Code, except that this term shall apply to internal combustion engines used to power generators, compressors or similar equipment used in any construction program or project.

5.4.1(d) "Nonroad Vehicle" means a vehicle that is powered by a Nonroad Engine, fifty (50) horsepower and greater, and that is not a Motor Vehicle or a vehicle used solely for competition, which shall include, but not be limited to, excavators, backhoes, cranes, compressors, generators, bulldozers, and similar equipment, except that this term shall not apply to horticultural maintenance vehicles used for landscaping purposes that are powered by a Nonroad Engine of sixty-five (65) horsepower or less and that are not used in any construction program or project.

5.4.1(e) "Public Works Contract" means a contract with a **City Agency** for a construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge; a contract with a **City Agency** for the preparation for any construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge; or a contract with a **City Agency** for any final work involved in the completion of any construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge.

5.4.1(f) "Ultra Low Sulfur Diesel Fuel" means diesel fuel that has a sulfur content of no more than fifteen parts per million (15 ppm).

5.4.2 Ultra Low Sulfur Diesel Fuel

5.4.2(a) All **Contractors** shall use Ultra Low Sulfur Diesel Fuel in diesel-powered Nonroad Vehicles in the performance of this **Contract**.

5.4.2(b) Notwithstanding the requirements of Article 5.4.2(a), **Contractors** may use diesel fuel that has a sulfur content of no more than thirty parts per million (30 ppm)to fulfill the requirements of this Article 5.4.2, where the Commissioner of the **City** Department of Environmental Protection ("DEP Commissioner") has issued a determination that a sufficient quantity of Ultra Low Sulfur Diesel Fuel is not available to meet the needs of **Agencies** and **Contractors**. Any such determination shall expire after six (6) months unless renewed.

5.4.2(c) **Contractors** shall not be required to comply with this Article 5.4.2 where the **City Agency** letting this **Contract** makes a written finding, which is approved, in writing, by the DEP Commissioner, that a sufficient quantity of Ultra Low Sulfur Diesel Fuel, or diesel fuel that has a sulfur content of no more than thirty parts per million (30 ppm) is not available to meet the requirements of Section 24-163.3 of the Administrative Code, provided that such **Contractor** in its fulfillment of the requirements of this **Contract**, to the extent practicable, shall use whatever quantity of Ultra Low Sulfur Diesel Fuel or diesel fuel that has a sulfur content of no more than thirty parts per

million (30 ppm) is available. Any finding made pursuant to this Article 5.4.2(c) shall expire after sixty (60) **Days**, at which time the requirements of this Article 5.4.2 shall be in full force and effect unless the **City Agency** renews the finding in writing and such renewal is approved by the DEP Commissioner.

5.4.2(d) **Contractors** may check on determinations and approvals issued by the DEP Commissioner pursuant to Section 24-163.3 of the Administrative Code, if any, at www.dep.nyc.gov or by contacting the **City Agency** letting this **Contract**.

5.4.2(e) The requirements of this Article 5.4.2 do not apply where they are precluded by federal or State funding requirements or where the **Contract** is an emergency procurement.

5.4.3 Best Available Technology

5.4.3(a) All **Contractors** shall utilize the best available technology for reducing the emission of pollutants for diesel-powered Nonroad Vehicles in the performance of this **Contract**. For determinations of best available technology for each type of diesel-powered Nonroad Vehicle, **Contractors** shall comply with the regulations of the **City** Department of Environmental Protection, as and when adopted, Chapter 14of Title 15 of the Rules of the City of New York (RCNY). The **Contractor** shall fully document all steps in the best available technology selection process and shall furnish such documentation to the **City Agency** or the DEP Commissioner upon request. The **Contractor** shall retain all documentation generated in the best available technology selection process for as long as the selected best available technology is in use.

5.4.3(b) No **Contractor** shall be required to replace best available technology for reducing the emission of pollutants or other authorized technology utilized for a diesel-powered Nonroad Vehicle in accordance with the provisions of this Article 5.4.3 within three (3) years of having first utilized such technology for such vehicle.

5.4.3(c) This Article 5.4.3 shall not apply to any vehicle used to satisfy the requirements of a specific Public Works Contract for fewer than twenty (20) **Days**.

5.4.3(d) The **Contractor** shall not be required to comply with this Article 5.4.3 with respect to a diesel-powered Nonroad Vehicle under the following circumstances:

5.4.3(d)(i) Where the **City Agency** makes a written finding, which is approved, in writing, by the DEP Commissioner, that the best available technology for reducing the emission of pollutants as required by this Article 5.4.3 is unavailable for such vehicle, the **Contractor** shall use whatever technology for reducing the emission of pollutants, if any, is available and appropriate for such vehicle.

5.4.3(d)(ii) Where the DEP Commissioner has issued a written waiver based upon the Contractor having demonstrated to the DEP Commissioner that the use of the best available technology for reducing the emission of pollutants might endanger the operator of such vehicle or those working near such vehicle, due to engine malfunction, the **Contractor** shall use whatever technology for reducing the emission of pollutants, if any, is available and appropriate for such vehicle, which would not endanger the operator of such vehicle or those working near such vehicle.

5.4.3(d)(iii) In determining which technology to use for the purposes of Articles 5.4.3(d)(i) and 5.4.3(d)(ii) above, the **Contractor** shall primarily consider the reduction in emissions of particulate matter and secondarily consider the reduction in emissions of nitrogen oxides associated with the use of such technology, which shall in no event result in an increase in the emissions of either such pollutant.

5.4.3(d)(iv) The **Contractor** shall submit requests for a finding or a waiver pursuant to this Article 5.4.3(d) in writing to the DEP Commissioner, with a copy to the **ACCO** of the **City Agency** letting this **Contract**. Any finding or waiver made or issued pursuant to Articles 5.4.3(d)(i) and 5.4.3(d)(ii) above shall expire after one hundred eighty (180) **Days**, at which time the requirements of Article 5.4.3(a) shall be in full force and effect unless the **City Agency** renews the finding, in writing, and the DEP Commissioner approves such finding, in writing, or the DEP Commissioner renews the waiver, in writing.

5.4.3(e) The requirements of this Article 5.4.3 do not apply where they are precluded by federal or State funding requirements or where the **Contract** is an emergency procurement.

5.4.4 Section 24-163 of the Administrative Code. The **Contractor** shall comply with Section 24-163 of the Administrative Code related to the idling of the engines of motor vehicles while parking.

5.4.5 Compliance

5.4.5(a) The **Contractor's** compliance with Article 5.4 may be independently monitored. If it is determined that the **Contractor** has failed to comply with any provision of Article 5.4, any costs associated with any independent monitoring incurred by the **City** shall be reimbursed by the **Contractor**.

5.4.5(b) Any **Contractor** who violates any provision of Article 5.4, except as provided in Article 5.4.5(c) below, shall be liable for a civil penalty between the amounts of one thousand ($1,000) and ten thousand ($10,000) dollars, in addition to twice the amount of money saved by such **Contractor** for failure to comply with Article 5.4.

5.4.5(c) No **Contractor** shall make a false claim with respect to the provisions of Article 5.4 to a **City Agency**. Where a **Contractor** has been found to have done so, such **Contractor** shall be liable for a civil penalty of twenty thousand ($20,000) dollars, in addition to twice the amount of money saved by such **Contractor** in association with having made such false claim.

5.4.6 Reporting

5.4.6(a) For all Public Works Contracts covered by this Article 5.4, the **Contractor** shall report to the **City Agency** the following information:

5.4.6(a)(i) The total number of diesel-powered Nonroad Vehicles used to fulfill the requirements of this Public Works Contract;

5.4.6(a)(ii) The number of such Nonroad Vehicles that were powered by Ultra Low Sulfur Diesel Fuel;

5.4.6(a)(iii) The number of such Nonroad Vehicles that utilized the best available technology for reducing the emission of pollutants, including a breakdown by vehicle model and the type of technology;

5.4.6(a)(iv) The number of such Nonroad Vehicles that utilized such other authorized technology in accordance with Article 5.4.3, including a breakdown by vehicle model and the type of technology used for each such vehicle;

5.4.6(a)(v) The locations where such Nonroad Vehicles were used; and

5.4.6(a)(vi) Where a determination is in effect pursuant to Article 5.4.2(b) or 5.4.2(c), detailed information concerning the **Contractor's** efforts to obtain Ultra Low Sulfur Diesel Fuel or diesel fuel that has a sulfur content of no more than thirty parts per million (30 ppm).

5.4.6(b) The **Contractor** shall submit the information required by Article 5.4.6(a) at the completion of **Work** under the Public Works Contract and on a yearly basis no later than August 1 throughout the term of the Public Works Contract. The yearly report shall cover **Work** performed during the preceding fiscal year (July 1 - June 30).

5.5 Ultra Low Sulfur Diesel Fuel. In accordance with the Coordinated Construction Act for Lower Manhattan, as amended:

5.5.1 Definitions. For purposes of this Article 5.5, the following definitions apply:

5.5.1(a) "Lower Manhattan" means the area to the south of and within the following lines: a line beginning at a point where the United States pierhead line in the Hudson River as it exists now or may be extended would intersect with the southerly line of West Houston Street in the Borough of Manhattan extended, thence easterly along the southerly side of West Houston Street to the southerly side of Houston Street, thence easterly along the southerly side of Houston Street to the southerly side of East Houston Street, thence northeasterly along the southerly side of East Houston Street to the point where it would intersect with the United States pierhead line in the East River as it exists now or may be extended, including tax lots within or immediately adjacent thereto.

5.5.1(b) "Lower Manhattan Redevelopment Project" means any project in Lower Manhattan that is funded in whole or in part with federal or State funding, or any project intended to improve transportation between Lower Manhattan and the two air terminals in the **City** known as LaGuardia Airport and John F. Kennedy International Airport, or between Lower Manhattan and the air terminal in Newark known as Newark Liberty International Airport, and that is funded in whole or in part with federal funding.

5.5.1(c) "Nonroad Engine" means an internal combustion engine (including the fuel system) that is not used in a Motor Vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under Section 7411 or Section 7521 of Title 42 of the United States Code, except that this term shall apply to internal combustion engines used to power generators, compressors or similar equipment used in any construction program or project.

5.5.1(d) "Nonroad Vehicle" means a vehicle that is powered by a Nonroad Engine, fifty (50) horsepower (HP) and greater, and that is not a Motor Vehicle or a vehicle used

solely for competition, which shall include, but not be limited to, excavators, backhoes, cranes, compressors, generators, bulldozers, and similar equipment, except that this terms shall not apply to horticultural maintenance vehicles used for landscaping purposes that are powered by a Nonroad Engine of sixty-five (65) HP or less and that are not used in any construction program or project.

5.5.1(e) "Ultra Low Sulfur Diesel Fuel" means diesel fuel that has a sulfur content of no more than fifteen parts per million (15 ppm).

5.5.2 Requirements. **Contractors** and **Subcontractors** are required to use only Ultra Low Sulfur Diesel Fuel to power the diesel-powered Nonroad Vehicles with engine HP rating of fifty (50) HP and above used on a Lower Manhattan Redevelopment Project and, where practicable, to reduce the emission of pollutants by retrofitting such Nonroad Vehicles with oxidation catalysts, particulate filters, or technology that achieves lowest particulate matter emissions.

5.6 Pesticides. In accordance with Section 17-1209 of the Administrative Code, to the extent that the **Contractor** or any **Subcontractor** applies pesticides to any property owned or leased by the **City**, the **Contractor,** and any **Subcontractor** shall comply with Chapter 12 of the Administrative Code.

5.7 Waste Treatment, Storage, and Disposal Facilities and Transporters. In connection withthe **Work**, the **Contractor** and any **Subcontractor** shall use only those waste treatment, storage, and disposal facilities and waste transporters that possess the requisite license, permit or other governmental approval necessary to treat, store, dispose, or transport the waste, materials or hazardous substances.

5.8 Environmentally Preferable Purchasing. The **Contractor** shall ensure that products purchased or leased by the **Contractor** or any **Subcontractor** for the **Work** that are not specified by the **City** or are submitted as equivalents to a product specified by the **City** comply with the requirements of the New York City Environmentally Preferable Purchasing Program contained in Chapter 11 of Title 43 of the RCNY, pursuant to Chapter 3 of Title 6 of the Administrative Code.

ARTICLE 6. INSPECTION

6.1 During the progress of the **Work** and up to the date of **Final Acceptance**, the **Contractor** shall at all times afford the representatives of the **City** every reasonable, safe, and proper facility for inspecting all **Work** done or being done at the **Site** and also for inspecting the manufacture or preparation of materials and equipment at the place of such manufacture or preparation.

6.2 The **Contractor's** obligation hereunder shall include the uncovering or taking down of finished **Work** and its restoration thereafter; provided, however, that the order to uncover, take down and restore shall be in writing, and further provided that if **Work** thus exposed proves satisfactory, and if the **Contractor** has complied with Article 6.1, such uncovering or taking down and restoration shall be considered an item of **Extra Work** to be paid for in accordance with the provisions of Article 26. If the **Work** thus exposed proves unsatisfactory, the **City** has no obligation to compensate the **Contractor** for the uncovering, taking down or restoration.

6.3 Inspection and approval by the **Commissioner**, the **Engineer**, **Project Manager**, or **Resident Engineer**, of finished **Work** or of **Work** being performed, or of materials and equipment at the place of manufacture or preparation, shall not relieve the **Contractor** of its obligation to perform the **Work** in strict accordance with the **Contract**. Finished or unfinished **Work** not found to be in strict accordance with the

Contract shall be replaced as directed by the **Engineer**, even though such **Work** may have been previously approved and paid for. Such corrective **Work** is **Contract Work** and shall not be deemed **Extra Work**.

6.4 Rejected **Work** and materials shall be promptly taken down and removed from the **Site**, which must at all times be kept in a reasonably clean and neat condition.

ARTICLE 7. PROTECTION OF WORK AND OF PERSONS AND PROPERTY; NOTICESAND INDEMNIFICATION

7.1 During the performance of the **Work** and up to the date of **Final Acceptance**, the **Contractor** shall be under an absolute obligation to protect the finished and unfinished **Work** against any damage, loss, injury, theft and/or vandalism and in the event of such damage, loss, injury, theft and/or vandalism,it shall promptly replace and/or repair such **Work** at the **Contractor's** sole cost and expense, as directed by the **Resident Engineer**. The obligation to deliver finished **Work** in strict accordance with the **Contract** prior to **Final Acceptance** shall be absolute and shall not be affected by the **Resident Engineer's** approval of, or failure to prohibit, the **Means and Methods of Construction** used by the **Contractor**.

7.2 During the performance of the **Work** and up to the date of **Final Acceptance**, the **Contractor** shall take all reasonable precautions to protect all persons and the property of the **City** and of others from damage, loss or injury resulting from the **Contractor's**, and/or its **Subcontractors'** operations under this **Contract.** The **Contractor's** obligation to protect shall include the duty to provide, place or replace, and adequately maintain at or about the **Site** suitable and sufficient protection such as lights, barricades, and enclosures.

7.3 The **Contractor** shall comply with the notification requirements set forth below in the event of any loss, damage or injury to **Work**, persons or property, or any accidents arising out of the operations of the **Contractor** and/or its **Subcontractors** under this **Contract**.

7.3.1 The **Contractor** shall make a full and complete report in writing to the **Resident Engineer** within three (3) **Days** after the occurrence.

7.3.2 The **Contractor** shall also send written notice of any such event to all insurance carriers that issued potentially responsive policies (including commercial general liability insurance carriers for events relating to the **Contractor**'s own employees) no later than twenty (20) days after such event and again no later than twenty (20) days after the initiation of any claim and/or action resulting therefrom. Such notice shall contain the following information: the number of the insurance policy, the name of the Named Insured, the date and location of the incident, and the identity of the persons injured or property damaged. For any policy on which the **City** and/or the **Engineer**, **Architect**, or **Project Manager** are Additional Insureds, such notice shall expressly specify that "this notice is being given on behalf of the City of New York as Additional Insured, such other AdditionalInsureds, as well as the Named Insured."

7.3.2(a) Whenever such notice is sent under a policy on which the **City** is an Additional Insured, the **Contractor** shall provide copies of the notice to the **Comptroller,** the **Commissioner** and the **City** Corporation Counsel. The copy to the **Comptroller** shall be sent to the Insurance Unit, NYC Comptroller's Office, 1 Centre Street – Room 1222, New York, New York, 10007. The copy to the **Commissioner** shall be sent to the address set forth in Schedule A of the General Conditions. The copy to the **City** Corporation Counsel shall be sent to Insurance Claims Specialist, Affirmative Litigation

Division, New York City Law Department, 100 Church Street, New York, New York 10007.

7.3.2(b) If the **Contractor** fails to provide any of the foregoing notices to anyappropriate insurance carrier(s) in a timely and complete manner, the **Contractor**shall indemnify the **City** for all losses, judgments, settlements, and expenses, including reasonable attorneys' fees, arising from an insurer's disclaimer of coverage citing late notice by or on behalf of the **City**.

7.4 To the fullest extent permitted by law, the **Contractor** shall defend, indemnify, and hold the **City**, its employees, and officials (the "Indemnitees") harmless against any and all claims (including but not limited to claims asserted by any employee of the **Contractor** and/or its **Subcontractors**) and costs and expenses of whatever kind (including but not limited to payment or reimbursement of attorneys' fees and disbursements) allegedly arising out of or in any way related to the operations of the **Contractor** and/or its **Subcontractors** in the performance of this **Contract** or from the **Contractor's** and/or its **Subcontractors'** failure to comply with any of the provisions of this **Contract** or of the **Law**. Such costs and expenses shall include all those incurred in defending the underlying claim and those incurred in connection with the enforcement of this Article 7.4 by way of cross-claim, third-party claim, declaratory action or otherwise. The parties expressly agree that the indemnification obligation hereunder contemplates (1) full indemnity in the event of liability imposed against the Indemnitees without negligence and solely by reason of statute, operation of **Law** or otherwise; and (2) partial indemnity in the event of any actual negligence on the part of the Indemnitees either causing orcontributing to the underlying claim (in which case, indemnification will be limited to any liability imposed over and above that percentage attributable to actual fault whether by statute, by operation of **Law**, or otherwise). Where partial indemnity is provided hereunder, all costs and expenses shall be indemnified on a pro rata basis.

7.4.1 Indemnification under Article 7.4 or any other provision of the **Contract** shall operate whether or not **Contractor** or its **Subcontractors** have placed and maintained the insurance specified under Article 22.

7.5 The provisions of this Article 7 shall not be deemed to create any new right of action in favor of third parties against the **Contractor** or the **City**.

CHAPTER III: TIME PROVISIONS

ARTICLE 8. COMMENCEMENT AND PROSECUTION OF THE WORK

8.1 The **Contractor** shall commence the **Work** on the date specified in the **Notice to Proceed** or the **Order to Work**. The time for performance of the **Work** under the **Contract** shall be computed from the date specified in the **Notice to Proceed** or the **Order to Work**. **TIME BEING OF THE ESSENCE** to the **City**, the **Contractor** shall thereafter prosecute the **Work** diligently, using such **Means and Methods of Construction** as are in accord with Article 4 herein and as will assure its completion not later than the date specified in this Contract, or on the date to which the time for completion may be extended.

ARTICLE 9. PROGRESS SCHEDULES

9.1 To enable the **Work** to be performed in an orderly and expeditious manner, the **Contractor**, within fifteen (15) **Days** after the **Notice to Proceed** or **Order to Work**, unless otherwise directed by the **Engineer**, shall submit to the **Engineer** a proposed progress schedule based on the Critical Path Methodin the form of

a bar graph or in such other form as specified by the **Engineer**, and monthly cash flow requirements, showing:

9.1.1 The anticipated time of commencement and completion of each of the variousoperations to be performed under this **Contract**; and

9.1.2 The sequence and interrelation of each of these operations with the others and with those of other related contracts; and

9.1.3 The estimated time required for fabrication or delivery, or both, of all materials and equipment required for the **Work**, including the anticipated time for obtaining required approvals pursuant to Article 10; and

9.1.4 The estimated amount in dollars the **Contractor** will claim on a monthly basis.

9.2 The proposed schedule shall be revised as directed by the **Engineer**, until finally approved by the **Engineer**, and after such approval, subject to the provisions of Article 11, shall be strictly adhered to by the **Contractor**.

9.3 If the **Contractor** shall fail to adhere to the approved progress schedule, or to the schedule as revised pursuant to Article 11, it shall promptly adopt such other or additional **Means and Methods of Construction**, at its sole cost and expense, as will make up for the time lost and will assure completion in accordance with the approved progress schedule. The approval by the **City** of a progress schedule which is shorter than the time allotted under the **Contract** shall not create any liability for the **City** if the approved progress schedule is not met.

9.4 The **Contractor** will not receive any payments until the proposed progress schedule is submitted.

ARTICLE 10. REQUESTS FOR INFORMATION OR APPROVAL

10.1 From time to time as the **Work** progresses and in the sequence indicated by the approved progress schedule, the **Contractor** shall submit to the **Engineer** a specific request in writing for each item of information or approval required by the **Contractor**. These requests shall state the latest date upon which the information or approval is actually required by the **Contractor**, and shall be submitted in a reasonable time in advance thereof to provide the **Engineer** a sufficient time to act upon such submissions, or any necessary re-submissions thereof.

10.2 The **Contractor** shall not have any right to an extension of time on account of delays due to the **Contractor's** failure to submit requests for the required information or the required approval in accordance with the above requirements.

ARTICLE 11. NOTICE OF CONDITIONS CAUSING DELAY AND DOCUMENTATION OF DAMAGES CAUSED BY DELAY

11.1 After the commencement of any condition which is causing or may cause a delay in completion of the **Work**, including conditions for which the **Contractor** may be entitled to an extension of time, the following notifications and submittals are required:

11.1.1 Within fifteen (15) **Days** after the **Contractor** becomes aware or reasonably should be

aware of each such condition, the **Contractor** must notify the **Resident Engineer** or **Engineer**, as directed by the **Commissioner**, in writing of the existence, nature and effect of such condition upon the approved progress schedule and the **Work**, and must state why and in what respects, if any, the condition is causing or may cause a delay. Such notice shall include a description of the construction activities that are or could be affected by the condition and may include any recommendations the **Contractor** may have to address the delay condition and any activities the **Contractor** may take to avoid or minimize the delay.

11.1.2 If the **Contractor** shall claim to be sustaining damages for delay as provided for in this Article 11,within forty-five (45) **Days** from the time such damages are first incurred for each such condition, the **Contractor** shall submit to the **Commissioner** a verified written statement of the details and estimates of the amounts of such damages, including categories of expected damages and projected monthly costs, together with documentary evidence of such damages as the **Contractor** may have at the time of submission ("statement of delay damages"), as further detailed in Article 11.6. The **Contractor** may submit the above statement within such additional time as may be granted by the **Commissioner** in writing upon written request therefor.

11.1.3 Articles 11.1.1 and 11.1.2 do not relieve the **Contractor** of its obligation to comply with the provisions of Article 44.

11.2 Failure of the **Contractor** to strictly comply with the requirements of Article 11.1.1 may, inthe discretion of the **Commissioner**, be deemed sufficient cause to deny any extension of time on account of delay arising out of such condition. Failure of the **Contractor** to strictly comply with the requirements of both Articles 11.1.1 and 11.1.2 shall be deemed a conclusive waiver by the **Contractor** of any and all claims for damages for delay arising from such condition and no right to recover on such claims shall exist.

11.3 When appropriate and directed by the **Engineer**, the progress schedule shall be revised by the **Contractor** until finally approved by the **Engineer**. The revised progress schedule must be strictly adhered to by the **Contractor**.

11.4 Compensable Delays

11.4.1 The **Contractor** agrees to make claim only for additional costs attributable to delayin the performance of this **Contrac**t necessarily extending the time for completion of the **Work** or resulting from acceleration directed by the **Commissioner** and required to maintain the progress schedule, occasioned solely by any act or omission to act of the **City** listed below. The **Contractor** also agrees that delay from any other cause shall be compensated, if at all, solely by an extension of time to complete the performance of the **Work**.

11.4.1.1 The failure of the **City** to take reasonable measures to coordinate and progress the **Work** to the extent required by the **Contract**, except that the City shall not be responsible for the **Contractor's** obligation to coordinate and progress the **Work** of its **Subcontractors**.

11.4.1.2 Unreasonable delays attributable to the review of shop drawings, the issuance of change orders, or the cumulative impact of change orders that were not brought about by any act or omission of the **Contractor**.

11.4.1.3 The unavailability of the **Site** caused by acts or omissions of the **City**..

11.4.1.4 The issuance by the **Engineer** of a stop work order that was not brought about through any act or omission of the **Contractor**.

11.4.1.5 Differing site conditions or environmental hazards that were neitherknown nor reasonably ascertainable on a pre-bid inspection of the **Site**or review

of the bid documents or other publicly available sources, and that are not ordinarily encountered in the **Project**'s geographical area or neighborhood or in the type of **Work** to be performed.

11.4.1.6 Delays caused by the **City's** bad faith or its willful, malicious, or grossly negligent conduct;

11.4.1.7 Delays not contemplated by the parties;

11.4.1.8 Delays so unreasonable that they constitute an intentional abandonment of the **Contract** by the **City**; and

11.4.1.9 Delays resulting from the **City's** breach of a fundamental obligation of the **Contract**.

11.4.2 No claim may be made for any alleged delay in **Substantial Completion** of the **Work** if the **Work** will be or is substantially completed by the date of **Substantial Completion** provided for in Schedule A unless acceleration has been directed by the **Commissioner** to meet the date of **Substantial Completion** set forth in Schedule A, or unless there is a provision in the **Contract** providing for additional compensation for early completion.

11.4.3 The provisions of this Article 11 apply only to claims for additional costs attributable to delay and do not preclude determinations by the **Commissioner** allowing reimbursements for additional costs for **Extra Work** pursuant to Articles 25 and 26 of this **Contract**. To the extent that any cost attributable to delay is reimbursed as part of a change order, no additional claim for compensation under this Article 11 shall be allowed.

11.5 Non-Compensable Delays. The **Contractor** agrees to make no claim for, and is deemed to have included in its bid prices for the various items of the **Contract**, the extra/additional costs attributable to any delays caused by or attributable to the items set forth below. For such items, the **Contractor** shall be compensated, if at all, solely by an extension of time to complete the performance of the **Work**, in accordance with the provisions of Article 13. Such extensions of time will be granted, if at all, pursuant to the grounds set forth in Article 13.3.

11.5.1 The acts or omissions of any third parties, including but not limited to **Other Contractors**, public/ governmental bodies (other than **City Agencies**), utilities or private enterprises, who are disclosed in the **Contract Documents** or are ordinarily encountered or generally recognized as related to the **Work**;

11.5.2 Any situation which was within the contemplation of the parties at the time of entering into the **Contract**, including any delay indicated or disclosed in the **Contract Documents** or that would be generally recognized by a reasonably prudent contractor as related to the nature of the **Work**, and/or the existence of any facility or appurtenance owned, operated or maintained by any third party, as indicated or disclosed in the **Contract Documents** or ordinarily encountered or generally recognized as related to the nature of the **Work**;

11.5.3 Restraining orders, injunctions or judgments issued by a court which were caused by a Contractor's submission, action or inaction or by a Contractor's **Means and Methods of Construction**, or by third parties, unless such order, injunction or judgment was the result of an act or omission by the **City**;

11.5.4 Any labor boycott, strike, picketing, lockout or similar situation;

11.5.5 Any shortages of supplies or materials, or unavailability of equipment, required by the **Contract Work**;

11.5.6 Climatic conditions, storms, floods, droughts, tidal waves, fires, hurricanes, earthquakes, landslides or other catastrophes or acts of God, or acts of war or of the public enemy or terrorist acts, including the **City's** reasonable responses thereto; and

11.5.7 **Extra Work** which does not significantly affect the overall completion of the **Contract**, reasonable delays in the review or issuance of change orders or field orders and/or in shop drawing reviews or approvals.

11.6 Required Content of Submission of Statement of Delay Damages

11.6.1 In the verified written statement of delay damages required by Article 11.1.2, the following information shall be provided by the **Contractor**:

11.6.1.1 For each delay, the start and end dates of the claimed periods of delay and, in addition, a description of the operations that were delayed, an explanation of how they were delayed, and the reasons for the delay, including identifying the applicable act or omission of the City listed in Article 11.4.

11.6.1.2 A detailed factual statement of the claim providing all necessary dates, locations and items of **Work** affected by the claim.

11.6.1.3 The estimated amount of additional compensation sought and a breakdown of that amount into categories as described in Article 11.7.

11.6.1.4 Any additional information requested by the **Commissioner**.

11.7 Recoverable Costs

11.7.1 Delay damages may be recoverable for the following costs actually and necessarily incurred in the performance of the **Work**:

11.7.1.1 Direct labor, including payroll taxes (subject to statutory wage caps) and supplemental benefits, based on time and materials records;

11.7.1.2 Necessary materials (including transportation to the **Site**), based on time and material records;

11.7.1.3 Reasonable rental value of necessary plant and equipment other than small tools, plus fuel/energy costs according to the applicable formula set forth in Articles 26.2.4 and/or 26.2.8, based on time and material records;

11.7.1.4 Additional insurance and bond costs;

11.7.1.5 Extended **Site** overhead, field office rental, salaries of field office staff, on-site project managers and superintendents, field office staff vehicles, **Project-**specific storage, field office utilities and telephone, and field office consumables;

11.7.1.6 Labor escalation costs based on actual costs;

11.7.1.7 Materials and equipment escalation costs based on applicable industry indices unless documentation of actual increased cost is provided;

11.7.1.8 Additional material and equipment storage costs based on actual documented costs and additional costs necessitated by extended manufacturer warranty periods; and

11.7.1.9 Extended home office overhead calculated based on the following formula:

(1) Subtract from the original **Contract** amount the amount earned by original contractual **Substantial Completion** date (not

including change orders);
(2) Remove 15% overhead and profit from the calculation in item (1) by dividing the results of item (1) by 1.15;
(3) Multiply the result of item (2) by 7.25% for the total home office overhead;
(4) Multiply the result of item (3) by 7.25% for the total profit; and
(5) The total extended home office overhead will be the total of items (3) and (4).

11.7.2 Recoverable Subcontractor Costs. When the **Work** is performed by a **Subcontractor**, the **Contractor** may be paid the actual and necessary costs of such subcontracted **Work** as outlined above in Articles 11.7.1.1 through 11.7.1.8, and an additional overhead of 5% of the costs outlined in Articles 11.7.1.1 through 11.7.1.3.

11.7.3 Non-Recoverable Costs. The parties agree that the **City** will have no liability for the following items and the **Contractor** agrees it shall make no claim for the following items:

11.7.3.1 Profit, or loss of anticipated or unanticipated profit, except as provided in Article 11.7.1.9;
11.7.3.2 Consequential damages, including, but not limited to, construction or bridge loans or interest paid on such loans, loss of bonding capacity, bidding opportunities, or interest in investment, or any resulting insolvency;
11.7.3.3 Indirect costs or expenses of any nature except those included in Article 11.7.1;
11.7.3.4 Direct or indirect costs attributable to performance of **Work** where the **Contractor**, because of situations or conditions within its control, hasnot progressed the **Work** in a satisfactory manner; and
11.7.3.5 Attorneys' fees and dispute and claims preparation expenses.

11.8 Any claims for delay under this Article 11 are not subject to the jurisdiction of the Contract Dispute Resolution Board pursuant to the dispute resolution process set forth in Article 27.

11.9 Any compensation provided to the **Contractor** in accordance with this Article 11 will be made pursuant to a claim filed with the **Comptroller**. Nothing in this Article 11 extendsthe time for the **Contractor** to file an action with respect to a claim within six months after **Substantial Completion** pursuant to Article 56.

ARTICLE 12. COORDINATION WITH OTHER CONTRACTORS

12.1 During the progress of the **Work**, **Other Contractors** may be engaged in performing other work or may be awarded other contracts for additional work on this **Project**. In that event, the **Contractor** shall coordinate the **Work** to be done hereunder with the work of such **Other Contractors** and the **Contractor** shall fully cooperate with such **Other Contractors** and carefully fit its own **Work** to that provided under other contracts as may be directed by the **Engineer**. The **Contractor** shall not commit or permit any act which will interfere with the performance of work by any **Other Contractors**.

12.2 If the **Engineer** determines that the **Contractor** is failing to coordinate its **Work** with the work of **Other Contractors** as the **Engineer** has directed, then the **Commissioner** shall have the right to withhold any payments otherwise due hereunder until the **Contractor** completely complies with the **Engineer's** directions.

12.3 The **Contractor** shall notify the **Engineer** in writing if any **Other Contractor** on this **Project** is failing to coordinate its work with the **Work** of this **Contract**. If the **Engineer** finds such charges to be true, the **Engineer** shall promptly issue such directions to the **Other Contractor** with respect thereto as the situation may require. The **City** shall not, however, be liable for any damages suffered by any **Other Contractor's** failure to coordinate its work with the **Work** of this **Contract** or by reason of the **Other Contractor's** failure to promptly comply with the directions so issued by the **Engineer**, or by reason of any **Other Contractor's** default in performance, it being understood that the **City** does not guarantee the responsibility or continued efficiency of any contractor. The **Contractor** agrees to make no claim against the **City** for any damages relating to or arising out of any directions issued by the **Engineer** pursuant to this Article 12 (including but not limited to the failure of any **Other Contractor** to comply or promptly comply with such directions), or the failure of any **Other Contractor** to coordinate its work, or the default in performance of any **Other Contractor**.

12.4 The **Contractor** shall indemnify and hold the **City** harmless from any and all claims or judgments for damages and from costs and expenses to which the **City** may be subjected or which it may suffer or incur by reason of the **Contractor's** failure to comply with the **Engineer's** directions promptly; and the **Comptroller** shall have the right to exercise the powers reserved in Article 23 with respect to any claims which may be made for damages due to the **Contractor's** failure to comply with the **Engineer's** directions promptly. Insofar as the facts and **Law** relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent provided by **Law**.

12.5 Should the **Contractor** sustain any damage through any act or omission of any **Other Contractor** having a contract with the **City** for the performance of work upon the **Site** or of work which may be necessary to be performed for the proper prosecution of the **Work** to be performed hereunder, or through any act or omission of a subcontractor of such **Other Contractor**, the **Contractor** shall have no claim against the **City** for such damage, but shall have a right to recover such damage from the **Other**

12.5 **Contractor** under the provision similar to the following provisions which apply to this Contract and have been or will be inserted in the contracts with such Other Contractors:

> 12.5.1 Should any **Other Contractor** having or who shall hereafter have a contract with the **City** for the performance of work upon the **Site** sustain any damage through any act or omission of the **Contractor** hereunder or through any act or omission of any **Subcontractor** of the **Contractor**, the **Contractor** agrees to reimburse such **Other Contractor** for all such damages and to defend at its own expense any action based upon such claim and if any judgment or claim (even if the allegations of the action are without merit) against the **City** shall be allowed the **Contractor** shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith and agrees to indemnify and hold the **City** harmless from all such claims. Insofar as the facts and **Law** relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent provided by **Law**.

12.6 The **City's** right to indemnification hereunder shall in no way be diminished, waived or discharged by its recourse to assessment of liquidated damages as provided in Article 15, or by the exercise of any other remedy provided for by **Contract** or by **Law**.

ARTICLE 13. EXTENSION OF TIME FOR PERFORMANCE

13.1 If performance by the **Contractor** is delayed for a reason set forth in Article 13.3, the **Contractor** may be allowed a reasonable extension of time in conformance with this Article 13 and the **PPB**

Rules.

13.2 Any extension of time may be granted only by the **ACCO** or by the Board for the Extension of Time (hereafter "Board") (as set forth below) upon written application by the **Contractor**.

13.3 Grounds for Extension: If such application is made, the **Contractor** shall be entitled to an extension of time for delay in completion of the **Work** caused solely:

13.3.1 By the acts or omissions of the **City**, its officials, agents or employees; or

13.3.2 By the act or omissions of **Other Contractors** on this **Project**; or

13.3.3 By supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, acts of God or the public enemy, excessive inclement weather, war or other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes not brought about by any act or omission of the **Contractor**).

13.3.4 The **Contractor** shall, however, be entitled to an extension of time for such causes only for the number of **Days** of delay which the **ACCO** or the Board may determine to be due solely to such causes, and then only if the **Contractor** shall have strictly complied with all of the requirements of Articles 9 and 10.

13.4 The **Contractor** shall not be entitled to receive a separate extension of time for each of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the **Work** as determined by the **ACCO** or the Board, irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the **Contractor** or of its **Subcontractors** or **Materialmen**, and would of itself (irrespective of the concurrent causes) have delayed the **Work**, no extension of time will be allowed for the period ofdelay resulting from such act, fault or omission.

13.5 The determination made by the **ACCO** or the Board on an application for an extension of time shall be binding and conclusive on the **Contractor**.

13.6 The **ACCO** or the Board acting entirely within their discretion may grant an application for an extension of time for causes of delay other than those herein referred.

13.7 Permitting the **Contractor** to continue with the **Work** after the time fixed for its completion has expired, or after the time to which such completion may have been extended has expired, or the making of any payment to the **Contractor** after such time, shall in no way operate as a waiver on the part of the **City** of any of its rights under this **Contract**.

13.8 Application for Extension of Time:

13.8.1 Before the **Contractor's** time extension request will be considered, the **Contractor** shall notify the **ACCO** of the condition which allegedly has caused or is causing the delay, and shall submit a written application to the **ACCO** identifying:

13.8.1(a) The **Contractor**; the registration number; and **Project** description;

13.8.1(b) Liquidated damage assessment rate, as specified in the **Contract**;

13.8.1(c) Original total bid price;

13.8.1(d) The original **Contract** start date and completion date;

13.8.1(e) Any previous time extensions granted (number and duration); and

13.8.1(f) The extension of time requested.

13.8.2 In addition, the application for extension of time shall set forth in detail:

13.8.2(a) The nature of each alleged cause of delay in completing the **Work**;

13.8.2(b) The date upon which each such cause of delay began and ended and the number of **Days** attributable to each such cause;

13.8.2(c) A statement that the **Contractor** waives all claims except for those delineated in the application, and the particulars of any claims which the **Contractor** does not agree to waive. For time extensions for **Substantial Completion** and final completion payments, the application shall include a detailed statement of the dollar amounts of each element of claim item reserved; and

13.8.2(d) A statement indicating the **Contractor's** understanding that the time extension is granted only for purposes of permitting continuation of **Contract** performance and payment for **Work** performed and that the **City** retains its right to conduct an investigation and assess liquidated damages as appropriate in the future.

13.9 Analysis and Approval of Time Extensions:

13.9.1 For time extensions for partial payments, a written determination shall be made by the **ACCO** who may, for good and sufficient cause, extend the time for the performance of the **Contract** as follows:

13.9.1(a) If the **Work** is to be completed within six (6) months, the time for performance may be extended for sixty (60) **Days**;

13.9.1(b) If the **Work** is to be completed within less than one (1) year but more than six (6) months, an extension of ninety (90) **Days** may be granted;

13.9.1(c) If the **Contract** period exceeds one (1) year, besides the extension granted in Article 13.9.1(b), an additional thirty (30) **Days** may be granted for each multipleof six (6) months involved beyond the one (1) year period; or

13.9.1(d) If exceptional circumstances exist, the **ACCO** may extend the time for performance beyond the extensions in Articles 13.9.1(a), 13.9.1(b), and 13.9.1(c). In that event, the **ACCO** shall file with the Mayor's Office of Contract Services a written explanation of the exceptional circumstances.

13.9.2 For extensions of time for **Substantial Completion** and final completion payments, the **Engineer**, in consultation with the **ACCO**, shall prepare a written analysis of the delay (including a preliminary determination of the causes of delay, the beginning and end dates for each such cause of delay, and whether the delays are excusable under the terms of this **Contract**). The report shall be subject to review by and approval of the Board, which shall have authority to question its analysis and determinations and request additional facts or documentation. The report as reviewed and made final by the Board shall be made a part of the **Agency** contract file. Neither the report itself nor anything contained therein shall operate as a

waiver or release of any claim the **City** may have against the **Contractor** for either actual or liquidated damages.

13.9.3 Approval Mechanism for Time Extensions for **Substantial Completion** or Final Completion Payments: An extension shall be granted only with the approval of the Board which is comprised of the **ACCO** of the **Agency**, the **City** Corporation Counsel, and the **Comptroller**, or their authorized representatives.

13.9.4 Neither the granting of any application for an extension of time to the **Contractor** or any **Other Contractor** on this **Project** nor the papers, records or reports related to any application for or grant of an extension of time or determination related thereto shall be referred to or offered in evidence by the **Contractor** or its attorneys in any action or proceeding.

13.10 No Damage for Delay: The **Contractor** agrees to make no claim for damages for delay in the performance of this **Contract** occasioned by any act or omission to act of the **City** or any of its representatives, except as provided for in Article 11.

ARTICLE 14. COMPLETION AND FINAL ACCEPTANCE OF THE WORK

14.1 Date for **Substantial Completion**: The **Contractor** shall substantially complete the **Work** within the time fixed in Schedule A of the General Conditions, or within the time to which such **Substantial Completion** may be extended.

14.2 Determining the Date of **Substantial Completion**: The **Work** will be deemed to be substantially complete when the two conditions set forth below have been met.

14.2.1 Inspection: The **Engineer** or **Resident Engineer**, as applicable, has inspected the **Work** and has made a written determination that it is substantially complete.

14.2.2 Approval of **Final Approved Punch List** and Date for **Final Acceptance**: Following inspection of the **Work**, the **Engineer/Resident Engineer** shall furnish the **Contractor** with a final punch list, specifying all items of **Work** to be completed and proposing dates for the completion of each specified item of **Work**. The **Contractor** shall then submit in writing to the **Engineer/Resident Engineer** within ten (10) **Days** of the **Engineer/Resident Engineer** furnishing the final punch list either acceptance of the dates or proposed alternative dates for the completion of each specified item of **Work**. If the **Contractor** neither accepts the dates nor proposes alternative dates within ten (10) **Days**, the schedule proposed by the **Engineer/Resident Engineer** shall be deemed accepted. If the **Contractor** proposes alternative dates, then, within a reasonable time after receipt, the **Engineer/Resident Engineer**, in a written notification to the **Contractor**, shall approve the **Contractor's** completion dates or, if they are unable to agree, the **Engineer/Resident Engineer** shall establish dates for the completion of each item of **Work**. The latest completion date specified shall be the date for **Final Acceptance** of the **Work**.

14.3 Date of **Substantial Completion**. The date of approval of the **Final Approved Punch List**, shall be the date of **Substantial Completion**. The date of approval of the **Final Approved Punch List** shall be either (a) if the **Contractor** approves the final punch list and proposed dates for completion furnished by the **Engineer/Resident Engineer**, the date of the **Contractor**'s approval; or (b) if the **Contractor** neither accepts the dates nor proposes alternative dates, ten (10) **Days** after the **Engineer/Resident Engineer** furnishes the **Contractor** with a final punch list and proposed dates for completion; or (c) if the **Contractor** proposes alternative dates, the date that the **Engineer/Resident Engineer** sends written notification to the

Contractor either approving the **Contractor**'s proposed alternative dates or establishing dates for the completion for each item of **Work**.

14.4 Determining the Date of **Final Acceptance**: The **Work** will be accepted as final and complete as of the date of the **Engineer**'s/**Resident Engineer**'s inspection if, upon such inspection, the **Engineer/Resident Engineer** finds that all items on the **Final Approved Punch List** are complete andno further **Work** remains to be done. The **Commissioner** will then issue a written determination of **Final Acceptance**.

14.5 Request for Inspection: Inspection of the **Work** by the **Engineer/Resident Engineer** for the purpose of **Substantial Completion** or **Final Acceptance** shall be made within fourteen (14) **Days** after receipt of the **Contractor's** written request therefor.

14.6 Request for Re-inspection: If upon inspection for the purpose of **Substantial Completion** or **Final Acceptance**, the **Engineer/Resident Engineer** determines that there are items of **Work** still to be performed, the **Contractor** shall promptly perform them and then request a re-inspection. If upon re-inspection, the **Engineer/Resident Engineer** determines that the **Work** is substantially complete or finally accepted, the date of such re-inspection shall be the date of **Substantial Completion** or **Final Acceptance**. Re-inspection by the **Engineer/Resident Engineer** shall be made within ten (10) **Days** after receipt of the **Contractor's** written request therefor.

14.7 Initiation of Inspection by the **Engineer/Resident Engineer**: If the **Contractor** does not request inspection or re-inspection of the **Work** for the purpose of **Substantial Completion** or **Final Acceptance**, the **Engineer/Resident Engineer** may initiate such inspection or re-inspection.

ARTICLE 15. LIQUIDATED DAMAGES

15.1 In the event the **Contractor** fails to substantially complete the **Work** within the time fixed for such **Substantial Completion** in Schedule A of the General Conditions, plus authorized time extensions, or if the **Contractor**, in the sole determination of the **Commissioner**, has abandoned the **Work**, the **Contractor** shall pay to the **City** the sum fixed in Schedule A of the General Conditions, for each and every **Day** that the time consumed in substantially completing the **Work** exceeds the time allowed therefor; which said sum, in view of the difficulty of accurately ascertaining the loss which the **City** will suffer by reason of delay in the **Substantial Completion** of the **Work** hereunder, is hereby fixed and agreed as the liquidated damages that the **City** will suffer by reason of such delay, and not as a penalty. This Article 15 shall also apply to the **Contractor** whether or not the **Contractor** is defaulted pursuant to Chapter X of this **Contract**. Neither the failure to assess liquidated damages nor the granting of any time extension shall operate as a waiver or release of any claim the **City** may have against the **Contractor** for either actual or liquidated damages.

15.2 Liquidated damages received hereunder are not intended to be nor shall they be treated as either a partial or full waiver or discharge of the **City's** right to indemnification, or the **Contractor's** obligation to indemnify the **City**, or to any other remedy provided for in this **Contract** or by **Law**.

15.3 The **Commissioner** may deduct and retain out of the monies which may become due hereunder, the amount of any such liquidated damages; and in case the amount which may become due hereunder shall be less than the amount of liquidated damages suffered by the **City**, the **Contractor** shall be liable to pay the difference.

ARTICLE 16. OCCUPATION OR USE PRIOR TO COMPLETION

16.1 Unless otherwise provided for in the **Specifications**, the **Commissioner** may take over, use, occupy or operate any part of the **Work** at any time prior to **Final Acceptance**, upon written notification to the **Contractor**. The **Engineer** or **Resident Engineer**, as applicable, shall inspect the part of the**Work** to be taken over, used, occupied, or operated, and will furnish the **Contractor** with a written statement of the **Work**, if any, which remains to be performed on such part. The **Contractor** shall not object to, nor interfere with, the **Commissioner's** decision to exercise the rights granted by Article 16. In the event the **Commissioner** takes over, uses, occupies, or operates any part of the **Work:**

16.1.1 the **Engineer/Resident Engineer** shall issue a written determination of **Substantial Completion** with respect to such part of the **Work**;

16.1.2 the **Contractor** shall be relieved of its absolute obligation to protect such part of the unfinished **Work** in accordance with Article 7;

16.1.3 the **Contractor's** guarantee on such part of the **Work** shall begin on the date of such use by the **City**; and;

16.1.4 the **Contractor** shall be entitled to a return of so much of the amount retained in accordance with Article 21 as it relates to such part of the **Work**, except so much thereof as may be retained under Articles 24 and 44.

CHAPTER IV: SUBCONTRACTS AND ASSIGNMENTS

ARTICLE 17. SUBCONTRACTS

17.1 The **Contractor** shall not make subcontracts totaling an amount more than the percentage of the total **Contract** price fixed in Schedule A of the General Conditions, without prior written permission from the **Commissioner**. All subcontracts made by the **Contractor** shall be in writing. No **Work** may be performed by a **Subcontractor** prior to the **Contractor** entering into a written subcontract with the **Subcontractor** and complying with the provisions of this Article 17.

17.2 Before making any subcontracts, the **Contractor** shall submit a written statement to the **Commissioner** giving the name and address of the proposed **Subcontractor**; the portion of the **Work** and materials which it is to perform and furnish; the cost of the subcontract; the VENDEX questionnaire if required; the proposed subcontract if requested by the **Commissioner**; and any other information tending to prove that the proposed **Subcontractor** has the necessary facilities, skill, integrity, past experience, and financial resources to perform the **Work** in accordance with the terms and conditions of this **Contract**.

17.3 In addition to the requirements in Article 17.2, **Contractor** is required to list the **Subcontractor** in the web based Subcontractor Reporting System through the City's Payee Information Portal (PIP), available at www.nyc.gov/pip.[1]For each **Subcontractor** listed, **Contractor** is required to provide the following information: maximum contract value, description of **Subcontractor's** Work, start and end date of the subcontract and identification of the **Subcontractor**'s industry. Thereafter, **Contractor** will be required to report in the system the payments made to each **Subcontractor** within 30 days of making the

[1] In order to use the new system, a PIP account will be required. Detailed instructions on creating a PIP account and using the new system are also available at www.nyc.gov/pip. Additional assistance with PIP may be obtained by emailing the Financial Information Services Agency Help Desk at pip@fisa.nyc.gov.

payment. If any of the required information changes throughout the Term of the **Contract**, **Contractor** will be required to revise the information in the system.

Failure of the **Contractor** to list a **Subcontractor** and/or to report **Subcontractor** payments in a timely fashion may result in the **Commissioner** declaring the **Contractor** in default of the **Contract** and will subject **Contractor** to liquidated damages in the amount of $100 per day for each day that the **Contractor** fails to identify a **Subcontractor** along with the required information about the **Subcontractor** and/or fails to report payments to a **Subcontractor**, beyond the time frames set forth herein or in the notice from the **City**. Article 15 shall govern the issue of liquidated damages.

17.4 If an approved **Subcontractor** elects to subcontract any portion of its subcontract, the proposed sub-subcontract shall be submitted in the same manner as directed above.

17.5 The **Commissioner** will notify the **Contractor** in writing whether the proposed **Subcontractor** is approved. If the proposed **Subcontractor** is not approved, the **Contractor** may submit another proposed **Subcontractor** unless the **Contractor** decides to do the **Work**. No **Subcontractor** shall be permitted to enter or perform any work on the **Site** unless approved.

17.6 Before entering into any subcontract hereunder, the **Contractor** shall provide the proposed **Subcontractor** with a complete copy of this document and inform the proposed **Subcontractor** fully and completely of all provisions and requirements of this **Contract** relating either directly or indirectly to the **Work** to be performed and the materials to be furnished under such subcontract, and every such **Subcontractor** shall expressly stipulate that all labor performed and materials furnished by the **Subcontractor** shall strictly comply with the requirements of this **Contract.**

17.7 Documents given to a prospective **Subcontractor** for the purpose of soliciting the **Subcontractor's** bid shall include either a copy of the bid cover or a separate information sheet setting forth the **Project** name, the **Contract** number (if available), the **Agency** (as noted in Article 2.1.6), and the **Project's** location.

17.8 The **Commissioner's** approval of a **Subcontractor** shall not relieve the **Contractor** of any of its responsibilities, duties, and liabilities hereunder. The **Contractor** shall be solely responsible to the **City** for the acts or defaults of its **Subcontractor** and of such **Subcontractor's** officers, agents, and employees, each of whom shall, for this purpose, be deemed to be the agent or employee of the **Contractor** to the extent of its subcontract.

17.9 If the **Subcontractor** fails to maintain the necessary facilities, skill, integrity, past experience, and financial resources (other than due to the **Contractor's** failure to make payments where required) to perform the **Work** in accordance with the terms and conditions of this **Contract**, the **Contractor** shall promptly notify the **Commissioner** and replace such **Subcontractor** with a newly approved **Subcontractor** in accordance with this Article 17.

17.10 The **Contractor** shall be responsible for ensuring that all **Subcontractors** performing **Work** at the **Site** maintain all insurance required by **Law**.

17.11 The **Contractor** shall promptly, upon request, file with the **Engineer** a conformed copy 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 Insuredand a Loss Payee as its interest may appear.

22.1.4(a) Policies of such insurance shall specify that, in the event a loss occurs at an occupied facility, occupancy of such facility is permitted without the consent of the issuing insurance company.

22.1.4(b) Such insurance may be provided through an Installation Floater, at the **Contractor's** option, if it otherwise conforms with the requirements of this Article 22.1.4.

22.1.5 Commercial Automobile Liability Insurance: The **Contractor** shall provide Commercial Automobile Liability Insurance for liability arising out of ownership, maintenance or use of any owned (if any), non-owned and hired vehicles to be used in connection with this **Contract**. Coverage shall be at least as broad as the latest edition of ISO Form CA0001. If vehicles are used for transporting hazardous materials, the Automobile Liability Insurance shall be endorsed to provide pollution liability broadened coverage for covered vehicles (endorsement CA 99 48) as well as proof of MCS 90.

22.1.6 Contractors Pollution Liability Insurance: If specified in Schedule A of the General Conditions, the **Contractor** shall maintain, or cause the **Subcontractor** doing such **Work**to maintain, Contractors Pollution Liability Insurance covering bodily injury and property damage. Such insurance shall provide coverage for actual, alleged or threatened emission, discharge, dispersal, seepage, release or escape of pollutants (including asbestos), including any loss, cost or expense incurred as a result of any cleanup of pollutants (including asbestos) or in the investigation, settlement or defense of any claim, action, or proceedings arising from the operations under this **Contract**. Such insurance shall be in the **Contractor's** name and list the **City** as an Additional Insured and any other entity specified in Schedule A. Coverage shall include, without limitation, (a) loss of use of damaged property or of property that has not been physically injured, (b) transportation, and (c) non- owned disposal sites.

22.1.6(a) Coverage for the **City** as Additional Insured shall specifically include the **City's** officials and employees and be at least as broad as provided to the **Contractor** for this **Project**.

22.1.6(b) If such insurance is written on a claims-made policy, such policy shall have a retroactive date on or before the effective date of this **Contract**, and continuous coverage shall be maintained, or an extended discovery period exercised, for a period of not less than three (3) years from the time the **Work** under this **Contract** is completed.

22.1.7 Marine Insurance:

22.1.7(a) Marine Protection and Indemnity Insurance: If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the**Subcontractor** doing such Work to maintain, Marine Protection and Indemnity Insurance with coverage at least as broad as Form SP-23. The insurance shall provide coverage for the **Contractor** or **Subcontractor** (whichever is doing this **Work**) and for the **City** (together with its officials and employees) and any other entity specified in Schedule A as an Additional Insured for bodily injury and property damage arising from marine operations under this

Contract. Coverage shall include, without limitation, injury or death of crew members (if not fully provided through other insurance), removal of wreck, damage to piers, wharves and other fixed or floating objects and loss of or damage to any other vessel or craft, or to property on such other vessel or craft.

22.1.7(b) Hull and Machinery Insurance: If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the **Subcontractor** doing such **Work** to maintain, Hull and Machinery Insurance with coverage for the **Contractor** or **Subcontractor** (whichever is doing this Work) and for the **City** (together with its officials and employees) as Additional Insured at least as broad as the latest edition of American Institute Tug Form for all tugs used under this **Contract** and Collision Liability at least as broad as the latest edition of American Institute Hull Clauses.

22.1.7(c) Marine Pollution Liability Insurance: If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the **Subcontractor** doing such Work to maintain, Marine Pollution Liability Insurance covering itself (or the Subcontractor doing such Work) as Named Insured and the **City** (together with its officials and employees) and any other entity specified in Schedule A as an Additional Insured. Coverage shall be at least as broad as that provided by the latest edition of Water Quality Insurance Syndicate Form and include, without limitation, liability arising from the discharge or substantial threat of a discharge of oil, or from the release or threatened release of a hazardous substance including injury to, or economic losses resulting from, the destruction of or damage to real property, personal property or natural resources.

22.1.8 The **Contractor** shall provide such other types of insurance, at such minimum limits and with such conditions, as are specified in Schedule A of the General Conditions.

22.2 General Requirements for Insurance Coverage and Policies:

22.2.1 All required insurance policies shall be maintained with companies that may lawfully issue the required policy and have an A.M. Best rating of at least A-/VII or a Standard and Poor's rating of at least A, unless prior written approval is obtained from the **City** Corporation Counsel.

22.2.2 The **Contractor** shall be solely responsible for the payment of all premiums for all required policies and all deductibles and self-insured retentions to which such policies are subject, whether or not the **City** is an insured under the policy.

22.2.3 In his/her sole discretion, the **Commissioner** may, subject to the approval of the **Comptroller** and the **City** Corporation Counsel, accept Letters of Credit and/or custodial accounts in lieu of required insurance.

22.2.4 The **City's** limits of coverage for all types of insurance required pursuant to Schedule A of the General Conditions shall be the greater of (i) the minimum limits set forth in Schedule A or (ii) the limits provided to the **Contractor** as Named Insured under all primary, excess, and umbrella policies of that type of coverage.

22.2.5 The **Contractor** may satisfy its insurance obligations under this Article 22 through primary policies or a combination of primary and excess/umbrella policies, so long as all policies provide the scope of coverage required herein.

22.2.6 Policies of insurance provided pursuant to this Article 22 shall be primary and non-contributing to any insurance or self-insurance maintained by the **City**.

22.3 Proof of Insurance:

22.3.1 For all types of insurance required by Article 22.1 and Schedule A, except for insurance required by Articles 22.1.4 and 22.1.7, the **Contractor** shall file proof of insurance in accordance with this Article 22.3 within ten (10) **Days** of award. For insurance provided pursuant to Articles 22.1.4 and 22.1.7, proof shall be filed by a date specified by the **Commissioner** or ten (10) **Days** prior to the commencement of the portion of the **Work** covered by such policy, whichever is earlier.

22.3.2 For Workers' Compensation Insurance provided pursuant to Article 22.1.2, the **Contractor** shall submit one of the following forms: C-105.2 Certificate of Workers' Compensation Insurance; U-26.3 - State Insurance Fund Certificate of Workers' Compensation Insurance; Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the **Commissioner**. For Disability Benefits Insurance provided pursuant to Article 22.1.2, the Contractor shall submit DB-120.1 - Certificate Of Insurance Coverage Under The NYS Disability Benefits Law, Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the **Commissioner**. ACORD forms are not acceptable.

22.3.3 For policies provided pursuant to all of Article 22.1 other than Article 22.1.2, the **Contractor** shall submit one or more Certificates of Insurance on forms acceptable to the **Commissioner**. All such Certificates of Insurance shall certify (a) the issuance and effectiveness of such policies of insurance, each with the specified minimum limits (b) for insurance secured pursuant to Article 22.1.1 that the **City** and any other entity specified in Schedule A is an Additional Insured thereunder; (c) in the event insurance is required pursuant to Article 22.1.6 and/or Article 22.1.7, that the City is an Additional Insured thereunder; (d) the company code issued to the insurance company by the National Association of Insurance Commissioners (the NAIC number); and (e) the number assigned to the **Contract** by the **City**. All such Certificates of Insurance shall be accompanied by either a duly executed "Certification by Insurance Broker or Agent" in the form contained in Part III of Schedule A or copies of all policies referenced in such Certificate of Insurance as certified by an authorized representative of the issuing insurance carrier. If any policy is not available at the time of submission, certified binders may be submitted until such time as the policy is available, at which time a certified copy of the policy shall be submitted.

22.3.4 Documentation confirming renewals of insurance shall be submitted to the **Commissioner** prior to the expiration date of coverage of policies required under this **Contract**. Such proofs of insurance shall comply with the requirements of Articles 22.3.2 and 22.3.3.

22.3.5 The **Contractor** shall be obligated to provide the **City** with a copy of any policy of insurance provided pursuant to this Article 22 upon the demand for such policy by the **Commissioner** or the **City** Corporation Counsel.

22.4 Operations of the **Contractor**:

22.4.1 The **Contractor** shall not commence the **Work** unless and until all required certificates have been submitted to and accepted by the **Commissioner**. Acceptance by the

Commissioner of a certificate does not excuse the **Contractor** from securing insurance consistent with all provisions of this Article 22 or of any liability arising from its failure todo so.

22.4.2 The **Contractor** shall be responsible for providing continuous insurance coverage in the manner, form, and limits required by this **Contract** and shall be authorized to perform **Work** only during the effective period of all required coverage.

22.4.3 In the event that any of the required insurance policies lapse, are revoked, suspended or otherwise terminated, for whatever cause, the **Contractor** shall immediately stop all **Work**, and shall not recommence **Work** until authorized in writing to do so by the **Commissioner**. Upon quitting the **Site**, except as otherwise directed by the **Commissioner**, the **Contractor** shall leave all plant, materials, equipment, tools, and supplies on the **Site**. **Contract** time shall continue to run during such periods and no extensions of time will be granted. The **Commissioner** may also declare the **Contractor** in default for failure to maintain required insurance.

22.4.4 In the event the **Contractor** receives notice, from an insurance company or other person, that any insurance policy required under this Article 22 shall be cancelled or terminated (or has been cancelled or terminated) for any reason, the **Contractor** shall immediately forward a copy of such notice to both the **Commissioner** and the New York City Comptroller, attn: Office of Contract Administration, Municipal Building, One Centre Street, room 1005, New York, New York 10007. Notwithstanding the foregoing, the **Contractor** shall ensure that there is no interruption in any of the insurance coverage required under this Article 22.

22.4.5 Where notice of loss, damage, occurrence, accident, claim or suit is required under an insurance policy maintained in accordance with this Article 22, the **Contractor** shall notify in writing all insurance carriers that issued potentially responsive policies of any such event relating to any operations under this **Contract** (including notice to Commercial General Liability insurance carriers for events relating to the **Contractor**'s own employees) no later than 20 days after such event. For any policy where the **City** is an Additional Insured, such notice shall expressly specify that "this notice is being given on behalf of the City of New York as Insured as well as the Named Insured." Such notice shall also contain the following information: the number of the insurance policy, the name of the named insured, the date and location of the damage, occurrence, or accident, and the identity of the persons or things injured, damaged or lost. The **Contractor** shall simultaneously send a copy of such notice to the City of New York c/o Insurance Claims Specialist, Affirmative Litigation Division, New York City Law Department, 100 Church Street, New York, New York 10007.

22.4.6 In the event of any loss, accident, claim, action, or other event that does or can give rise to a claim under any insurance policy required under this Article 22, the **Contractor** shall at all times fully cooperate with the **City** with regard to such potential or actual claim.

22.5 **Subcontractor** Insurance: In the event the **Contractor** requires any **Subcontractor** to procure insurance with regard to any operations under this **Contract** and requires such **Subcontractor** to name the **Contractor** as an **Additional Insured** thereunder, the **Contractor** shall ensure that the **Subcontractor** name the **City**, including its officials and employees, as an Additional Insured with coverage at least as broad as the most recent edition of ISO Form CG 20 26.

22.6 Wherever reference is made in Article 7 or this Article 22 to documents to be sent to the **Commissioner** (e.g., notices, filings, or submissions), such documents shall be sent to the address set forth in Schedule A of the General Conditions. In the event no address is set forth in Schedule A, such documents

are to be sent to the **Commissioner's** address as provided elsewhere in this **Contract**.

22.7 Apart from damages or losses covered by insurance provided pursuant to Articles 22.1.2, 22.1.3, or 22.1.5, the **Contractor** waives all rights against the **City**, including its officials and employees, for any damages or losses that are covered under any insurance required under this Article 22 (whether or not such insurance is actually procured or claims are paid thereunder) or any other insurance applicableto the operations of the **Contractor** and/or its employees, agents, or **Subcontractors**.

22.8 In the event the **Contractor** utilizes a self-insurance program to satisfy any of the requirements of this Article 22, the **Contractor** shall ensure that any such self-insurance program provides the **City** with all rights that would be provided by traditional insurance under this Article 22, including but not limited to the defense and indemnification obligations that insurers are required to undertake in liability policies.

22.9 Materiality/Non-Waiver: The **Contractor's** failure to secure policies in complete conformity with this Article 22, or to give an insurance company timely notice of any sort required in this **Contract** or to do anything else required by this Article 22 shall constitute a material breach of this **Contract**. Such breach shall not be waived or otherwise excused by any action or inaction by the **City** at any time.

22.10 Pursuant to General Municipal Law Section 108, this **Contract** shall be void and of no effect unless **Contractor** maintains Workers' Compensation Insurance for the term of this **Contract** tothe extent required and in compliance with the New York State Workers' Compensation Law.

22.11 Other Remedies: Insurance coverage provided pursuant to this Article 22 or otherwise shall not relieve the **Contractor** of any liability under this **Contract**, nor shall it preclude the **City** from exercising any rights or taking such other actions available to it under any other provisions of this **Contract** or **Law**.

ARTICLE 23. MONEY RETAINED AGAINST CLAIMS

23.1 If any claim shall be made by any person or entity (including **Other Contractors** with the **City** on this **Project**) against the **City** or against the **Contractor** and the **City** for any of the following:

(a) An alleged loss, damage, injury, theft or vandalism of any of the kinds referred to in Articles 7 and 12, plus the reasonable costs of defending the **City**, which in the opinion of the **Comptroller** may not be paid by an insurance company (for any reason whatsoever);or

(b) An infringement of copyrights, patents or use of patented articles, tools, etc., asreferred to in Article 57; or

(c) Damage claimed to have been caused directly or indirectly by the failure of the **Contractor** to perform the **Work** in strict accordance with this **Contract,**

the amount of such claim, or so much thereof as the **Comptroller** may deem necessary, may be withheld by the **Comptroller**, as security against such claim, from any money due hereunder. The **Comptroller**, in his/her discretion, may permit the **Contractor** to substitute other satisfactory security in lieu of the monies so withheld.

23.2 If an action on such claim is timely commenced and the liability of the **City**, or the **Contractor**,

or both, shall have been established therein by a final judgment of a court of competent jurisdiction, or if such claim shall have been admitted by the **Contractor** to be valid, the **Comptroller** shall pay such judgment or admitted claim out of the monies retained by the **Comptroller** under the provisions of this Article 23, and return the balance, if any, without interest, to the **Contractor**.

ARTICLE 24. MAINTENANCE AND GUARANTY

24.1 The **Contractor** shall promptly repair, replace, restore or rebuild, as the **Commissioner** may determine, any finished **Work** in which defects of materials or workmanship may appear or to which damage may occur because of such defects, during the one (1) year period subsequent to the date of **Substantial Completion** (or use and occupancy in accordance with Article 16), except where other periods of maintenance and guaranty are provided for in Schedule A.

24.2 As security for the faithful performance of its obligations hereunder, the **Contractor**, upon filing its requisition for payment on **Substantial Completion**, shall deposit with the **Commissioner** a sum equal to one (1%) percent of the price (or the amount fixed in Schedule A of the General Conditions) in cash or certified check upon a state or national bank and trust company or a check of such bank and trust company signed by a duly authorized officer thereof and drawn to the order of the **Comptroller**, or obligations of the **City**, which the **Comptroller** may approve as of equal value with the sum so required.

24.3 In lieu of the above, the **Contractor** may make such security payment to the **City** byauthorizing the **Commissioner** in writing to deduct the amount from the **Substantial Completion** payment which shall be deemed the deposit required above.

24.4 If the **Contractor** has faithfully performed all of its obligations hereunder the **Commissioner** shall so certify to the **Comptroller** within five (5) **Days** after the expiration of one (1) year from the date of **Substantial Completion** and acceptance of the **Work** or within thirty (30) **Days** after the expirationof the guarantee period fixed in the **Specifications**. The security payment shall be repaid to the **Contractor** without interest within thirty (30) **Days** after certification by the **Commissioner** to the **Comptroller** that the **Contractor** has faithfully performed all of its obligations hereunder.

24.5 Notice by the **Commissioner** to the **Contractor** to repair, replace, rebuild or restore such defective or damaged **Work** shall be timely, pursuant to this article, if given not later than ten (10) **Days** subsequent to the expiration of the one (1) year period or other periods provided for herein.

24.6 If the **Contractor** shall fail to repair, replace, rebuild or restore such defective or damaged **Work** promptly after receiving such notice, the **Commissioner** shall have the right to have the **Work** done by others in the same manner as provided for in the completion of a defaulted **Contract**, under Article 51.

24.7 If the security payment so deposited is insufficient to cover the cost of such **Work**, the **Contractor** shall be liable to pay such deficiency on demand by the **Commissioner**.

24.8 The **Engineer's** certificate setting forth the fair and reasonable cost of repairing, replacing, rebuilding or restoring any damaged or defective **Work** when performed by one other than the **Contractor**, shall be binding and conclusive upon the **Contractor** as to the amount thereof.

24.9 The **Contractor** shall obtain all manufacturers' warranties and guaranties of all equipment and materials required by this **Contract** in the name of the **City** and shall deliver same to the **Commissioner**. All of the **City's** rights and title and interest in and to said manufacturers' warranties and guaranties may be assigned by the **City** to any subsequent purchasers of such equipment and materials or lessees of the

premises into which the equipment and materials have been installed.

CHAPTER VI: CHANGES, EXTRA WORK, AND DOCUMENTATION OF CLAIM

ARTICLE 25. CHANGES

25.1 Changes may be made to this **Contract** only as duly authorized in writing by the **Commissioner** in accordance with the **Law** and this **Contract**. All such changes, modifications, and amendments will become a part of the **Contract**. **Work** so ordered shall be performed by the **Contractor**.

25.2 **Contract** changes will be made only for **Work** necessary to complete the **Work** included inthe original scope of the **Contract** and/or for non-material changes to the scope of the **Contract**. Changes are not permitted for any material alteration in the scope of **Work** in the **Contract**.

25.3 The **Contractor** shall be entitled to a price adjustment for **Extra Work** performed pursuant toa written change order. Adjustments to price shall be computed in one or more of the following ways:

25.3.1 By applicable unit prices specified in the **Contract**; and/or

25.3.2 By agreement of a fixed price; and/or

25.3.3 By time and material records; and/or

25.3.4 In any other manner approved by the **CCPO**.

25.4 All payments for change orders are subject to pre-audit by the **Engineering Audit Officer** and may be post-audited by the **Comptroller** and/or the **Agency**.

ARTICLE 26. METHODS OF PAYMENT FOR OVERRUNS AND EXTRA WORK

26.1 Overrun of Unit Price Item: An overrun is any quantity of a unit price item which the **Contractor** is directed to provide which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule.

26.1.1 For any unit price item, the **Contractor** will be paid at the unit price bid for any quantity up to one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule. If during the progress of the **Work**, the actual quantity of any unit price item required to complete the **Work** approaches the estimated quantity forthat item, and for any reason it appears that the actual quantity of any unit price item necessary to complete the **Work** will exceed the estimated quantity for that item by twenty- five (25%) percent, the **Contractor** shall immediately notify the **Engineer** of such anticipated overrun. The **Contractor** shall not be compensated for any quantity of a unit price item provided which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule without written authorization from the **Engineer**.

26.1.2 If the actual quantity of any unit price item necessary to complete the **Work** will exceed one hundred twenty five (125%) percent of the estimated quantity for that item set forth in the bid schedule, the **City** reserves the right and the **Contractor** agrees to negotiate a new unit price for such item. In no event shall such negotiated new unit price exceed the unit bid price. If the **City** and **Contractor** cannot agree on a new unit price, then the **City** shall order the **Contractor** and the **Contractor** agrees to provide additional quantities of the item on the

basis of time and material records for the actual and reasonable cost as determined under Article 26.2, but in no event at a unit price exceeding the unit price bid.

26.2 **Extra Work:** For **Extra Work** where payment is by agreement on a fixed price in accordance with Article 25.3.2, the price to be paid for such **Extra Work** shall be based on the fair and reasonable estimated cost of the items set forth below. For **Extra Work** where payment is based on time and material records in accordance with Article 25.3.3, the price to be paid for such **Extra Work** shall be the actual and reasonable cost of the items set forth below, calculated in accordance with the formula specified therein, if any.

26.2.1 Necessary materials (including transportation to the **Site**); plus

26.2.2 Necessary direct labor, including payroll taxes (subject to statutory wage caps) and supplemental benefits; plus

26.2.3 Sales and personal property taxes, if any, required to be paid on materials not incorporated into such **Extra Work**; plus

26.2.4 Reasonable rental value of **Contractor**-owned (or **Subcontractor**-owned, as applicable), necessary plant and equipment other than **Small Tools**, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per operating hour: (.035) x (HP rating) x (Fuel cost/gallon). Reasonable rental value is defined as the lower of either seventy-five percent of the monthly prorated rental rates established in "The AED Green Book, Rental Rates and Specifications for Construction Equipment" published by Equipment Watch (the "Green Book"), or seventy-five percent of the monthly prorated rental rates established in the "Rental Rate Blue Book for Construction Equipment" published by Equipment Watch (the "Blue Book") (the applicable Blue Book rate being for rental only without the addition of any operational costs listed in the Blue Book). The reasonable rental value is deemed to be inclusive of all operating costs except for fuel/energy consumption and equipment operator's wages/costs. For multiple shift utilization, reimbursement shall be calculated as follows: first shift shall be seventy-five (75%) percent of such rental rates; second shift shall be sixty (60%) percent of the first shift rate; and third shift shall be forty (40%) percent of the first shift rate. Equipment on standby shall be reimbursed at one-third (1/3) the prorated monthly rental rate. **Contractor**-owned (or **Subcontractor**-owned, as applicable) equipment includes equipment from rental companies affiliated with or controlled by the **Contractor** (or **Subcontractor**, as applicable)**,** as determined by the **Commissioner**. In establishing cost reimbursement for non-operating **Contractor**-owned (or **Subcontractor**-owned, as applicable) equipment (scaffolding, sheeting systems, road plates, etc.), the **City** may restrict reimbursement to a purchase-salvage/life cycle basis if less than the computed rental costs; plus

26.2.5 Necessary installation and dismantling of such plant and equipment, including transportation to and from the **Site**, if any, provided that, in the case of non-**Contractor**-owned (or non-**Subcontractor**-owned, as applicable) equipment rented from a third party, the cost of installation and dismantling are not allowable if such costs are included in the rental rate; plus

26.2.6 Necessary fees charged by governmental entities; plus

26.2.7 Necessary construction-related service fees charged by non-governmental entities, such as landfill tipping fees; plus

26.2.8 Reasonable rental costs of non-**Contractor**-owned (or non-**Subcontractor**-owned, as applicable) necessary plant and equipment other than **Small Tools**, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per hour of operation: (.035) x (HP rating) x (Fuel cost/gallon). In lieu of renting, the **City** reserves the right to direct the purchase of non-operating equipment (scaffolding, sheeting systems, road plates, etc.), with payment on a purchase-salvage/life cycle basis, if less than the projected rental costs; plus

26.2.9 Workers' Compensation Insurance, and any insurance coverage expressly required by the **City** for the performance of the **Extra Work** which is different than the types of insurance required by Article 22 and Schedule A of the General Conditions. The cost of Workers' Compensation Insurance is subject to applicable payroll limitation caps and shall be based upon the carrier's Manual Rate for such insurance derived from the applicable class Loss Cost ("LC") and carrier's Lost Cost Multiplier ("LCM") approved by the New York State Department of Financial Services, and with the exception of experience rating, rate modifiers as promulgated by the New York Compensation Insurance Rating Board ("NYCIRB"); plus

26.2.10 Additional costs incurred as a result of the **Extra Work** for performance and payment bonds; plus

26.2.11 Twelve percent (12%) percent of the total of items in Articles 26.2.1 through 26.2.5 as compensation for overhead, except that no percentage for overhead will be allowed on **Payroll Taxes** or on the premium portion of overtime pay or on sales and personal property taxes. Overhead shall include without limitation, all costs and expenses in connection with administration, management superintendence, small tools, and insurance required by Schedule A of the General Conditions other than Workers' Compensation Insurance; plus

26.2.12 Ten (10%) percent of the total of items in Articles 26.2.1 through 26.2.5, plus the items in Article 26.2.11, as compensation for profit, except that no percentage for profit will be allowed on **Payroll Taxes** or on the premium portion of overtime pay or on sales and personal property taxes; plus

26.2.13 Five (5%) percent of the total of items in Articles 26.2.6 through 26.2.10 as compensation for overhead and profit.

26.3 Where the **Extra Work** is performed in whole or in part by other than the **Contractor's** own forces pursuant to Article 26.2, the **Contractor** shall be paid, subject to pre-audit by the **Engineering Audit Officer**, the cost of such **Work** computed in accordance with Article 26.2 above, plus an additional allowance of five (5%) percent to cover the **Contractor's** overhead and profit.

26.4 Where a change is ordered, involving both **Extra Work** and omitted or reduced **Contract Work,** the **Contract** price shall be adjusted, subject to pre-audit by the **EAO**, in an amount based on the difference between the cost of such **Extra Work** and of the omitted or reduced **Work**.

26.5 Where the **Contractor** and the **Commissioner** can agree upon a fixed price for **Extra Work** in accordance with Article 25.3.2 or another method of payment for **Extra Work** in accordance with Article 25.3.4, or for **Extra Work** ordered in connection with omitted **Work**, such method, subject to pre-audit by the **EAO**, may, at the option of the **Commissioner**, be substituted for the cost plus a percentage method provided in Article 26.2; provided, however, that if the **Extra Work** is performed by a **Subcontractor**, the **Contractor** shall not be entitled to receive more than an additional allowance of five (5%) percent for overhead and profit over

the cost of such **Subcontractor's Work** as computed in accordance with Article 26.2.

ARTICLE 27. RESOLUTION OF DISPUTES

27.1 All disputes between the **City** and the **Contractor** of the kind delineated in this Article 27.1 that arise under, or by virtue of, this **Contract** shall be finally resolved in accordance with the provisions of this Article 27 and the **PPB** Rules. This procedure for resolving all disputes of the kind delineated herein shall be the exclusive means of resolving any such disputes.

27.1.1 This Article 27 shall not apply to disputes concerning matters dealt with in other sections of the **PPB** Rules, or to disputes involving patents, copyrights, trademarks, or trade secrets (as interpreted by the courts of New York State) relating to proprietary rights in computer software.

27.1.2 This Article 27 shall apply only to disputes about the scope of **Work** delineated by the **Contract**, the interpretation of **Contract** documents, the amount to be paid for **Extra Work** or disputed work performed in connection with the **Contract**, the conformity of the **Contractor's Work** to the **Contract**, and the acceptability and quality of the **Contractor's Work**; such disputes arise when the **Engineer**, **Resident Engineer**, **Engineering Audit Officer**, or other designee of the **Commissioner** makes a determination with which the **Contractor** disagrees.

27.2 All determinations required by this Article 27 shall be made in writing clearly stated, with a reasoned explanation for the determination based on the information and evidence presented to the party making the determination. Failure to make such determination within the time required by this Article 27 shall be deemed a non-determination without prejudice that will allow application to the next level.

27.3 During such time as any dispute is being presented, heard, and considered pursuant to this Article 27, the **Contract** terms shall remain in force and the **Contractor** shall continue to perform **Work** as directed by the **ACCO** or the **Engineer**. Failure of the **Contractor** to continue **Work** as directed shall constitute a waiver by the **Contractor** of its claim.

27.4 Presentation of Disputes to **Commissioner**.

Notice of Dispute and Agency Response. The **Contractor** shall present its dispute in writing ("Notice of Dispute") to the **Commissioner** within thirty (30) Days of receiving written notice of the determination or action that is the subject of the dispute. This notice requirement shall not be read to replace any other notice requirements contained in the **Contract**. The Notice of Dispute shall include all the facts, evidence, documents, or other basis upon which the **Contractor** relies in support of its position, as well as a detailed computation demonstrating how any amount of money claimed by the **Contractor** inthe dispute was arrived at. Within thirty (30) Days after receipt of the detailed written submission comprising the complete Notice of Dispute, the **Engineer**, **Resident Engineer**, **Engineering Audit Officer**, or other designee of the **Commissioner** shall submit to the **Commissioner** all materials he or she deems pertinent to the dispute. Following initial submissions to the **Commissioner**, either party may demand of the other the production of any document or other material the demanding party believes may be relevant to the dispute. The requested party shall produce all relevant materials that are not otherwise protected by a legal privilege recognized by the courts of New York State. Any question of relevancy shall be determined by the **Commissioner** whose decision shall be final. Willful failure of the **Contractor** to produce any requested material whose relevancy the **Contractor** has not disputed, or whose relevancy has been affirmatively determined, shall constitute a waiver by the **Contractor** of its claim.

27.4.1 **Commissioner** Inquiry. The **Commissioner** shall examine the material and may, in his or her discretion, convene an informal conference with the **Contractor**, the **ACCO**, and the **Engineer**, **Resident Engineer**, **Engineering Audit Officer**, or other designee of the **Commissioner** to resolve the issue by mutual consent prior to reaching a determination. The **Commissioner** may seek such technical or other expertise as he or she shall deem appropriate, including the use of neutral mediators, and require any such additional material from either or both parties as he or she deems fit. The **Commissioner's** ability to render, and the effect of, a decision hereunder shall not be impaired by any negotiations in connection with the dispute presented, whether or not the **Commissioner** participated therein. The **Commissioner** may or, at the request of any party to the dispute, shall compel the participation of any **Other Contractor** with a contract related to the **Work** of this **Contract**, and that **Contractor** shall be bound by the decision of the **Commissioner**. Any **Other Contractor** thus brought into the dispute resolution proceeding shall have the same rights and obligations under this Article 27 as the **Contractor** initiating the dispute.

27.4.2 **Commissioner** Determination. Within thirty (30) **Days** after the receipt of all materials and information, or such longer time as may be agreed to by the parties, the **Commissioner** shall make his or her determination and shall deliver or send a copy of such determination to the **Contractor**, the **ACCO,** and **Engineer**, **Resident Engineer**,**Engineering Audit Officer**, or other designee of the **Commissioner**, as applicable, together with a statement concerning how the decision may be appealed.

27.4.3 Finality of **Commissioner's** Decision. The **Commissioner's** decision shall be final and binding on all parties, unless presented to the Contract Dispute Resolution Board pursuant to this Article 27. The **City** may not take a petition to the Contract Dispute Resolution Board. However, should the **Contractor** take such a petition, the **City** may seek, and the Contract Dispute Resolution Board may render, a determination less favorable to the **Contractor** and more favorable to the **City** than the decision of the **Commissioner**.

27.5 Presentation of Dispute to the **Comptroller**. Before any dispute may be brought by the **Contractor** to the Contract Dispute Resolution Board, the **Contractor** must first present its claim to the **Comptroller** for his or her review, investigation, and possible adjustment.

27.5.1 Time, Form, and Content of Notice. Within thirty (30) **Days** of its receipt of a decision by the **Commissioner,** the **Contractor** shall submit to the **Comptroller** and to the **Commissioner** a Notice of Claim regarding its dispute with the **Agency**. The Notice of Claim shall consist of (i) a brief written statement of the substance of the dispute, the amount of money, if any, claimed and the reason(s) the **Contractor** contends the dispute was wrongly decided by the **Commissioner**; (ii) a copy of the written decision of the **Commissioner**; and (iii) a copy of all materials submitted by the **Contractor** to the **Agency**, including the Notice of Dispute. The **Contractor** may not present to the **Comptroller** any material not presented to the **Commissioner**, except at the request of the **Comptroller**.

27.5.2 Response. Within thirty (30) **Days** of receipt of the Notice of Claim, the **Agency** shall make available to the **Comptroller** a copy of all material submitted by the **Agency** to the **Commissioner** in connection with the dispute. The **Agency** may not present to the **Comptroller** any material not presented to the **Commissioner** except at the request of the **Comptroller**.

27.5.3 **Comptroller** Investigation. The **Comptroller** may investigate the claim in dispute and, in the course of such investigation, may exercise all powers provided in Sections 7-201 and 7-203 of the Administrative Code. In addition, the **Comptroller** may demand of either party, and such party shall provide, whatever additional material the **Comptroller** deems pertinent to the claim, including original business records of the **Contractor**. Willful failure of the **Contractor** to produce within fifteen (15) **Days** any material requested by the **Comptroller** shall constitute a waiver by the **Contractor** of its claim. The **Comptroller** may also schedule an informal conference to be attended by the **Contractor**, **Agency** representatives, and any other personnel desired by the **Comptroller**.

27.5.4 Opportunity of **Comptroller** to Compromise or Adjust Claim. The **Comptroller** shall have forty-five (45) **Days** from his or her receipt of all materials referred to in Article 27.5.3 to investigate the disputed claim. The period for investigation and compromise may be further extended by agreement between the **Contractor** and the **Comptroller**, to a maximum of ninety (90) **Days** from the **Comptroller's** receipt of all materials. The **Contractor** may not present its petition to the Contract Dispute Resolution Board until the period for investigation and compromise delineated in this Article 27.5.4 has expired. In compromising or adjusting any claim hereunder, the **Comptroller** may not revise or disregard the terms of the **Contract** between the parties.

27.6 Contract Dispute Resolution Board. There shall be a Contract Dispute Resolution Board composed of:

27.6.1 The chief administrative law judge of the Office of Administrative Trials and Hearings (OATH) or his/her designated OATH administrative law judge, who shall act as chairperson, and may adopt operational procedures and issue such orders consistent with this Article 27 as may be necessary in the execution of the Contract Dispute Resolution Board's functions, including, but not limited to, granting extensions of time to present or respond to submissions;

27.6.2 The **CCPO** or his/her designee; any designee shall have the requisite background to consider and resolve the merits of the dispute and shall not have participated personally and substantially in the particular matter that is the subject of the dispute or report to anyone who so participated; and

27.6.3 A person with appropriate expertise who is not an employee of the **City**. This person shall be selected by the presiding administrative law judge from a prequalified panel of individuals, established and administered by OATH with appropriate background to act as decision-makers in a dispute. Such individual may not have a contract or dispute with the **City** or be an officer or employee of any company or organization that does, or regularly represents persons, companies, or organizations having disputes with the **City**.

27.7 Petition to the Contract Dispute Resolution Board. In the event the claim has not been settled or adjusted by the **Comptroller** within the period provided in this Article 27, the **Contractor**, within thirty (30) **Days** thereafter, may petition the Contract Dispute Resolution Board to review the

Commissioner's determination.

27.7.1 Form and Content of Petition by **Contractor**. The **Contractor** shall present its dispute to the Contract Dispute Resolution Board in the form of a petition, which shall include (i) a brief written statement of the substance of the dispute, the amount of money, if any, claimed, and the reason(s) the **Contractor** contends the dispute was wrongly decided by the **Commissioner**; (ii) a copy of the written Decision of the **Commissioner,** (iii) copies of all materials submitted by the **Contractor** to the Agency; (iv) a copy of the written decision of the **Comptroller**, if any, and (v) copies of all correspondence with, or written material submitted by the **Contractor**, to the **Comptroller**. The **Contractor** shall concurrently submit four (4) complete sets of the Petition: one set to the **City** Corporation Counsel (Attn: Commercial and Real Estate Litigation Division) and three (3) sets to the Contract Dispute Resolution Board at OATH's offices with proof of service on the **City** Corporation Counsel. In addition, the **Contractor** shall submit a copy of the written statement of the substance of the dispute, cited in (i) above, to both the **Commissioner** and the **Comptroller**.

27.7.2 **Agency** Response. Within thirty (30) **Days** of its receipt of the Petition by the **City** Corporation Counsel, the **Agency** shall respond to the brief written statement of the **Contractor** and make available to the Contract Dispute Resolution Board all material it submitted to the **Commissioner** and **Comptroller**. Three (3) complete copies of the **Agency** response shall be provided to the Contract Dispute Resolution Board and one to the **Contractor**. Extensions of time for submittal of the **Agency** response shall be given as necessary upon a showing of good cause or, upon consent of the parties, for an initial period of up to thirty (30) Days.

27.7.3 Further Proceedings. The Contract Dispute Resolution Board shall permit the **Contractor** to present its case by submission of memoranda, briefs, and oral argument. The Contract Dispute Resolution Board shall also permit the **Agency** to present its case in response to the **Contractor** by submission of memoranda, briefs, and oral argument. If requested by the **City** Corporation Counsel, the **Comptroller** shall provide reasonable assistance in the preparation of the **Agency's** case. Neither the **Contractor** nor the **Agency** may support its case with any documentation or other material that was not considered by the **Comptroller**, unless requested by the Contract Dispute Resolution Board. The Contract Dispute Resolution Board, in its discretion, may seek such technical or other expert advice as it shall deem appropriate and may seek, on its own or upon application of a party, any such additional material from any party as it deems fit. The Contract Dispute Resolution Board, in its discretion, may combine more than one dispute between the parties for concurrent resolution.

27.7.4 Contract Dispute Resolution Board Determination. Within forty-five (45) **Days** of the conclusion of all written submissions and oral arguments, the Contract Dispute Resolution Board shall render a written decision resolving the dispute. In an unusually complex case, the Contract Dispute Resolution Board may render its decision in a longer period, not to exceed ninety (90) **Days**, and shall so advise the parties at the commencement of this period. The Contract Dispute Resolution Board's decision must be consistent with the terms of the **Contract**. Decisions of the Contract Dispute Resolution Board shall only resolve matters before the Contract Dispute Resolution Board and shall not have precedential effect with respect to matters not before the Contract Dispute Resolution Board.

27.7.5 Notification of Contract Dispute Resolution Board Decision. The Contract Dispute Resolution Board shall send a copy of its decision to the **Contractor**, the **ACCO**, the Engineer, the **Comptroller**, the **City** Corporation Counsel, the CCPO, and the **PPB**. A decision in favor of the **Contractor** shall be subject to the prompt payment provisions of the **PPB** Rules. The

Required Payment Date shall be thirty (30) Days after the date the parties are formally notified of the Contract Dispute Resolution Board's decision.

27.7.6 Finality of Contract Dispute Resolution Board Decision. The Contract Dispute Resolution Board's decision shall be final and binding on all parties. Any party may seek review of the Contract Dispute Resolution Board's decision solely in the form of a challenge, filed within four (4) months of the date of the Contract Dispute Resolution Board's decision, in a court of competent jurisdiction of the State of New York, County of New York pursuant to Article 78 of the Civil Practice Law and Rules. Such review by the court shall be limited to the question of whether or not the Contract Dispute Resolution Board's decision was made in violation of lawful procedure, was affected by an error of **Law**, or was arbitrary and capricious or an abuse of discretion. No evidence or information shall be introduced or relied upon in such proceeding that was not presented to the Contract Dispute Resolution Board in accordance with this Article 27.

27.8 Any termination, cancellation, or alleged breach of the **Contract** prior to or during the pendency of any proceedings pursuant to this Article 27 shall not affect or impair the ability of the **Commissioner** or Contract Dispute Resolution Board to make a binding and final decision pursuant to this Article 27.

ARTICLE 28. RECORD KEEPING FOR EXTRA OR DISPUTED WORK OR WORK ON ATIME & MATERIALS BASIS

28.1 While the **Contractor** or any of its **Subcontractors** is performing **Work** on a time and material basis or **Extra Work** on a time and material basis ordered by the **Commissioner** under Article 25, or where the **Contractor** believes that it or any of its **Subcontractors** is performing **Extra Work** but a final determination by **Agency** has not been made, or the **Contractor** or any of its **Subcontractors** is performing disputed **Work** (whether on or off the **Site**), or complying with a determination or order under protest in accordance with Articles 11, 27, and 30, in each such case the **Contractor** shall furnish the **Resident Engineer** daily with three (3) copies of written statements signed by the **Contractor's** representative at the **Site** showing:

28.1.1 The name, trade, and number of each worker employed on such **Work** or engaged in complying with such determination or order, the number of hours employed, and the character of the **Work** each is doing; and

28.1.2 The nature and quantity of any materials, plant and equipment furnished or used in connection with the performance of such **Work** or compliance with such determination or order, and from whom purchased or rented.

28.2 A copy of such statement will be countersigned by the **Resident Engineer**, noting thereon any items not agreed to or questioned, and will be returned to the **Contractor** within two (2) **Days** after submission.

28.3 The **Contractor** and its **Subcontractors**, when required by the **Commissioner**, or the **Comptroller**, shall also produce for inspection, at the office of the **Contractor** or **Subcontractor**, any and all of its books, bid documents, financial statements, vouchers, records, daily job diaries and reports, and cancelled checks, and any other documents relating to showing the nature and quantity of the labor, materials, plant and equipment actually used in the performance of such **Work**, or in complying with such determination or order, and the amounts expended therefor, and shall permit the **Commissioner** and the

Comptroller to make such extracts therefrom, or copies thereof, as they or either of them may desire.

28.4 In connection with the examination provided for herein, the **Commissioner**, upon demand therefor, will produce for inspection by the **Contractor** such records as the **Agency** may have withrespect to such **Extra Work** or disputed **Work** performed under protest pursuant to order of the **Commissioner**, except those records and reports which may have been prepared for the purpose of determining the accuracy and validity of the **Contractor's** claim.

28.5 Failure to comply strictly with these requirements shall constitute a waiver of any claim for extra compensation or damages on account of the performance of such **Work** or compliance with such determination or order.

ARTICLE 29. OMITTED WORK

29.1 If any **Contract Work** in a lump sum **Contract**, or if any part of a lump sum item in a unit price, lump sum, or percentage-bid **Contract** is omitted by the **Commissioner** pursuant to Article 33, the **Contract** price, subject to audit by the EAO, shall be reduced by a pro rata portion of the lump sum bid amount based upon the percent of **Work** omitted subject to Article 29.4. For the purpose of determining the pro rata portion of the lump sum bid amount, the bid breakdown submitted in accordance with Article 41 shall be considered, but shall not be the determining factor.

29.2 If the whole of a lump sum item or units of any other item is so omitted by the **Commissioner** in a unit price, lump sum, or percentage-bid **Contract**, then no payment will be made therefor except as provided in Article 29.4.

29.3 For units that have been ordered but are only partially completed, the unit price shall be reduced by a pro rata portion of the unit price bid based upon the percentage of **Work** omitted subject to Article 29.4.

29.4 In the event the **Contractor**, with respect to any omitted **Work**, has purchased any non-cancelable material and/or equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract**, but not yet incorporated into the **Work**, the **Contractor** shall be paid for such material and/or equipment in accordance with Article 64.2.1(b); provided, however, such payment is contingent upon the **Contractor's** delivery of such material and/or equipment in acceptable condition to a location designated by the **City**.

29.5 The **Contractor** agrees to make no claim for damages or for loss of overhead and profit with regard to any omitted **Work**.

ARTICLE 30. NOTICE AND DOCUMENTATION OF COSTS AND DAMAGES; PRODUCTION OF FINANCIAL RECORDS

30.1 If the **Contractor** shall claim to be sustaining damages by reason of any act or omission of the **City** or its agents, it shall submit to the **Commissioner** within forty-five (45) **Days** from the time such damages are first incurred, and every thirty (30) **Days** thereafter to the extent additional damages are being incurred for the same condition, verified statements of the details and the amounts of such damages, together with documentary evidence of such damages. The **Contractor** may submit any of the above statements within such additional time as may be granted by the **Commissioner** in writing upon written request therefor. Failure of the **Commissioner** to respond in writing to a written request for additional time within thirty (30) **Days** shall be deemed a denial of the request. On failure of the **Contractor** to strictly comply with

the foregoing provisions, such claims shall be deemed waived and no right to recover on such claims shall exist. Damages that the **Contractor** may claim in any action or dispute resolution procedure arising under or by reason of this **Contract** shall not be different from or in excess of the statements and documentation made pursuant to this Article 30. This Article 30.1 does not apply to claims submitted to the **Commissioner** pursuant to Article 11 or to claims disputing a determination under Article 27.

30.2 In addition to the foregoing statements, the **Contractor** shall, upon notice from the **Commissioner**, produce for examination at the **Contractor's** office, by the **Engineer**, **Architect** or **Project Manager**, all of its books of account, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books, and cancelled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this **Contract**, and submit itself and persons in its employment, for examination under oath by any person designated by the **Commissioner** or **Comptroller** to investigate claims made or disputes against the **City** under this **Contract**. At such examination, a duly authorized representative of the **Contractor** may be present.

30.3 In addition to the statements required under Article 28 and this Article 30, the **Contractor** and/or its **Subcontractor** shall, within thirty (30) **Days** upon notice from the **Commissioner** or **Comptroller**, produce for examination at the **Contractor's** and/or **Subcontractor's** office, by a representative of either the **Commissioner** or **Comptroller**, all of its books of account, bid documents, financial statements, accountant workpapers, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books, and cancelled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this **Contract**. Further, the **Contractor** and/or its **Subcontractor** shall submit any person in its employment, for examination under oath by any person designated by the **Commissioner** or **Comptroller** to investigate claims made or disputes against the **City** under this **Contract**. At such examination, a duly authorized representative of the **Contractor** may be present.

30.4 Unless the information and examination required under Article 30.3 is provided by the **Contractor** and/or its **Subcontractor** upon thirty (30) **Days'** notice from the **Commissioner** or **Comptroller**, or upon the **Commissioner's** or **Comptroller's** written authorization to extend the time to comply, the **City** shall be released from all claims arising under, relating to or by reason of this **Contract**, except for sums certified by the **Commissioner** to be due under the provisions of this **Contract**. It is further stipulated and agreed that no person has the power to waive any of the foregoing provisions and that in any action or dispute resolution procedure against the **City** to recover any sum in excess of the sums certified by the **Commissioner** to be due under or by reason of this **Contract**, the **Contractor** must allege in its complaint and prove, at trial or during such dispute resolution procedure, compliance with the provisions of this Article 30.

30.5 In addition, after the commencement of any action or dispute resolution procedure by the **Contractor** arising under or by reason of this **Contract**, the **City** shall have the right to require the **Contractor** to produce for examination under oath, up until the trial of the action or hearing before the Contract Dispute Resolution Board, the books and documents described in Article 30.3 and submit itself and all persons in its employ for examination under oath. If this Article 30 is not complied with as required, then the **Contractor** hereby consents to the dismissal of the action or dispute resolutionprocedure.

CHAPTER VII: POWERS OF THE RESIDENT ENGINEER, THE ENGINEER ORARCHITECT AND THE COMMISSIONER

ARTICLE 31. THE RESIDENT ENGINEER

31.1 The **Resident Engineer** shall have the power to inspect, supervise, and control the performance

of the **Work**, subject to review by the **Commissioner**. The **Resident Engineer** shall not, however, have the power to issue an **Extra Work** order, except as specifically designated in writing bythe **Commissioner**.

ARTICLE 32. THE ENGINEER OR ARCHITECT OR PROJECT MANAGER

32.1 The **Engineer** or **Architect** or **Project Manager**, in addition to those matters elsewhere herein delegated to the **Engineer** and expressly made subject to his/her determination, direction or approval, shall have the power, subject to review by the **Commissioner**:

32.1.1 To determine the amount, quality, and location of the **Work** to be paid for hereunder; and

32.1.2 To determine all questions in relation to the **Work**, to interpret the **Contract Drawings**, **Specifications**, and **Addenda**, and to resolve all patent inconsistencies or ambiguities therein; and

32.1.3 To determine how the **Work** of this **Contract** shall be coordinated with **Work** of **Other Contractors** engaged simultaneously on this **Project**, including the power to suspend any part of the **Work**, but not the whole thereof; and

32.1.4 To make minor changes in the **Work** as he/she deems necessary, provided such changes do not result in a net change in the cost to the **City** or to the **Contractor** of the **Work** to be done under the **Contract**; and

32.1.5 To amplify the **Contract Drawings**, add explanatory information and furnish additional **Specifications** and drawings, consistent with this **Contract**.

32.2 The foregoing enumeration shall not imply any limitation upon the power of the **Engineer** or **Architect** or **Project Manager**, for it is the intent of this **Contract** that all of the **Work** shall generally be subject to his/her determination, direction, and approval, except where the determination, direction or approval of someone other than the **Engineer** or **Architect** or **Project Manager** is expressly called for herein.

32.3 The **Engineer** or **Architect** or **Project Manager** shall not, however, have the power to issuean **Extra Work** order, except as specifically designated in writing by the **Commissioner**.

ARTICLE 33. THE COMMISSIONER

33.1 The **Commissioner**, in addition to those matters elsewhere herein expressly made subject to his/her determination, direction or approval, shall have the power:

33.1.1 To review and make determinations on any and all questions in relation to this **Contract** and its performance; and

33.1.2 To modify or change this **Contract** so as to require the performance of **Extra Work** (subject, however, to the limitations specified in Article 25) or the omission of **Contract Work**; and

33.1.3 To suspend the whole or any part of the **Work** whenever in his/her judgment such suspension is required:

33.1.3(a) In the interest of the **City** generally; or

33.1.3(b) To coordinate the **Work** of the various contractors engaged on this **Project** pursuant to the provisions of Article 12; or

33.1.3(c) To expedite the completion of the entire **Project** even though the completion of this particular **Contract** may thereby be delayed.

ARTICLE 34. NO ESTOPPEL

34.1 Neither the **City** nor any **Agency**, official, agent or employee thereof, shall be bound, precluded or estopped by any determination, decision, approval, order, letter, payment or certificate made or given under or in connection with this **Contract** by the **City**, the **Commissioner**, the **Engineer**, the **Resident Engineer**, or any other official, agent or employee of the **City**, either before or after the final completion and acceptance of the **Work** and payment therefor:

34.1.1 From showing the true and correct classification, amount, quality or character of the **Work** actually done; or that any such determination, decision, order, letter, payment or certificate was untrue, incorrect or improperly made in any particular, or that the **Work**, or any part thereof, does not in fact conform to the requirements of this **Contract**; and

34.1.2 From demanding and recovering from the **Contractor** any overpayment made to it, or such damages as the **City** may sustain by reason of the **Contractor's** failure to perform each and every part of its **Contract**.

CHAPTER VIII: LABOR PROVISIONS

ARTICLE 35. EMPLOYEES

35.1 The **Contractor** and its **Subcontractors** shall not employ on the **Work**:

35.1.1 Anyone who is not competent, faithful and skilled in the **Work** for which he/she shall be employed; and whenever the **Commissioner** shall inform the **Contractor**, in writing, that any employee is, in his/her opinion, incompetent, unfaithful or disobedient, that employee shall be discharged from the **Work** forthwith, and shall not again be employed upon it; or

35.1.2 Any labor, materials or means whose employment, or utilization during the course of this **Contract**, may tend to or in any way cause or result in strikes, work stoppages, delays, suspension of **Work** or similar troubles by workers employed by the **Contractor** or its **Subcontractors**, or by any of the trades working in or about the buildings and premises where **Work** is being performed under this **Contract**, or by **Other Contractors** or their **Subcontractors** pursuant to other contracts, or on any other building or premises owned or operated by the **City**, its **Agencies**, departments, boards or authorities. Any violation by the **Contractor** of this requirement may, upon certification of the **Commissioner**, be considered as proper and sufficient cause for declaring the **Contractor** to be in default, and for the **City** to take action against it as set forth in Chapter X of this **Contract**, or such other article of this **Contract** as the Commissioner may deem proper; or

35.1.3 In accordance with Section 220.3-e of the Labor Law of the State of New York (hereinafter "Labor Law"), the **Contractor** and its **Subcontractors** shall not employ on the **Work** any apprentice, unless he/she is a registered individual, under a bona fide program registered with the New York State Department of Labor. The allowable ratio of apprentices to journey-level workers in any craft classification shall not be greater than the ratio permitted to the **Contractor** as to its work force on any job under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered as above, shall be paid the wage rate determined by the **Comptroller** of the **City** for the classification of **Work** actually performed. The **Contractor** or **Subcontractor** will be required to furnish written evidence of the registration of its program and apprentices as well as all the appropriate ratios and wage rates, for the area of the construction prior to using any apprentices on the **Contract Work**.

35.2 If the total cost of the **Work** under this **Contract** is at least two hundred fifty thousand ($250,000) dollars, all laborers, workers, and mechanics employed in the performance of the C**ontract** on the public work site, either by the **Contractor**, **Subcontractor** or other person doing or contracting to do the whole or a part of the **Work** contemplated by the **Contract**, shall be certified prior to performing any **Work** as having successfully completed a course in construction safety and health approved by the United States Department of Labor's Occupational Safety and Health Administration that is at least ten (10) hours in duration.

35.3 In accordance with Local Law Nos. 30-2012 and 33-2012, codified at sections 6-132 and 12-113 of the Administrative Code, respectively,

35.3.1 The **Contractor** shall not take an adverse personnel action with respect to an officer or employee in retaliation for such officer or employee making a report of information concerning conduct which such officer or employee knows or reasonably believes to involve corruption, criminal activity, conflict of interest, gross mismanagement or abuse of authority by any officer or employee relating to this **Contract** to (a) the Commissioner of the Department of Investigation, (b) a member of the New York City Council, the Public Advocate, or the **Comptroller**, or (c) the **CCPO**, **ACCO**, **Agency** head, or **Commissioner**.

35.3.2 If any of the **Contractor**'s officers or employees believes that he or she has been the subject of an adverse personnel action in violation of Article 35.3.1, he or she shall be entitled to bring a cause of action against the **Contractor** to recover all relief necessary to make him or her whole. Such relief may include but is not limited to: (a) an injunction to restrain continued retaliation, (b) reinstatement to the position such employee would have had but for the retaliation or to an equivalent position, (c) reinstatement of full fringe benefits and seniority rights, (d) payment of two times back pay, plus interest, and (e) compensation for any special damages sustained as a result of the retaliation, including litigation costs and reasonable attorney's fees.

35.3.3 The **Contractor** shall post a notice provided by the **City** in a prominent and accessible place on any site where work pursuant to the **Contract** is performed that contains information about:

35.3.3(a) how its employees can report to the New York City Department of Investigation allegations of fraud, false claims, criminality or corruption arising outof or in connection with the **Contract**; and

35.3.3(b) the rights and remedies afforded to its employees under Administrative Code sections 7-805 (the New York City False Claims Act) and 12-113 (the Whistleblower Protection Expansion Act) for lawful acts taken in connection withthe

reporting of allegations of fraud, false claims, criminality or corruption in connection with the **Contract**.

35.3.4 For the purposes of this Article 35.3, "adverse personnel action" includes dismissal, demotion, suspension, disciplinary action, negative performance evaluation, any action resulting in loss of staff, office space, equipment or other benefit, failure to appoint, failure to promote, or any transfer or assignment or failure to transfer or assign against the wishes of the affected officer or employee.

35.3.5 This Article 35.3 is applicable to all of the **Contractor**'s **Subcontractors** having subcontracts with a value in excess of $100,000; accordingly, the **Contractor** shall include this rider in all subcontracts with a value a value in excess of $100,000.

35.4 Article 35.3 is not applicable to this **Contract** if it is valued at $100,000 or less. Articles 35.3.1, 35.3.2, 35.3.4, and 35.3.5 are not applicable to this **Contract** if it was solicited pursuant to a finding of an emergency.

35.5 Paid Sick Leave Law.

35.5.1 Introduction and General Provisions.

35.5.1(a) The Earned Sick Time Act, also known as the Paid Sick Leave Law ("PSLL"), requires covered employees who annually perform more than 80 hours of work in New York City to be provided with paid sick time[2]. Contractors of the **City** or of other governmental entities may be required to provide sick time pursuant to the PSLL.

35.5.1(b) The PSLL became effective on April 1, 2014, and is codified at Title 20, Chapter 8, of the New York City Administrative Code. It is administered by the City's Department of Consumer Affairs ("DCA"); DCA's rules promulgated under the PSLL are codified at Chapter 7 of Title 6 of the Rules of the City of New York ("Rules").

35.5.1(c) The **Contractor** agrees to comply in all respects with the PSLL and the Rules, and as amended, if applicable, in the performance of this **Contract**. The **Contractor** further acknowledges that such compliance is a material term of this **Contract** and that failure to comply with the PSLL in performance of this **Contract** may result in its termination.

35.5.1(d) The **Contractor** must notify the **Agency Chief Contracting Officer** of the **Agency** with whom it is contracting in writing within ten (10) days of receipt of a complaint (whether oral or written) regarding the PSLL involving the performance of this **Contract**. Additionally, the **Contractor** must cooperate with DCA's education efforts and must comply with DCA's subpoenas and other document demands as set forth in the PSLL and Rules.

35.5.1(e) The PSLL is summarized below for the convenience of the **Contractor**. The **Contractor** is advised to review the PSLL and Rules in their entirety. On the

[2] Pursuant to the PSLL, if fewer than five employees work for the same employer, as determined pursuant to New York City Administrative Code § 20-912(g), such employer has the option of providing such employees uncompensated sick time.

website www.nyc.gov/PaidSickLeave there are links to the PSLL and the associated Rules as well as additional resources for employers, such as Frequently Asked Questions, timekeeping tools and model forms, and an event calendar of upcoming presentations and webinars at which the **Contractor** can get more information about how to comply with the PSLL. The **Contractor** acknowledges that it is responsible for compliance with the PSLL notwithstanding any inconsistent language contained herein.

35.5.2 Pursuant to the PSLL and the Rules: Applicability, Accrual, and Use.

35.5.2(a) An employee who works within the City of New York for more than eighty hours in any consecutive 12-month period designated by the employer as its "calendar year" pursuant to the PSLL ("Year") must be provided sick time. Employers must provide a minimum of one hour of sick time for every 30 hours worked by an employee and compensation for such sick time must be provided at the greater of the employee's regular hourly rate or the minimum wage. Employers are not required to provide more than 40 hours of sick time to an employee in any Year.

35.5.2(b) An employee has the right to determine how much sick time he or she will use, provided that employers may set a reasonable minimum increment for the use of sick time not to exceed four hours per **Day**. In addition, an employee may carry over up to 40 hours of unused sick time to the following Year, provided that no employer is required to allow the use of more than forty hours of sick time in a Year or carry over unused paid sick time if the employee is paid for such unused sick time and the employer provides the employee with at least the legally required amount of paid sick time for such employee for the immediately subsequent Year on the first **Day** of such Year.

35.5.2(c) An employee entitled to sick time pursuant to the PSLL may use sick time for any of the following:

i. such employee's mental illness, physical illness, injury, or health condition or the care of such illness, injury, or condition or such employee's need for medical diagnosis or preventive medical care;
ii. such employee's care of a family member (an employee's child, spouse, domestic partner, parent, sibling, grandchild or grandparent, or the child or parent of an employee's spouse or domestic partner) who has a mental illness, physical illness, injury or health condition or who has a need for medical diagnosis or preventive medical care;
iii. closure of such employee's place of business by order of a public official due to a public health emergency; or
iv. such employee's need to care for a child whose school or childcare providerhas been closed due to a public health emergency.

35.5.2(d) An employer must not require an employee, as a condition of taking sick time, to search for a replacement. However, an employer may require an employee to provide: reasonable notice of the need to use sick time; reasonable documentation that the use of sick time was needed for a reason above if for an absence of more than three consecutive work days; and/or written confirmation that an employee used sick time pursuant to the PSLL. However, an employer may not require documentation specifying the nature of a medical condition or otherwise require disclosure of the details of a medical condition as a condition of providing sick time and health information obtained solely due to an employee's use of sick time pursuant to the PSLL must be treated by the

employer as confidential.

35.5.2(e) If an employer chooses to impose any permissible discretionary requirement as a condition of using sick time, it must provide to all employees a written policy containing those requirements, using a delivery method that reasonably ensures that employees receive the policy. If such employer has not provided its written policy, it may not deny sick time to an employee because of non-compliance with such a policy.

35.5.2(f) Sick time to which an employee is entitled must be paid no later than the payday for the next regular payroll period beginning after the sick time was used.

35.5.3 Exemptions and Exceptions. Notwithstanding the above, the PSLL does not apply to any of the following:

35.5.3(a) an independent contractor who does not meet the definition of employee under section 190(2) of the New York State Labor Law;

35.5.3(b) an employee covered by a valid collective bargaining agreement in effect on April 1, 2014, until the termination of such agreement;

35.5.3(c) an employee in the construction or grocery industry covered by a valid collective bargaining agreement if the provisions of the PSLL are expressly waived in such collective bargaining agreement;

35.5.3(d) an employee covered by another valid collective bargaining agreement if such provisions are expressly waived in such agreement and such agreement provides a benefit comparable to that provided by the PSLL for such employee;

35.5.3(e) an audiologist, occupational therapist, physical therapist, or speech language pathologist who is licensed by the New York State Department of Education and who calls in for work assignments at will, determines his or her own schedule, has the ability to reject or accept any assignment referred to him or her, and is paid an average hourly wage that is at least four times the federal minimum wage;

35.5.3(f) an employee in a work study program under Section 2753 of Chapter 42 of the United States Code;

35.5.3(g) an employee whose work is compensated by a qualified scholarship program as that term is defined in the Internal Revenue Code, Section 117 of Chapter 20 of the United States Code; or

35.5.3(h) a participant in a Work Experience Program (WEP) under section 336-c of the New York State Social Services Law.

35.5.4 Retaliation Prohibited. An employer may not threaten or engage in retaliation against an employee for exercising or attempting in good faith to exercise any right provided by the PSLL. In addition, an employer may not interfere with any investigation, proceeding, or hearing pursuant to the PSLL.

35.5.5 Notice of Rights.

35.5.5(a) An employer must provide its employees with written notice of their rights pursuant to the PSLL. Such notice must be in English and the primary language spoken

by an employee, provided that DCA has made available a translation into such language. Downloadable notices are available on DCA's website at http://www.nyc.gov/html/dca/html/law/PaidSickLeave.shtml.

35.5.5(b) Any person or entity that willfully violates these notice requirements is subject to a civil penalty in an amount not to exceed fifty dollars for each employee who was not given appropriate notice.

35.5.6 Records. An employer must retain records documenting its compliance with the PSLL for a period of at least three years, and must allow DCA to access such records in furtherance of an investigation related to an alleged violation of the PSLL.

35.5.7 Enforcement and Penalties.

35.5.7(a) Upon receiving a complaint alleging a violation of the PSLL, DCA has the right to investigate such complaint and attempt to resolve it through mediation. Within 30 **Days** of written notification of a complaint by DCA, or sooner in certain circumstances, the employer must provide DCA with a written response and such other information as DCA may request. If DCA believes that a violation of the PSLL has occurred, it has the right to issue a notice of violation to the employer.

35.5.7(b) DCA has the power to grant an employee or former employee all appropriate relief as set forth in New York City Administrative Code § 20-924(d). Such relief may include, among other remedies, treble damages for the wages that should have been paid, damages for unlawful retaliation, and damages and reinstatement for unlawful discharge. In addition, DCA may impose on an employer found to have violated the PSLL civil penalties not to exceed $500 for a first violation, $750 for a second violation within two years of the first violation, and
$1,000 for each succeeding violation within two years of the previous violation.

35.5.8 More Generous Polices and Other Legal Requirements. Nothing in the PSLL is intended to discourage, prohibit, diminish, or impair the adoption or retention of a more generous sick time policy, or the obligation of an employer to comply with any contract,

collective bargaining agreement, employment benefit plan or other agreement providing more generous sick time. The PSLL provides minimum requirements pertaining to sick time and does not preempt, limit or otherwise affect the applicability of any other law, regulation, rule, requirement, policy or standard that provides for greater accrual or use by employees of sick leave or time, whether paid or unpaid, or that extends other protections to employees. The PSLL may not be construed as creating or imposing any requirement in conflict with any federal or state law, rule or regulation.

35.6 HireNYC: Hiring and Reporting Requirements. This Article 35.6 applies to construction contracts of $1,000,000 or more. The **Contractor** shall comply with the requirements of Articles 35.6.1-35.6.5 for all non-trades jobs (e.g., for an administrative position arising out of **Work** ant located in New York City). The **Contractor** shall reasonably cooperate with SBS and the **City** on specific outreach events, including "Hire-on-the-Spot" events, for the hiring of trades workers in connection with the **Work**. If provided elsewhere in this **Contract**, this **Contract** is subject to a project labor agreement.

35.6.1 Enrollment. The **Contractor** shall enroll with the HireNYC system, found at www.nyc.gov/sbs, within thirty (30) days after the registration of this **Contract** pursuant to Section 328 of the New York City Charter. The **Contractor** shall provide information about the business, designate a primary contact and say whether it intends to hire for any entry

to mid-level job opportunities arising from this **Contract** and located in New York City, and, if so, the approximate start date of the first hire.

35.6.2 Job Posting Requirements.

35.6.2(a) Once enrolled in HireNYC, the **Contractor** agrees to update the HireNYC portal with all entry to mid-level job opportunities arising from this **Contract** and located in New York City, if any, which shall be defined as jobs requiring no more than an associate degree, as provided by the New York State Department of Labor (see Column F of https://labor.ny.gov/stats/2012-2022- NYS- Employment-Prospects.xls). The information to be updated includes the types of entry and mid-level positions made available from the work arising from the **Contract** and located in New York City, the number of positions, the anticipated schedule of initiating the hiring process for these positions, and the contact information for the **Contractor's** representative charged with overseeing hiring. The **Contractor** must update the HireNYC portal with any hiring needs arising from the contract and located in New York City, and the requirements of the jobs to be filled, no less than three weeks prior to the intended first day of employment for each new position, except with the permission of SBS, not to be unreasonably withheld, and must also update the HireNYC portal as set forth below.

35.6.2(b) After enrollment through HireNYC and submission of relevant information, SBS will work with the **Contractor** to develop a recruitment plan which will outline the candidate screening process, and will provide clear instructions as to when, where, and how interviews will take place. HireNYC will screen applicants based on employer requirements and refer applicants whom it believes are qualified to the **Contractor** for interviews. The **Contractor** must interview referred applicants whom it believes are qualified.

35.6.2(c) After completing an interview of a candidate referred by HireNYC, the **Contractor** must provide feedback via the portal within twenty (20) business days to indicate which candidates were interviewed and hired, if any. In addition, the **Contractor** shall provide the start date of new hires, and additional information reasonably related to such hires, within twenty (20) business days after the start date. In the event the **Contractor** does not have any job openings covered by this Rider in any given year, the **Contractor** shall be required to provide an annual update to HireNYC to that effect. For this purpose, the reporting year shall run from the date of the registration of the **Contract** pursuant to Charter section 328 and each anniversary date.

35.6.2(d) These requirements do not limit the **Contractor's** ability to assess the qualifications of prospective workers, and to make final hiring and retention decisions. No provision of this Article 35.6 shall be interpreted so as to require the **Contractor** to employ any particular worker.

35.6.2(e) In addition, the provisions of this Article 35.6 shall not apply to positions that the **Contractor** intends to fill with employees employed pursuant to the job retention provision of Section 22-505 of the Administrative Code of the City of New York. The **Contractor** shall not be required to report such openings with HireNYC. However, the **Contractor** shall enroll with the HireNYC system pursuant to Article 35.6.1, above, and, if such positions subsequently become open, then the remaining provisions of this Article 35.6 will apply.

35.6.3 Breach and Liquidated Damages. If the **Contractor** fails to comply with the termsof the **ContrSact** and this Article 35.6 (l) by not enrolling its business with HireNYC; (2) by not informing HireNYC, as required, of open positions; or (3) by failing to interview a qualified candidate, the **Agency** may assess liquidated damages in the amount of two- thousand five hundred dollars ($2,500) per breach. For all other events of noncompliance with the terms of this Article 35.6, the **Agency** may assess liquidated damages in the amount of five hundred dollars ($500) per breach. Furthermore, in the event the **Contractor** breaches the requirements of this Article 35.6 during the term of the **Contract**, the **City** may hold the **Contractor** in default of this **Contract**.

35.6.4 Audit Compliance. In addition to the auditing requirements set forth in other partsof the **Contract**, the **Contractor** shall permit SBS and the **City** to inspect any and all records concerning or relating to job openings or the hiring of individuals for work arising from the **Contract** and located in New York City. The **Contractor** shall permit an inspection within seven (7) business days of the request.

35.6.5 Other Reporting Requirements. The **Contractor** shall report to the **City**, on amonthly basis, all information reasonably requested by the **City** that is necessary for the **City** to comply with any reporting requirements imposed by **Law**, including any requirement that the **City** maintain a publicly accessible database. In addition, the **Contractor** agrees to comply with all reporting requirements imposed by **Law**, or as otherwise requested by the **City**.

35.6.6 Federal Hiring Requirements. If this **Contract** is federally funded (as indicated elsewhere in this Contract), the **Contractor** shall comply with all federal hiring requirements as may be set forth in this **Contract**, including, as applicable: (a) Section 3 of the HUD Act of 1968, which requires, to the greatest extent feasible, economic opportunities for 30 percent of new hires be given to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing and Executive Order 11246, which prohibits discrimination in employment due to race, color, religion,sex or national origin, and requires the implementation of goals for minority and female participation for work involving any construction trade.

ARTICLE 36. NO DISCRIMINATION

36.1 The **Contractor** specifically agrees, as required by Labor Law Section 220-e, as amended, that:

36.1.1 In the hiring of employees for the performance of **Work** under this **Contract** or any subcontract hereunder, neither the **Contractor**, **Subcontractor**, nor any person acting on behalf of such **Contractor** or **Subcontractor**, shall by reason of race, creed, color or national origin discriminate against any citizen of the State of New York who is qualifiedand available to perform the **Work** to which the employment relates;

36.1.2 Neither the **Contractor**, **Subcontractor**, nor any person on its behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of **Work** under this **Contract** on account of race, creed, color or national origin;

36.1.3 There may be deducted from the amount payable to the **Contractor** by the **City** under this **Contract** a penalty of fifty ($50.00) dollars for each person for each **Day** during which such person was discriminated against or intimidated in violation of the provisions of this

Contract; and

36.1.4 This **Contract** may be cancelled or terminated by the **City** and all moneys due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this Article 36.

36.1.5 This Article 36 covers all construction, alteration and repair of any public building or public work occurring in the State of New York and the manufacture, sale, and distribution of materials, equipment, and supplies to the extent that such operations are performed within the State of New York pursuant to this **Contract**.

36.2 The **Contractor** specifically agrees, as required by Section 6-108 of the Administrative Code,as amended, that:

36.2.1 It shall be unlawful for any person engaged in the construction, alteration or repairof buildings or engaged in the construction or repair of streets or highways pursuant to a **Contract** with the **City** or engaged in the manufacture, sale or distribution of materials, equipment or supplies pursuant to a **Contract** with the **City** to refuse to employ or to refuse to continue in any employment any person on account of the race, color or creed of such person.

36.2.2 It shall be unlawful for any person or any servant, agent or employee of any person, described in Article 36.1.2, to ask, indicate or transmit, orally or in writing, directly or indirectly, the race, color or creed or religious affiliation of any person employed or seeking employment from such person, firm or corporation.

36.2.3 Breach of the foregoing provisions shall be deemed a violation of a material provision of this **Contract**.

36.2.4 Any person, or the employee, manager or owner of or officer of such firm or corporation who shall violate any of the provisions of this Article 36.2 shall, upon conviction thereof, be punished by a fine of not more than one hundred ($100.00) dollars or by imprisonment for not more than thirty (30) **Days**, or both.

36.3 This **Contract** is subject to the requirements of Executive Order No. 50 (1980) ("E.O. 50"), as revised, and the rules and regulations promulgated thereunder. No contract will be awarded unless and until these requirements have been complied with in their entirety. By signing this **Contract**, the **Contractor** agrees that it:

36.3.1 Will not engage in any unlawful discrimination against any employee or applicantfor employment because of race, creed, color, national origin, sex, age, disability, marital status or sexual orientation with respect to all employment decisions including, but not limited to, recruitment, hiring, upgrading, demotion, downgrading, transfer, training, ratesof pay or other forms of compensation, layoff, termination, and all other terms and conditions of employment; and

36.3.2 Will not engage in any unlawful discrimination in the selection of **Subcontractors** on the basis of the owner's race, color, creed, national origin, sex, age, disability, marital status or sexual orientation; and

36.3.3 Will state in all solicitations or advertisements for employees placed by or on behalf of the **Contractor** that all qualified applicants will receive consideration for employment without unlawful discrimination based on race, creed, color, national origin, sex, age, citizens status,

disability, marital status, sexual orientation, or that it is an equal employment opportunity employer; and

36.3.4 Will send to each labor organization or representative of workers with which it has a collective bargaining agreement or other contract or memorandum of understanding, written notification of its equal employment opportunity commitments under E.O. 50 and the rules and regulations promulgated thereunder; and

36.3.5 Will furnish, before the award of the **Contract**, all information and reports, including an employment report, that are required by E.O. 50, the rules and regulations promulgated thereunder, and orders of the **City** Department of Business Services, Division of Labor Services (**DLS**) and will permit access to its books, records, and accounts by the **DLS** for the purposes of investigation to ascertain compliance with such rules, regulations, and orders.

36.4 The **Contractor** understands that in the event of its noncompliance with the nondiscrimination clauses of this **Contract** or with any of such rules, regulations, or orders, such noncompliance shall constitute a material breach of this **Contract** and noncompliance with E.O. 50 and the rules and regulations promulgated thereunder. After a hearing held pursuant to the rules of the **DLS**, the Director of the **DLS** may direct the **Commissioner** to impose any or all of the following sanctions:

36.4.1 Disapproval of the **Contractor**; and/or

36.4.2 Suspension or termination of the **Contract**; and/or

36.4.3 Declaring the **Contractor** in default; and/or

36.4.4 In lieu of any of the foregoing sanctions, the Director of the **DLS** may impose an employment program.

In addition to any actions taken under this **Contract**, failure to comply with E.O. 50 and the rules and regulations promulgated thereunder, in one or more instances, may result in a **City Agency** declaring the **Contractor** to be non-responsible in future procurements. The **Contractor** further agrees that it will refrain from entering into any **Contract** or **Contract** modification subject to E.O. 50 and the rules and regulations promulgated thereunder with a **Subcontractor** who is not in compliance with the requirements of E.O. 50 and the rules and regulations promulgated thereunder.

36.5 The **Contractor** specifically agrees, as required by Section 6-123 of the AdministrativeCode, that:

36.5.1 The **Contractor** will not engage in any unlawful discriminatory practice in violation of Title 8 of the Administrative Code; and

36.5.2 Any failure to comply with this Article 36.5 may subject the **Contractor** to the remedies set forth in Section 6-123 of the Administrative Code, including, where appropriate, sanctions such as withholding of payment, imposition of an employment program, finding the **Contractor** to be in default, cancellation of the **Contract**, or any other sanction or remedy provided by **Law** or **Contract**.

ARTICLE 37. LABOR LAW REQUIREMENTS

37.1 The **Contractor** shall strictly comply with all applicable provisions of the Labor Law, as

amended. Such compliance is a material term of this **Contract**.

37.2 The **Contractor** specifically agrees, as required by Labor Law Sections 220 and 220-d, as amended, that:

37.2.1 Hours of **Work**: No laborer, worker, or mechanic in the employ of the **Contractor**, **Subcontractor** or other person doing or contracting to do the whole or a part of the **Work** contemplated by this **Contract** shall be permitted or required to work more than eight (8) hours in any one (1) **Day**, or more than five (5) **Days** in any one (1) week, except as provided in the Labor Law and in cases of extraordinary emergency including fire, flood, or danger to life or property, or in the case of national emergency when so proclaimed by the President of the United States of America.

37.2.2 In situations in which there are not sufficient laborers, workers, and mechanics who may be employed to carry on expeditiously the **Work** contemplated by this **Contract** as a result of such restrictions upon the number of hours and **Days** of labor, and the immediate commencement or prosecution or completion without undue delay of the **Work** is necessary for the preservation of the **Site** and/or for the protection of the life and limb of the persons using the same, such laborers, workers, and mechanics shall be permitted or required to work more than eight (8) hours in any one (1) **Day**; or five (5) **Days** in any one (1) week; provided, however, that upon application of any **Contractor**, the **Commissioner** shall have first certified to the Commissioner of Labor of the State of New York (hereinafter "Commissioner of Labor") that such public **Work** is of an important nature and that a delay in carrying it to completion would result in serious disadvantage to the public; and provided, further, that such Commissioner of Labor shall have determined that such an emergency does in fact exist as provided in Labor Law Section 220.2.

37.2.3 Failure of the **Commissioner** to make such a certification to the Commissioner of Labor shall not entitle the **Contractor** to damages for delay or for any cause whatsoever.

37.2.4 Prevailing Rate of Wages: The wages to be paid for a legal day's **Work** to laborers, workers, or mechanics employed upon the **Work** contemplated by this **Contract** or upon any materials to be used thereon shall not be less than the "prevailing rate of wage" as defined in Labor Law Section 220, and as fixed by the **Comptroller** in the attached Schedule of Wage Rates and in updated schedules thereof. The prevailing wage rates and supplemental benefits to be paid are those in effect at the time the **Work** is being performed.

37.2.5 Requests for interpretation or correction in the Information for Bidders includes all requests for clarification of the classification of trades to be employed in the performance of the **Work** under this **Contract**. In the event that a trade not listed in the **Contract** is in fact employed during the performance of this **Contract**, the **Contractor** shall be required to obtain from the **Agency** the prevailing wage rates and supplementary benefits for the trades used and to complete the performance of this **Contract** at the price at which the **Contract** was awarded.

37.2.6 Minimum Wages: Except for employees whose wage is required to be fixed pursuant to Labor Law Section 220, all persons employed by the **Contractor** and any **Subcontractor** in the manufacture or furnishing of the supplies, materials, or equipment, or the furnishing of work, labor, or services, used in the performance of this **Contract**, shall be paid, without subsequent deduction or rebate unless expressly authorized by **Law**, not less than the sum mandated by **Law**.

37.3 Working Conditions: No part of the **Work**, labor or services shall be performed or rendered by

the **Contractor** in any plants, factories, buildings or surroundings or under working conditions which are unsanitary or hazardous or dangerous to the health and safety of employees engaged in the performance of this **Contract**. Compliance with the safety, sanitary, and factory inspection **Laws** of the state in which the **Work** is to be performed shall be prima facie evidence of compliance with this Article 37.3.

37.4 Prevailing Wage Enforcement: The **Contractor** agrees to pay for all costs incurred by the **City** in enforcing prevailing wage requirements, including the cost of any investigation conducted by or on behalf of the **Agency** or the **Comptroller,** where the **City** discovers a failure to comply with any of the requirements of this Article 37 by the **Contractor** or its **Subcontractor(s)**. The **Contractor** also agrees that, should it fail or refuse to pay for any such investigation, the **Agency** is hereby authorized to deduct from a **Contractor's** account an amount equal to the cost of such investigation.

37.4.1 The Labor Law Section 220 and Section 220-d, as amended, provide that this **Contract** shall be forfeited and no sum paid for any **Work** done hereunder on a second conviction for willfully paying less than:

37.4.1(a) The stipulated prevailing wage scale as provided in Labor Law section 220, as amended, or

37.4.1(b) The stipulated minimum hourly wage scale as provided in Labor Law section 220-d, as amended.

37.4.2 For any breach or violation of either working conditions (Article 37.3) or minimum wages (Article 37.2.6) provisions, the party responsible therefor shall be liable to the **City** for liquidated damages, which may be withheld from any amounts due on any contracts with the **City** of such party responsible, or may be recovered in actions brought by the **City** Corporation Counsel in the name of the **City**, in addition to damages for any other breach of this **Contract**, for a sum equal to the amount of any underpayment of wages due to any employee engaged in the performance of this **Contract**. In addition, the **Commissioner** shall have the right to cancel contracts and enter into other contracts for the completion of the original contract, with or without public letting, and the original **Contractor** shall be liable for any additional cost. All sums withheld or recovered as deductions, rebates, refunds, or underpayment of wages hereunder, shall be held in a special deposit account and shall be paid without interest, on order of the **Comptroller**, directly to the employees who have been paid less than minimum rates of pay as set forth herein and on whose account such sums were withheld or recovered, provided that no claims by employees for such payments shall be entertained unless made within two (2) years from the date of actual notice to the **Contractor** of the withholding or recovery of such sums by the **City**.

37.4.3 A determination by the **Comptroller** that a **Contractor** and/or its **Subcontractor** willfully violated Labor Law Section 220 will be forwarded to the **City's** five District Attorneys for review.

37.4.4 The **Contractor's** or **Subcontractor's** noncompliance with this Article 37.4 and Labor Law Section 220 may result in an unsatisfactory performance evaluation and the **Comptroller** may also find and determine that the **Contractor** or **Subcontractor** willfully violated the New York Labor **Law**.

37.4.4(a) An unsatisfactory performance evaluation for noncompliance with this Article 37.4 may result in a determination that the **Contractor** is a non-responsible bidder on subsequent procurements with the **City** and thus a rejection of a future award

of a contract with the **City**, as well as any other sanctions provided for by **Law**.

37.4.4(b) Labor Law Section 220-b, as amended, provides that when two (2) final determinations have been rendered against a **Contractor** or **Subcontractor** within any consecutive six (6) year period determining that such **Contractor** or **Subcontractor** has willfully failed to pay the prevailing rate of wages or to provide supplements in accordance with the Labor Law and this Article 37.4, whether such failures were concurrent or consecutive and whether or not such final determinations concerning separate public works projects are rendered simultaneously, such **Contractor** or **Subcontractor** shall be ineligible to submit a bid on or be awarded any public works contract with the **City** for a period of five (5) years from the second final determination. If the final determination involves the falsification of payroll records or the kickback of wages or supplements, the **Contractor** or **Subcontractor** shall be ineligible to submit a bid on or be awarded any public works contract with the **City** for a period of five (5) years from the first final determination.

37.4.4(c) Labor Law Section 220, as amended, provides that the **Contractor** or **Subcontractor** found to have violated this Article 37.4 may be directed to make payment of wages or supplements including interest found to be due, and the **Contractor** or **Subcontractor** may be directed to make payment of a further sum 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 orshe is working. If the total cost of the **Work** under this **Contract** is at least two hundred fifty thousand ($250,000) dollars, such notice shall also include a statement that each worker, laborer or mechanic must be certified prior to performing any **Work** as having successfully completed a course in construction safety and health approved by the United States Department of Labor's Occupational Safety and Health Administration that is at least ten (10) hours in duration. Such notice shall be distributed to each worker before he or she starts performing any **Work** of this **Contract** and with the first paycheck after July first of each year. "Worker, laborer or mechanic" includes employees of the **Contractor** and all **Subcontractors** and all employees of suppliers entering the **Site**. At the time of distribution, the **Contractor** shall have each worker, laborer or mechanic sign a statement, in a form provided by the **Agency**, certifying that the worker has received the notice required by this Article 37.6.3, which signed statement shall be maintained with the payroll records required by this **Contract**; and

37.6.3(a) The **Contractor** and each **Subcontractor** shall notify each worker, laborer or mechanic employed under this **Contract** in writing of the prevailing rate of wages for their particular job classification. Such notification shall be given to every worker, laborer, and mechanic on their first pay stub and with every pay stub thereafter; and

37.6.4 **Site** Laminated Identification Badges: The **Contractor** shall provide laminated identification badges which include a photograph of the worker's, laborer's or mechanic's face and indicate the worker's, laborer's or mechanic's name, trade, employer's name, and employment starting date (month/day/year). Further, the **Contractor** shall require as acondition of employment on the **Site**, that each and every worker, laborer or mechanic wear the laminated identification badge at all times and that it may be seen by any representative of the **City**. The **Commissioner** may grant a written waiver from the requirement that the laminated identification badge include a photograph if the **Contractor** demonstrates that the identity of an individual wearing a laminated identification badge can be easily verified by another method; and

37.6.5 Language Other Than English Used On **Site**: Provide the **ACCO** notice when three (3) or more employees (worker and/or laborer and/or mechanic) on the **Site**, at any time, speak a language other than English. The **ACCO** will then provide the **Contractor** the notices described in Article 37.6.1 in that language or languages as may be required. The **Contractor** is responsible for all distributions under this Article 37; and

37.6.6 Provision of Records: The **Contractor** and **Subcontractor(s)** shall produce within five (5) **Days** on the **Site** of the **Work** and upon a written order of the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, or the **Comptroller,** such records as are required to be kept by this Article 37.6; and

37.6.7 The **Contractor** and **Subcontractor(s)** shall pay employees by check or direct deposit. If this **Contract** is for an amount greater than one million ($1,000,000) dollars, checks issued by the **Contractor** to covered employees shall be generated by a payroll service or automated payroll system (an in-house system may be used if approved by the **Agency**). For any subcontract for an amount greater than seven hundred fifty thousand ($750,000) dollars, checks issued by a **Subcontractor** to covered employees shall be generated by a payroll service or automated payroll system (an in-house system may be usedif approved by the **Agency**); and

37.6.8 The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of Articles 37.6.1 through 37.6.7 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract**.

37.7 The **Contractor** and its **Subcontractors** shall keep such employment and payroll records as are required by Section 220 of the Labor Law. The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of this Article 37.7 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract.**

37.8 At the time the **Contractor** makes application for each partial payment and for final payment, the **Contractor** shall submit to the **Commissioner** a written payroll certification, in the form provided by this **Contract**, of compliance with the prevailing wage, minimum wage, and other provisions and stipulations required by Labor Law Section 220 and of compliance with the training requirements of Labor Law Section 220-h set forth in Article 35.2. This certification of compliance shall be a condition precedent to payment and no payment shall be made to the **Contractor** unless and until each such certification shall have been submitted to and received by the **Commissioner**.

37.9 This **Contract** is executed by the **Contractor** with the express warranty and representation that the **Contractor** is not disqualified under the provisions of Section 220 of the Labor Law from the award of the **Contract**.

37.10 Any breach or violation of any of the foregoing shall be deemed a breach or violation of a material provision of this **Contract**, and grounds for cancellation thereof by the **City**.

ARTICLE 38. PAYROLL REPORTS

38.1 The **Contractor** and its **Subcontractor(s)** shall maintain on the **Site** during the performanceof the **Work** the original payrolls or transcripts thereof which the **Contractor** and its **Subcontractor(s)** are required to maintain and shall submit such original payrolls or transcripts, subscribed and affirmed by it as true, within thirty (30) **Days** after issuance of its first payroll, and every thirty (30) **Days** thereafter, pursuant to Labor Law Section 220(3-a)(a)(iii). The **Contractor** and **Subcontractor(s)** shall submit such original payrolls or transcripts along with each and every payment requisition. If payment requisitions are not submitted at least once a month, the **Contractor** and its **Subcontractor(s)** shall submit original payrolls and transcripts both along with its payment requisitions and independently of its payment requisitions.

38.2 The **Contractor** shall maintain payrolls or transcripts thereof for six (6) years from the date of completion of the **Work** on this **Contract**. If such payrolls and transcripts are maintained outside of New York City after the completion of the **Work** and their production is required pursuant to this Article 38, the **Contractor** shall produce such records in New York City upon request by the City.

38.3 The **Contractor** and **Subcontractor(s)** shall comply with any written order, direction, or request made by the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, the **Agency Labor Law**

Investigator(s), or the **Comptroller**, to provide to the requesting party any of the following information and/or records within five (5) **Days** of such written order, direction, or request:

38.3.1 Such original payrolls or transcripts thereof subscribed and affirmed by it as true and the statements signed by each worker pursuant to this Chapter VIII; and/or

38.3.2 Attendance sheets for each **Day** on which any employee of the **Contractor** and/or any of the **Subcontractor(s)** performed **Work** on the **Site**, which attendance sheet shall be in a form acceptable to the **Agency** and shall provide information acceptable to the **Agency** to identify each such employee; and/or

38.3.3 Any other information to satisfy the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, the **Agency Labor Law Investigator(s)** or the **Comptroller**, that this Chapter VIII and the Labor Law, as to the hours of employment and prevailing rates of wages and/or supplemental benefits, are being observed.

38.4 The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of Articles 38.1 and/or 38.2 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract**.

ARTICLE 39. DUST HAZARDS

39.1 Should a harmful dust hazard be created in performing the **Work** of this **Contract**, for the elimination of which appliances or methods have been approved by the Board of Standards and Appeals of the City of New York, such appliances and methods shall be installed, maintained, and effectively operated during the continuance of such harmful dust hazard. Failure to comply with this provision after notice shall make this **Contract** voidable at the sole discretion of the **City**.

CHAPTER IX: PARTIAL AND FINAL PAYMENTS

ARTICLE 40. CONTRACT PRICE

40.1 The **City** shall pay, and the **Contractor** agrees to accept, in full consideration for the **Contractor's** performance of the **Work** subject to the terms and conditions hereof, the lump sum 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 44and 45.

46.2 The **Contractor** is warned that the execution by it of a release, in connection with the acceptance of the final payment, containing language purporting to reserve claims other than those herein specifically excepted from the operation of this Article 46, or those for amounts deducted by the **Commissioner** from the final requisition or from the final payment as certified by the **Engineer** and approved by the **Commissioner**, shall not be effective to reserve such claims, anything stated to the **Contractor** orally or in writing by any official, agent or employee of the **City** to the contrary notwithstanding.

46.3 Should the **Contractor** refuse to accept the final payment as tendered by the **Comptroller**, it shall constitute a waiver of any right to interest thereon.

46.4 The **Contractor**, however, shall not be barred by this Article 46 from commencing an action for breach of **Contract** to the extent permitted by **Law** and by the terms of the **Contract** for any claims that are contained in the verified statement filed with the **Contractor's** substantial and final requisitions pursuant to Articles 44 and 45 or that arose after submission of the final payment requisition, provided that a detailed and verified statement of claim is served upon the contracting **Agency** and **Comptroller** not later than forty (40) **Days** after the making of such final payment by electronic funds transfer (EFT)or the mailing of such final payment. The statement shall specify the items upon which the claim will be based and any such claim shall be limited to such items.

ARTICLE 47. APPROVAL BY PUBLIC DESIGN COMMISSION

47.1 All works of art, including paintings, mural decorations, stained glass, statues, bas-reliefs, and other sculptures, monuments, fountains, arches, and other structures of a permanent character intendedfor ornament or commemoration, and every design of the same to be used in the performance of this **Contract**, and the design of all bridges, approaches, buildings, gates, fences, lamps, or structures to be erected, pursuant

to the terms of this **Contract**, shall be submitted to the Art Commission, d/b/a the Public Design Commission of the City of New York, and shall be approved by the Public Design Commission prior to the erection or placing in position of the same. The final payment shall not become due or payable under this **Contract** unless and until the Public Design Commission shall certify that the design for the **Work** herein contracted for has been approved by the said Public Design Commission, and that the same has been executed in substantial accordance with the design so approved, pursuant to the provisions of Chapter 37, Section 854 of the **City** Charter, as amended.

CHAPTER X: CONTRACTOR'S DEFAULT

ARTICLE 48. COMMISSIONER'S RIGHT TO DECLARE CONTRACTOR IN DEFAULT

48.1 In addition to those instances specifically referred to in other Articles herein, the **Commissioner** shall have the right to declare the **Contractor** in default of this **Contract** if:

48.1.1 The **Contractor** fails to commence **Work** when notified to do so by the **Commissioner**; or if

48.1.2 The **Contractor** shall abandon the **Work**; or if

48.1.3 The **Contractor** shall refuse to proceed with the **Work** when and as directed by the **Commissioner**; or if

48.1.4 The **Contractor** shall, without just cause, reduce its working force to a number which, if maintained, would be insufficient, in the opinion of the **Commissioner**, to complete the **Work** in accordance with the progress schedule; or if

48.1.5 The **Contractor** shall fail or refuse to increase sufficiently such working force when ordered to do so by the **Commissioner**; or if

48.1.6 The **Contractor** shall sublet, assign, transfer, convert or otherwise dispose of this **Contract** other than as herein specified; or sell or assign a majority interest in the **Contractor**; or if

48.1.7 The **Contractor** fails to secure and maintain all required insurance; or if

48.1.8 A receiver or receivers are appointed to take charge of the **Contractor's** property or affairs; or if

48.1.9 The **Commissioner** shall be of the opinion that the **Contractor** is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the **Work**, or the award of necessary subcontracts, or the placing of necessary material and equipment orders; or if

48.1.10 The **Commissioner** shall be of the opinion that the **Contractor** is or has been willfully or in bad faith violating any of the provisions of this **Contract**; or if

48.1.11 The **Commissioner** shall be of the opinion that the **Work** cannot be completed within the time herein provided therefor or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the

Commissioner's opinion, attributable to conditions within the **Contractor's** control; orif

48.1.12 The **Work** is not completed within the time herein provided therefor or within the time to which the **Contractor** may be entitled to have such completion extended; or if

48.1.13 Any statement or representation of the **Contractor** in the **Contract** or in any document submitted by the **Contractor** with respect to the **Work**, the **Project**, or the **Contract** (or for purposes of securing the **Contract**) was untrue or incorrect when made; or if

48.1.14 The **Contractor** or any of its officers, directors, partners, five (5%) percent shareholders, principals, or other persons substantially involved in its activities, commits any of the acts or omissions specified as the grounds for debarment in the **PPB** Rules.

48.2 Before the **Commissioner** shall exercise his/her right to declare the **Contractor** in default, the **Commissioner** shall give the **Contractor** an opportunity to be heard, upon not less than two (2) **Days**' notice.

ARTICLE 49. EXERCISE OF THE RIGHT TO DECLARE DEFAULT

49.1 The right to declare the **Contractor** in default for any of the grounds specified or referred to in Article 48 shall be exercised by sending the **Contractor** a notice, signed by the **Commissioner**, setting forth the ground or grounds upon which such default is declared (hereinafter referred to as a "Notice of Default").

49.2 The **Commissioner's** determination that the **Contractor** is in default shall be conclusive, final, and binding on the parties and such a finding shall preclude the **Contractor** from commencing a plenary action for any damages relating to the **Contract**. If the **Contractor** protests the determination of the **Commissioner**, the **Contractor** may commence an action in a court of competent jurisdiction of the State of New York under Article 78 of the New York Civil Practice Law and Rules.

ARTICLE 50. QUITTING THE SITE

50.1 Upon receipt of such notice the **Contractor** shall immediately discontinue all further operations under this **Contract** and shall immediately quit the **Site**, leaving untouched all plant, materials, equipment, tools, and supplies then on the **Site**.

ARTICLE 51. COMPLETION OF THE WORK

51.1 The **Commissioner**, after declaring the **Contractor** in default, may then have the **Work** completed by such means and in such manner, by contract with or without public letting, or otherwise, as he/she may deem advisable, utilizing for such purpose such of the **Contractor's** plant, materials, equipment, tools, and supplies remaining on the **Site**, and also such **Subcontractors**, as he/she may deem advisable.

51.2 After such completion, the **Commissioner** shall make a certificate stating the expense incurred in such completion, which shall include the cost of re-letting and also the total amount of liquidated damages (at the rate provided for in the **Contract**) from the date when the **Work** should have been completed by the **Contractor** in accordance with the terms hereof to the date of actual completion of the **Work**. Such certificate shall be binding and conclusive upon the **Contractor**, its sureties, and any person claiming under the **Contractor**, as to the amount thereof.

51.3 The expense of such completion, including any and all related and incidental costs, as so certified by the **Commissioner**, and any liquidated damages assessed against the **Contractor**, shall be charged against and deducted out of monies which are earned by the **Contractor** prior to the date of default. Should the expense of such completion, as certified by the **Commissioner**, exceed the total sum which would have been payable under the **Contract** if it had been completed by the **Contractor**, any excess shall be paid by the **Contractor**.

ARTICLE 52. PARTIAL DEFAULT

52.1 In case the **Commissioner** shall declare the **Contractor** in default as to a part of the **Work** only, the **Contractor** shall discontinue such part, shall continue performing the remainder of the **Work** in strict conformity with the terms of this **Contract**, and shall in no way hinder or interfere with any **Other Contractor(s)** or persons whom the **Commissioner** may engage to complete the **Work** as to which the **Contractor** was declared in default.

52.2 The provisions of this Chapter relating to declaring the **Contractor** in default as to the entire **Work** shall be equally applicable to a declaration of partial default, except that the **Commissioner** 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 performthe **Work**; and

55.1.2 That the facts stated in its bid and the information given by it pursuant to the Information for Bidders is true and correct in all respects; and

55.1.3 That it has read and complied with all requirements set forth in the **Contract**.

ARTICLE 56. CLAIMS AND ACTIONS THEREON

56.1 Any claim, that is not subject to dispute resolution under the **PPB** Rules or this **Contract**, against the **City** for damages for breach of **Contract** shall not be made or asserted in any action, unless the **Contractor** shall have strictly complied with all requirements relating to the giving of notice and of information with respect to such claims, as herein before provided.

56.2 Nor shall any action be instituted or maintained on any such claims unless such action is commenced within six (6) months after **Substantial Completion**; except that:

56.2.1 Any claims arising out of events occurring after **Substantial Completion** and before **Final Acceptance** of the **Work** shall be asserted within six (6) months of **Final Acceptance** of the **Work**;

56.2.2 If the **Commissioner** exercises his/her right to complete or cause to complete any or all unsatisfactory or uncompleted punch list **Work** that remains after the completion date specified in the **Final Approved Punch List** pursuant to Article 54, any such action shall be commenced within six (6) months from the date the **Commissioner** notifies the **Contractor** in writing that he/she has exercised such right. Any claims for monies deducted, retained or withheld under the provisions of this **Contract** shall be assertedwithin six (6) months after the date when such monies otherwise become due and payable hereunder; and

56.2.3 If the **Commissioner** exercises his/her right to terminate the **Contract** pursuant to Article 64, any such action shall be commenced within six (6) months of the date the **Commissioner** exercises said right.

ARTICLE 57. INFRINGEMENT

57.1 The **Contractor** shall be solely responsible for and shall defend, indemnify, and hold the **City** harmless from any and all claims (even if the allegations of the lawsuit are without merit) and judgments for damages and from costs and expenses to which the **City** may be subject to or which it may suffer or incur allegedly arising out of or in connection with any infringement by the **Contractor** of any copyright, trade secrets, trademark or patent rights or any other property or personal right of any third party by the **Contractor** and/or its **Subcontractors** in the performance or completion of the **Work**. Insofar as 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 forthe performance of such **Work**, labor, and services, and the sum so paid pursuant to this **Contract** for such **Work**, labor, and services, shall be in full consideration for the performance by the **Contractor** of all its duties and obligations under this **Contract** in connection with said **Work,** labor, and services.

62.3 20 NYCRR Section 541.3(d) provides that a **Contractor**'s purchases of tangible personal property that is either incorporated into real property owned by a governmental entity or purchased for and sold to a governmental entity are exempt from sales and use tax. The **City** shall not pay sales tax for any such tangible personal property that it purchases from the **Contractor** pursuant to the **Contract.** With respect to such tangible personal property, the **Contractor**, at the request of the **City**, shall furnish to the **City** such bills of sale and other instruments as may be required by the **City**, properly executed, acknowledged and delivered assuring to the **City** title to such tangible personal property, free of liens and/or encumbrances, and the **Contractor** shall mark or otherwise identify all such tangible personal property as the property of the **City**.

62.4 Title to all tangible personal property to be sold by the **Contractor** to the **City** pursuant to the provisions of the **Contract** shall immediately vest in and become the sole property of the **City** upon delivery of such tangible personal property to the **Site**. Notwithstanding such transfer of title, the **Contractor** shall

have the full and continuing responsibility to install such tangible personal property in accordance with the provisions of this **Contract**, protect it, maintain it in a proper condition and forthwith repair, replace and make good any damage thereto, theft or disappearance thereof, and furnish additional tangible personal property in place of any that may be lost, stolen or rendered unusable, without cost to the **City**, until such time as the **Work** covered by the **Contract** is fully accepted by the **City**. Such transfer of title shall in no way affect any of the **Contractor's** obligations hereunder. In the event that, after title has passed to the **City**, any of the tangible personal property is rejected as being defective or otherwise unsatisfactory, title to all such tangible personal property shall be deemed to have been transferred back to the **Contractor**.

62.5 The purchase by **Subcontractors** or **Materialmen** of tangible personal property to be sold hereunder shall be a purchase or procurement for resale to the **Contractor** (either directly or through other **Subcontractors**) and therefore not subject to the aforesaid sales and compensating use taxes, provided that the subcontracts and purchase agreements provide for the resale of such tangible personal property and that such subcontracts and purchase agreements are in a form similar to this **Contract** with respect to the separation of the sale of consumable supplies and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work** from the **Work** and labor, services, and any other matters to be provided, and provided further that the subcontracts and purchase agreements provide separate prices for tangible personal property and all other services and matters. Such separation shall actually be followed in practice, including the separation of payments for tangible personal property from the payments for other **Work** and labor and other things to be provided.

62.6 The **Contractor** and its **Subcontractors** and **Materialmen** shall furnish a **Contractor** Exempt Purchase Certificate to all persons, firms or corporations from which they purchase tangible personal property for the performance of the **Work** covered by this **Contract**.

62.7 In the event any of the provisions of this Article 62 shall be deemed to be in conflict with any other provisions of this **Contract** or create any ambiguity, then the provisions of this Article 62 shall control.

ARTICLE 63. INVESTIGATION(S) CLAUSE

63.1 The parties to this **Contract** agree to cooperate fully and faithfully with any investigation, audit or inquiry conducted by a United States, a State of New York (State) or a **City** governmental agency or authority that is empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath, or conducted by the Inspector General of a governmental agency that is a party in interest to the transaction, submitted bid, submitted proposal, contract, lease, permit or license that is the subject of the investigation, audit or inquiry.

63.2 If any person who has been advised that his/her statement, and any information from such statement, will not be used against him/her in any subsequent criminal proceeding refuses to testify before a grand jury or other governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath concerning the award of or performance under any transaction, agreement, lease, permit, contract, or license entered into with the **City**, the State, or any political subdivision or public authority thereof, or the Port Authority of NewYork and New Jersey, or any local development corporation within the **City**, or any public benefit corporation organized under the **Laws** of the State of New York, or;

63.3 If any person refuses to testify for a reason other than the assertion of his/her privilege against self incrimination in an investigation, audit or inquiry conducted by a **City** or State governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to take testimony under oath, or by the Inspector General of the governmental agency that is a party in interestin, and is

seeking testimony concerning the award of, or performance under any transaction, agreement, lease, permit, contract, or license entered into with the **City**, the State, or any political subdivision thereof or any local development corporation within the **City**, then;

63.4 The **Commissioner** whose **Agency** is a party in interest to the transaction, submitted bid, submitted proposal, contract, lease, permit, or license shall convene a hearing, upon not less than five (5) **Days**' written notice to the parties involved to determine if any penalties should attach for the failure of a person to testify.

63.5 If any non-governmental party to the hearing requests an adjournment, the **Commissioner** who convened the hearing may, upon granting the adjournment, suspend any contract, lease, permit, or license, pending the final determination pursuant to Article 63.7 without the **City** incurring any penalty or damages for delay or otherwise.

63.6 The penalties which may attach after a final determination by the **Commissioner** may include but shall not exceed:

63.6.1 The disqualification for a period not to exceed five (5) years from the date of an adverse determination for any person, or any entity of which such person was a member at the time the testimony was sought, from submitting bids for, or transacting business with, or entering into or obtaining any contract, lease, permit or license with or from the **City**; and/or

63.6.2 The cancellation or termination of any and all such existing **City** contracts, leases, permits or licenses that the refusal to testify concerns and that have not been assigned as permitted under this **Contract**, nor the proceeds of which pledged, to an unaffiliated and unrelated institutional lender for fair value prior to the issuance of the notice scheduling the hearing, without the **City** incurring any penalty or damages on account of such cancellation or termination; monies lawfully due for goods delivered, work done, rentals, or fees accrued prior to the cancellation or termination shall be paid by the **City**.

63.7 The **Commissioner** shall consider and address in reaching his/her determination and inassessing an appropriate penalty the factors in Articles 63.7.1 and 63.7.2. The **Commissioner** may also consider, if relevant and appropriate, the criteria established in Articles 63.7.3 and 63.7.4, in addition to any other information which may be relevant and appropriate:

63.7.1 The party's good faith endeavors or lack thereof to cooperate fully and faithfully with any governmental investigation or audit, including but not limited to the discipline, discharge, or disassociation of any person failing to testify, the production of accurate and complete books and records, and the forthcoming testimony of all other members, agents, assignees or fiduciaries whose testimony is sought.

63.7.2 The relationship of the person who refused to testify to any entity that is a party tothe hearing, including but not limited to, whether the person whose testimony is sought has an ownership interest in the entity and/or the degree of authority and responsibility theperson has within the entity.

63.7.3 The nexus of the testimony sought to the subject entity and its contracts, leases, permits or licenses with the **City**.

63.7.4 The effect a penalty may have on an unaffiliated and unrelated party or entity thathas a significant interest in an entity subject to penalties under Article 63.6, provided that the party

or entity has given actual notice to the **Commissioner** upon the acquisition of the interest, or at the hearing called for in Article 63.4, gives notice and proves that such interest was previously acquired. Under either circumstance the party or entity shall present evidence at the hearing demonstrating the potential adverse impact a penalty will have on such person or entity.

63.8 Definitions:

63.8.1 The term "license" or "permit" as used in this Article 63 shall be defined as a license, permit, franchise or concession not granted as a matter of right.

63.8.2 The term "person" as used in this Article 63 shall be defined as any natural person doing business alone or associated with another person or entity as a partner, director, officer, principal or employee.

63.8.3 The term "entity" as used in this Article 63 shall be defined as any firm, partnership, corporation, association, joint venture, or person that receives monies, benefits, licenses, leases, or permits from or through the **City** or otherwise transacts business with the **City**.

63.8.4 The term "member" as used in this Article 63 shall be defined as any person associated with another person or entity as a partner, director, officer, principal or employee.

63.9 In addition to and notwithstanding any other provision of this **Contract**, the **Commissioner** may in his/her sole discretion terminate this **Contract** upon not less than three (3) **Days'** written notice in the event the **Contractor** fails to promptly report in writing to the **Commissioner** of the Department of Investigations ("DOI") of the **City** any solicitation of money, goods, requests for future employment or other benefit or thing of value, by or on behalf of any employee of the **City** or other person, firm, corporation or entity for any purpose which may be related to the procurement or obtaining of this **Contract** by the **Contractor**, or affecting the performance of this **Contract**.

ARTICLE 64. TERMINATION BY THE CITY

64.1 In addition to termination pursuant to any other article of this **Contract**, the **Commissioner** may, at any time, terminate this **Contract** by written notice to the **Contractor**. In the event of termination, the **Contractor** shall, upon receipt of such notice, unless otherwise directed by the **Commissioner**:

64.1.1 Stop **Work** on the date specified in the notice;

64.1.2 Take such action as may be necessary for the protection and preservation of the **City's** materials and property;

64.1.3 Cancel all cancelable orders for material and equipment;

64.1.4 Assign to the **City** and deliver to the **Site** or another location designated by the **Commissioner**, any non-cancelable orders for material and equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract** and not incorporated in the **Work**;

64.1.5 Take no action which will increase the amounts payable by the **City** under this
64.1.5 **Contract**.

64.2 In the event of termination by the **City** pursuant to this Article 64, payment to the **Contractor** shall be in accordance with Articles 64.2.1, 64.2.2 or 64.2.3, to the extent that each respective article applies.

64.2.1 Lump Sum Contracts or Items: On all lump sum **Contracts**, or on lump sum items in a **Contract**, the **City** will pay the **Contractor** the sum of the amounts described in Articles 64.2.1(a) and 64.2.1(b), less all payments previously made pursuant to this **Contract**. On lump sum **Contracts** only, the **City** will also pay the **Contractor** an additional sum as provided in Article 64.2.1(c).

64.2.1(a) For **Work** completed prior to the notice of termination, the **Contractor** shall be paid a pro rata portion of the lump sum bid amount, plus approved change orders, based upon the percent completion of the **Work**, as determined by the **Commissioner**. For the purpose of determining the pro rata portion of the lump sum bid amount to which the **Contractor** is entitled, the bid breakdown submitted in accordance with Article 41 shall be considered, but shall not be dispositive. The **Commissioner's** determination hereunder shall be final, binding, and conclusive.

64.2.1(b) For non-cancelable material and equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract**, but not yet incorporated in the **Work**, the **Contractor** shall be paid the lesser of the following, less salvage value:

64.2.1(b)(i) The Direct Cost, as defined in Article 64.2.4; or

64.2.1(b)(ii) The fair and reasonable value, if less than Direct Cost, of such material and equipment, plus necessary and reasonable delivery costs.

64.2.1(b)(iii) In addition, the **Contractor** shall be paid five (5%) percent of the amount described in Article 64.2.1(b)(i) or Article 64.2.1(b)(ii), whichever applies.

64.2.1(c) Except as otherwise provided in Article 64.2.1(d), on all lump sum **Contracts**, the **Contractor** shall be paid the percentage indicated below applied tothe difference between the total lump sum bid amount and the total of all payments made prior to the notice of termination plus all payments allowed pursuant to Articles 64.2.1(a) and 64.2.1(b):

64.2.1(c)(i) Five (5%) percent of the first five million ($5,000,000) dollars; and

64.2.1(c)(ii) Three (3%) percent of any amount between five million ($5,000,000) dollars and fifteen million ($15,000,000) dollars; plus

64.2.1(c)(iii) One (1%) percent of any amount over fifteen million ($15,000,000) dollars.

64.2.1(d) In the event the **City** terminates a lump sum **Contract** pursuant to this Article 64 within ninety (90) **Days** after registration of the **Contract** with the **Comptroller**, the **Contractor** shall be paid one (1%) percent of the difference between the lump sum bid amount and the total of all payments made pursuant to this Article 64.2.

64.2.2 Unit Price Contracts or Items: On all unit price **Contracts**, or on unit price items ina

Contract, the **City** will pay the **Contractor** the sum of the amounts described in Articles 64.2.2(a) and 64.2.2(b), less all payments previously made pursuant to this **Contract**:

64.2.2(a) For all completed units, the unit price stated in the **Contract**, and

64.2.2(b) For units that have been ordered but are only partially completed, the **Contractor** will be paid:

64.2.2(b)(i) A pro rata portion of the unit price stated in the **Contract** based upon the percent completion of the unit and

64.2.2(b)(ii) For non-cancelable material and equipment, payment willbe made pursuant to Article 64.2.1(b).

64.2.3 Time and Materials Contracts or Items Based on Time and Material Records: On all **Contracts** or items in a **Contract** where payment for the **Work** is based on time and material records, the **Contractor** shall be paid in accordance with Article 26, less all payments previously made pursuant to this **Contract**.

64.2.4 Direct Costs: Direct Costs as used in this Article 64.2 shall mean:

64.2.4(a) The actual purchase price of material and equipment, plus necessary and reasonable delivery costs,

64.2.4(b) The actual cost of labor involved in construction and installation at the **Site**, and

64.2.4(c) The actual cost of necessary bonds and insurance purchased pursuant to requirements of this **Contract** less any amounts that have been or should be refunded by the **Contractor's** sureties or insurance carriers.

64.2.4(d) Direct Costs shall not include overhead.

64.3 In no event shall any payments under this Article 64 exceed the **Contract** price for such items.

64.4 All payments pursuant to Article 64 shall be in the nature of liquidated damages and shall be accepted by the **Contractor** in full satisfaction of all claims against the **City**.

64.5 The **City** may deduct or set off against any sums due and payable pursuant to this Article 64, any deductions authorized by this **Contract** or by **Law** (including but not limited to liquidated damages) and any claims it may have against the **Contractor**. The **City's** exercise of the right to terminate the **Contract** pursuant to this Article 64 shall not impair or otherwise effect the **City's** right to assert any claims it may have against the **Contractor** in a plenary action.

64.6 Where the **Work** covered by the **Contract** has been substantially completed, as determined in writing by the **Commissioner**, termination of the **Work** shall be handled as an omission of **Work** pursuant to Articles 29 and 33, in which case a change order will be issued to reflect an appropriate reduction in the **Contract** sum, or if the amount is determined after final payment, such amount shall be paid by the **Contractor**.

ARTICLE 65. CHOICE OF LAW, CONSENT TO JURISDICTION AND VENUE

65.1 This **Contract** shall be deemed to be executed in the **City** regardless of the domicile of the **Contractor**, and shall be governed by and construed in accordance with the **Laws** of the State of New York and the **Laws** of the United States, where applicable.

65.2 The parties agree that any and all claims asserted against the **City** arising under this **Contract** or related thereto shall be heard and determined in the courts of the State of New York ("New York State Courts") located in the **City** and County of New York. To effect this **Contract** and intent, the **Contractor** agrees:

65.2.1 If the **City** initiates any action against the **Contractor** in Federal court or in a New York State Court, service of process may be made on the **Contractor** either in person, wherever such **Contractor** may be found, or by registered mail addressed to the **Contractor** at its address as set forth in this **Contract**, or to such other address as the **Contractor** may provide to the **City** in writing; and

65.2.2 With respect to any action between the **City** and the **Contractor** in a New York State Court, the **Contractor** hereby expressly waives and relinquishes any rights it might otherwise have:

65.2.2(a) To move to dismiss on grounds of forum non conveniens;

65.2.2(b) To remove to Federal Court; and

65.2.2(c) To move for a change of venue to a New York State Court outside New York County.

65.2.3 With respect to any action brought by the **City** against the **Contractor** in a Federal Court located in the **City**, the **Contractor** expressly waives and relinquishes any right it might otherwise have to move to transfer the action to a Federal Court outside the **City**.

65.2.4 If the **Contractor** commences any action against the **City** in a court located other than in the **City** and County of New York, upon request of the **City**, the **Contractor** shall either consent to a transfer of the action to a New York State Court of competent jurisdiction located in the **City** and County of New York or, if the Court where the action is initially brought will not or cannot transfer the action, the **Contractor** shall consent to dismiss such action without prejudice and may thereafter reinstate the action in a New York State Court of competent jurisdiction in New York County.

65.3 If any provision(s) of this Article 65 is held unenforceable for any reason, each and all other provision(s) shall nevertheless remain in full force and effect.

ARTICLE 66. PARTICIPATION IN AN INTERNATIONAL BOYCOTT

66.1 The **Contractor** agrees that neither the **Contractor** nor any substantially owned affiliated company is participating or shall participate in an international boycott in violation of the provisions ofthe Federal Export Administration Act of 1979, as amended, or the regulations of the United States Department of Commerce (Commerce Department) promulgated thereunder.

66.2 Upon the final determination by the Commerce Department or any other agency of the United States as to, or conviction of the **Contractor** or a substantially-owned affiliated company thereof for participation in an international boycott in violation of the provisions of the Export Administration Act of 1979, as amended, or the regulations promulgated thereunder, the **Comptroller** may, at his/her option, render forfeit and void this **Contract**.

66.3 The **Contractor** shall comply in all respects, with the provisions of Section 6-114 of the Administrative Code and the rules and regulations issued by the **Comptroller** thereunder.

ARTICLE 67. LOCALLY BASED ENTERPRISE PROGRAM

67.1 This **Contract** is subject to the requirements of Section 6-108.1 of the Administrative Code and regulations promulgated thereunder. No construction contract shall be awarded unless and until these requirements have been complied with in their entirety; however, compliance with this Article 67 is not required if the Agency sets Subcontractor Participation Goals for Minority- and Women-Owned Business Enterprises (M/WBEs).

67.2 Unless specifically waived by the **Commissioner** with the approval of the Division of Economic and Financial Opportunity of the **City** Department of Business Services, if any portion of the **Contract** is subcontracted, not less than ten (10%) percent of the total dollar amount of the **Contract** shall be awarded to locally based enterprises (LBEs); except that where less than ten (10%) percent of the total dollar amount of the **Contract** is subcontracted, such lesser percentage shall be so awarded.

67.3 The **Contractor** shall not require performance and payment bonds from LBE **Subcontractors**.

67.4 If the **Contractor** has indicated prior to award that no **Work** will be subcontracted, no **Work** shall be subcontracted without the prior approval of the **Commissioner**, which shall be granted only 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 contraction of comparable quality, the **Agency** shall refer such bids to the Mayor, the Speaker or other officials, as appropriate, who may determine, in accordance with applicable **Law**, that it is in the best interest of the **City** that the **Contract** be awarded to other than the lowest responsible pursuant to Section 313(b)(2) of the **City** Charter.

69.1.4 In the case of **Contracts** let by other than competitive sealed bidding, if a prospective **Contractor** does not agree to these conditions, no **Agency**, elected official or the **City** Council shall award the **Contract** to that bidder unless the **Agency** seeking to use the goods, services or construction certifies in writing that the **Contract** is necessary for the **Agency** to perform its functions and there is no other responsible **Contractor** who will supply goods, services or construction of comparable quality at a comparable price.

69.2 In accordance with Section 6-115.1 of the Administrative Code, the **Contractor** stipulates that such **Contractor** and any individual or legal entity in which the **Contractor** holds a ten (10%) percent or greater ownership interest in the **Contractor** either:

69.2.1 Have no business operations in Northern Ireland, or

69.2.2 Shall take lawful steps in good faith to conduct any business operations they have in

Northern Ireland in accordance with the MacBride Principles, and shall permit independent monitoring of their compliance with such principles.

69.3 For purposes of this Article, the following terms shall have the following meanings:

69.3.1 "MacBride Principles" shall mean those principles relating to nondiscrimination in employment and freedom of work-place opportunity which require employers doing business in Northern Ireland to:

69.3.1(a) increase the representation of individuals from under-represented religious groups in the workforce, including managerial, supervisory, administrative, clerical and technical jobs;

69.3.1(b) take steps to promote adequate security for the protection of employees from under-represented religious groups both at the work-place and while traveling toand from **Work**;

69.3.1(c) ban provocative religious or political emblems from the workplace;

69.3.1(d) publicly advertise all job openings and make special recruitment efforts to attract applicants from under-represented religious groups;

69.3.1(e) establish layoff, recall, and termination procedures which do not in practice favor a particular religious group;

69.3.1(f) abolish all job reservations, apprenticeship restrictions and different employment criteria which discriminate on the basis of religion;

69.3.1(g) develop training programs that will prepare substantial numbers of current employees from under-represented religious groups for skilled jobs, including the expansion of existing programs and the creation of new programs to train, upgrade, and improve the skills of workers from under-represented religious groups;

69.3.1(h) establish procedures to asses, identify, and actively recruit employees from under-represented religious groups with potential for further advancement; and

69.3.1(i) appoint a senior management staff member to oversee affirmative actionefforts and develop a timetable to ensure their full implementation.

69.4 The **Contractor** agrees that the covenants and representations in Article 69.2 are material conditions to this **Contract**. In the event the **Agency** receives information that the **Contractor** who made the stipulation required by this Article 69 is in violation thereof, the **Agency** shall review such information and give the **Contractor** an opportunity to respond. If the **Agency** finds that a violation has occurred, the **Agency** shall have the right to declare the **Contractor** in default in default and/or terminate this **Contract** for cause and procure supplies, services or **Work** from another source in the manner the **Agency** deems proper. In the event of such termination, the **Contractor** shall pay to the **Agency**, or the **Agency** in its sole discretion may withhold from any amounts otherwise payable to the **Contractor**, the difference between the **Contract** price for the uncompleted portion of this **Contract** and the cost to the **Agency** of completing performance of this **Contract** either itself or by engaging another **Contractor** or **Contractors**. In the case of a requirement **Contract**, the **Contractor** shall be liable for such difference in price for the entire amount of supplies required by the **Agency** for the uncompleted term of **Contractor's Contract**. In the case of a construction **Contract**, the **Agency** shall also have the right to hold the **Contractor** in partial or total default in

accordance with the default provisions of this **Contract**, and/or may seek debarment or suspension of the **Contractor**. The rights and remedies of the **Agency** hereunder shall be in addition to, and not in lieu of, any rights and remedies the **Agency** has pursuant to this **Contract** or by operation of **Law**.

ARTICLE 70. ELECTRONIC FILING/NYC DEVELOPMENT HUB

70.1 The **Contractor** shall electronically file all alteration type-2 and alteration type-3 applications via the New York City Development Hub Web site, except applications for the following types of minor alterations: enlargements, curb cuts, legalizations, fire alarms, builders pavement plans, and jobs filed on Landmark Preservation Commission calendared properties. All such filings must be professionally certified. Information about electronic filing via the New York City Development Hub is available on the **City** Department of Buildings Web site at www.nyc.gov/buildings.

ARTICLE 71. PROHIBITION OF TROPICAL HARDWOODS

71.1 Tropical hardwoods, as defined in Section 165 of the New York State Finance Law (Finance Law), shall not be utilized in the performance of this **Contract** except as expressly permitted by Section 165 of the Finance Law.

ARTICLE 72. CONFLICTS OF INTEREST

72.1 Section 2604 of the **City** Charter and other related provisions of the **City** Charter, the Administrative Code, and the Penal Law are applicable under the terms of this **Contract** in relation to conflicts of interest and shall be extended to **Subcontractors** authorized to perform **Work**, labor and services pursuant to this **Contract** and further, it shall be the duty and responsibility of the **Contractor** to so inform its respective **Subcontractors**. Notice is hereby given that, under certain circumstances, penalties may be invoked against the donor as well as the recipient of any form of valuable gift.

ARTICLE 73. MERGER CLAUSE

73.1 The written **Contract** herein, contains all the terms and conditions agreed upon by the parties hereto, and no other agreement, oral or otherwise, regarding the subject matter of this **Contract** shall be deemed to exist or to bind any of the parties hereto, or to vary any of the terms contained herein.

ARTICLE 74. STATEMENT OF WORK

74.1 The **Contractor** shall furnish all labor and materials and perform all **Work** in strictaccordance with the **Specifications** and **Addenda** thereto, numbered as shown in Schedule A.

ARTICLE 75. COMPENSATION TO BE PAID TO CONTRACTOR

75.1 The **City** will pay and the **Contractor** will accept in full consideration for the performance of the **Contract**, subject to additions and deductions as provided herein, the total sum shown in Schedule A, this said sum being the amount at which the **Contract** was awarded to the **Contractor** at a public letting thereof, based upon the **Contractor's** bid for the **Contract**.

ARTICLE 76. ELECTRONIC FUNDS TRANSFER

76.1 In accordance with Section 6-107.1 of the Administrative Code, the **Contractor** agrees to accept payments under this **Contract** from the **City** by electronic funds transfer (EFT). An EFT is any transfer of funds, other than a transaction originated by check, draft or similar paper instrument, which is initiated through an electronic terminal, telephonic instrument or computer or magnetic tape so as to order, instruct or authorize a financial institution to debit or credit an account. Prior to the first payment made under this **Contract**, the **Contractor** shall designate one financial institution or other authorized payment agent and shall complete the attached "EFT Vendor Payment Enrollment Form" in order to provide the Commissioner of the **City** Department of Finance with information necessary for the **Contractor** to receive electronic funds transfer payments through a designated financial institution or authorized payment agent. The crediting of the amount of a payment to the appropriate account on the books of a financial institution or other authorized payment agent designated by the **Contractor** shall constitute full satisfaction by the **City** for the amount of the payment under this **Contract**. The account information supplied by the **Contractor** to facilitate the electronic funds transfer shall remain confidential to the fullest extent provided by **Law**.

76.2 The **Commissioner** may waive the application of the requirements of this Article 76 to payments on contracts entered into pursuant to Section 315 of the **City** Charter. In addition, the Commissioner of the Department of Finance and the Comptroller may jointly issue standards pursuant to which the **Agency** may waive the requirements of this Article 76 for payments in the following circumstances: (i) for individuals or classes of individuals for whom compliance imposes a hardship; (ii) for classifications or types of checks; or (iii) in other circumstances as may be necessary in the interest of the **City**.

ARTICLE 77. RECORDS RETENTION

77.1 The **Contractor** agrees to retain all books, records, and other documents relevant to this **Contract** for six years after the final payment or termination of this **Contract**, whichever is later. **City**, state, and federal auditors and any other persons duly authorized by the **City** shall have full access to and the right to examine any such books, records, and other documents during the retention period.

ARTICLE 78. EXAMINATION AND VIEWING OF SITE, CONSIDERATION OF OTHER SOURCES OF INFORMATION AND CHANGED SITE CONDITIONS

78.1 Pre-Bidding (Investigation) Viewing of Site – Bidders must carefully view and examine the **Site** of the proposed **Work**, as well as its adjacent area, and seek other usual sources of information, for they will be conclusively presumed to have full knowledge of any and all conditions and hazards on, about or above the **Site** relating to or affecting in any way the performance of the **Work** to be done under the **Contract** that were or should have been known by a reasonably prudent bidder. To arrange a date for visiting the **Site**,

bidders are to contact the **Agency** contact person specified in the bid documents.

78.2 Should the **Contractor** encounter during the progress of the Work site conditions or environmental hazards at the **Site** materially differing from any shown on the **Contract Drawings** or indicated in the **Specifications** or such conditions or environmental hazards as could not reasonablyhave been anticipated by the **Contractor**, which conditions or hazards will materially affect the cost of the **Work** to be done under the **Contract**, the attention of the **Commissioner** must be called immediately to such conditions or hazards before they are disturbed. The **Commissioner** shall thereupon promptly investigate the conditions or hazards. If the **Commissioner** finds that they do so materially differ, and that they could not have been reasonably anticipated by the **Contractor**, the **Contract** may be modified with the **Commissioner**'s written approval.

ARTICLE 79. PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED BUSINESS ENTERPRISES IN CITY PROCUREMENT

ARTICLE I. M/WBE PROGRAM

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

If this Contract is subject to the M/WBE Program established by Section 6-129, the specific requirements of MBE and/or WBE participation for this Contract are set forth in Schedule B of the Contract (entitled the "M/WBE Utilization Plan") and are detailed below.

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

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

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

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

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

PART A: PARTICIPATION GOALS FOR CONSTRUCTION, STANDARD AND PROFESSIONAL SERVICES CONTRACTS OR TASK ORDERS

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

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

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

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

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

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

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

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

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

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

6. MBE and WBE firms must be certified by DSBS in order for the Contractor to credit such firms' participation toward the attainment of the Participation Goals. Such certification must occur prior to the firms' commencement of work. A list of city-certified MBE and WBE firms may be obtained from the DSBS website at www.nyc.gov/buycertified, by emailing DSBS at buyer@sbs.nyc.gov, by calling (212) 513-6451, or by visiting or writing DSBS at One Liberty Plaza ., New York, New York, 10006, 11th floor. Eligible firms that have not yet

been certified may contact DSBS in order to seek certification by visiting www.nyc.gov/getcertified, emailing MWBE@sbs.nyc.gov, or calling the DSBS certification helpline at (212) 513-6311. A firm that is certified as both an MBE and a WBE may be counted either toward the goal for MBEs or the goal for WBEs, but not both. No credit shall be given for participation by a graduate MBE or graduate WBE, as defined in Section 6-129(c)(20).

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

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

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

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

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

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

(d) Agency may grant a full or partial waiver of the Participation Goals to a bidder, proposer or contractor, as applicable, who demonstrates—before submission of the bid, proposal or Task Order, as applicable—that it has legitimate business reasons for proposing the level of subcontracting in its M/WBE Utilization Plan. In making its determination, Agency shall consider factors that shall include, but not be limited

to, whether the bidder, proposer or contractor, as applicable, has the capacity and the bona fide intention to perform the Contract without any subcontracting, or to perform the Contract without awarding the amount of subcontracts represented by the Participation Goals. In making such determination, Agency may consider whether the M/WBE Utilization Plan is consistent with past subcontracting practices of the bidder, proposer or contractor, as applicable, whether the bidder, proposer or contractor, as applicable, has made efforts to form a joint venture with a certified firm, and whether the bidder, proposer, or contractor, as applicable, has made good faith efforts to identify other portions of the Contract that it intends to subcontract.

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

(i) The Contractor advertised opportunities to participate in the Contract, where appropriate, in general circulation media, trade and professional association publications and small business media, and publications of minority and women's business organizations;
(ii) The Contractor provided notice of specific opportunities to participate in the Contract, in a timely manner, to minority and women's business organizations;
(iii) The Contractor sent written notices, by certified mail or facsimile, in a timely manner, to advise MBEs or WBEs that their interest in the Contract was solicited;
(iv) The Contractor made efforts to identify portions of the work that could be substituted for portions originally designated for participation by MBEs and/or WBEs in the M/WBE Utilization Plan, and for which the Contractor claims an inability to retain MBEs or WBEs;
(v) The Contractor held meetings with MBEs and/or WBEs prior to the date their bids or proposals were due, for the purpose of explaining in detail the scope and requirements of the work for which their bids or proposals were solicited;
(vi) The Contractor made efforts to negotiate with MBEs and/or WBEs as relevant to perform specific subcontracts, or act as suppliers or service providers;
(vii) Timely written requests for assistance made by the Contractor to Agency's M/WBE liaison officer and to DSBS;
(viii) Description of how recommendations made by DSBS and Agency were acted upon and an explanation of why action upon such recommendations did not lead to the desired level of participation of MBEs and/or WBEs.

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

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

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

efforts listed in Section 11(a) above, as applicable, along with any other relevant factors.

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

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

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

PART B: MISCELLANEOUS

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

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

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

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

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

ARTICLE II. ENFORCEMENT

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

2. Whenever Agency believes that the Contractor or a subcontractor is not in compliance with Section 6-129

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

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

(a) entering into an agreement with the Contractor allowing the Contractor to cure the violation;
(b) revoking the Contractor's pre-qualification to bid or make proposals for future contracts;
(c) making a finding that the Contractor is in default of the Contract;
(d) terminating the Contract;
(e) declaring the Contractor to be in breach of Contract;
(f) withholding payment or reimbursement;
(g) determining not to renew the Contract;
(h) assessing actual and consequential damages;
(i) assessing liquidated damages or reducing fees, provided that liquidated damages may be based on amounts representing costs of delays in carrying out the purposes of the M/WBE Program, or in meeting the purposes of the Contract, the costs of meeting utilization goals through additional procurements, the administrative costs of investigation and enforcement, or other factors set forth in the Contract;
(j) exercising rights under the Contract to procure goods, services or construction from another contractor and charge the cost of such contract to the Contractor that has been found to be in noncompliance; or
(k) taking any other appropriate remedy.

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

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

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

7. The Contractor's record in implementing its M/WBE Utilization Plan shall be a factor in the evaluation of

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

PERFORMANCE BOND #2

Performance Bond #2 (4 pages): Use if the total contract price is more than $5 Million.

Bond No: EACX4040925

PERFORMANCE BOND #2 (Page 1)

PERFORMANCE BOND #2KNOW ALL PERSONS BY THESE PRESENTS:,

That we, Zaman Construction Corp.

97-53 85th Street

Ozone Park, NY 11416

hereinafter referred to as the "Principal,"
and, Endurance Assurance Corporation

4 Manhattanville Road

Purchase, NY 10577

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

Ten Million Seven Hundred Twenty Six Thousand Three Hundred Sixty Two Dollars and Zero Cents

($ 10,726,362.00) 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

Fort Washington Armory Roof Replacement/ HVAC Upgrade- 85025B0074-HH112FTRF

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth infull;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the Cityfrom all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making

good any such default and shall protect the said City of New York against, and pay any and all amounts,damages, cost and judgments which may or shall be recovered against said City or its officers or agents orwhich the said City of New York may be called upon to pay any person or corporation by reason of anydamages arising or growing out of the Principal's default of the Contract, then this obligation shall be nulland void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the Citythat the City has determined that the Principal is in default of the Contract, to either (1) pay the full amount of the above penal sum in complete discharge and exoneration of this bond and of all the liabilities of the Surety relating to this bond, or (2) fully perform and complete the Work to be performed under theContract, pursuant to the terms, conditions, and covenants thereof. The Surety (Sureties) further agrees, at its option, either to tender the penal sum or to commence and diligently perform the Work specified in the Contract, including physical site work, within twenty-five (25) business days after written notice thereoffrom the City and to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. The Surety and the City reserveall rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to commence and to complete all Work as provided herein.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected byany extension of time, modification, omission, addition, or change in or to the said Contract or the Workto be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any Work to be performed or any moneys due or to become due thereunder; and said Surety (Sureties) does 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 andall things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal.

IN WITNESS WHEREOF, The Principal and the Surety (Sureties) have hereunto set their hands and seals,and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this

05 day of January 20 26.

(Seal)

Zaman Construction Corp. (L.S.)
Principal

(Seal)

By: _____

Surety Endurance Assurance Corporation

By: _____.
Pamela Lipkin-Sauertig, Attorney-in-Fact
(Seal) Surety

By: _____.
(Seal) Surety

By: _____.
(Seal) Surety

By: _____.
(Seal) Surety

By: _____.

Bond Premium Rate 28.75, 23.00,17.25,13.80,12.65, 11.50.

Bond Premium Cost 149,803.16.

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

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

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

ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION

State of NY County of Queens ss:

On this 5 day of 01, 20 26 before me personally came JAHID MINTO

to me known, who, being by me duly sworn did depose and say that he resides at 967 Lehama St. Brooklyn; that he/she is the President of the corporation described in and which executed the foregoing instrument; that he/she signed his/her name to the foregoing instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

MD A RAHMAN
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01RA6318032
Qualified in Queens County
Commission Expires 01/20/2027

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.

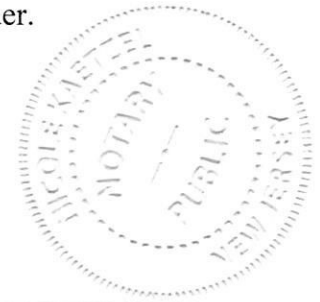
* * * * * * * *

Affix Acknowledgments and Justification of Sureties.

SURETY ACKNOWLEDGEMENT

State of **New Jersey**
SS:
County of **Morris**

On this **5th** day of **January , 2026,** before me personally comes **Pamela Lipkin-Sauertig** to me known, who, being by me duly sworn, deposes and says that she is the Attorney-In-Fact of the **Endurance Assurance Corporation** the Corporation described in and which executed the foregoing instrument; that she knows that seal of said Corporation; that the seal affixed to the said instrument is such Corporate seal; that it was so affixed by the order of the Board of Directors of the said Corporation, and that she signed her name thereto by like order.



(Signature and Title of Official Taking Acknowledgement)

Nicole Kaetzel
NOTARY PUBLIC
STATE OF NEW JERSEY
MY COMMISSION EXPIRES APRIL 9, 2030
COMMISSION: #50125852

SOMPO INTERNATIONAL
INSURANCE

POWER OF ATTORNEY

11921

KNOW ALL BY THESE PRESENTS, that **Endurance Assurance Corporation**, a Delaware corporation, **Endurance American Insurance Company**, a Delaware corporation, **Lexon Insurance Company**, a Texas corporation, and/or **Bond Safeguard Insurance Company**, a South Dakota corporation, each, a "Company" and collectively, "**Sompo International**," do hereby constitute and appoint: **Pamela Lipkin-Sauertig, Robyn Rost** as true and lawful Attorney(s)-In-Fact to make, execute, seal, and deliver for, and on its behalf as surety or co-surety; bonds and undertakings given for any and all purposes, also to execute and deliver on its behalf as aforesaid renewals, extensions, agreements, waivers, consents or stipulations relating to such bonds or undertakings provided, however, that no single bond or undertaking so made, executed and delivered shall obligate the Company for any portion of the penal sum thereof in excess of the sum of **ONE HUNDRED MILLION Dollars ($100,000,000.00).**

Such bonds and undertakings for said purposes, when duly executed by said attorney(s)-in-fact, shall be binding upon the Company as fully and to the same extent as if signed by the President of the Company under its corporate seal attested by its Corporate Secretary.

This appointment is made under and by authority of certain resolutions adopted by the sole shareholder of each Company by unanimous written consent effective the 15th day of June, 2019, a copy of which appears below under the heading entitled "Certificate".

This Power of Attorney is signed and sealed by facsimile under and by authority of the following resolution adopted by the sole shareholder of each Company by unanimous written consent effective the 15th day of June, 2019 and said resolution has not since been revoked, amended or repealed:

RESOLVED, that the signature of an individual named above and the seal of the Company may be affixed to any such power of attorney or any certificate relating thereto by facsimile, and any such power of attorney or certificate bearing such facsimile signature or seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN WITNESS WHEREOF, each Company has caused this instrument to be signed by the following officers, and its corporate seal to be affixed this 15th day of June, 2019.

Endurance Assurance Corporation
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Endurance American Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Lexon Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Bond Safeguard Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

ACKNOWLEDGEMENT

On this 15th day of June, 2019, before me, personally came the above signatories known to me, who being duly sworn, did depose and say that he/they is an officer of each of the Companies; and that he executed said instrument on behalf of each Company by authority of his office under the by-laws of each Company.

By: Amy Taylor
Amy Taylor, Notary Public – My Commission Expires 3/9/27

CERTIFICATE

I, the undersigned Officer of each Company, DO HEREBY CERTIFY that:

1. That the original power of attorney of which the foregoing is a copy was duly executed on behalf of each Company and has not since been revoked, amended or modified; that the undersigned has compared the foregoing copy thereof with the original power of attorney, and that the same is a true and correct copy of the original power of attorney and of the whole thereof;
2. The following are resolutions which were adopted by the sole shareholder of each Company by unanimous written consent effective June 15, 2019 and said resolutions have not since been revoked, amended or modified:

   "RESOLVED, that each of the individuals named below is authorized to make, execute, seal and deliver for and on behalf of the Company any and all bonds, undertakings or obligations in surety or co-surety with others: RICHARD M. APPEL, BRIAN J. BEGGS, CHRISTOPHER DONELAN, SHARON L. SIMS, CHRISTOPHER L. SPARRO, MARIANNE L. WILBERT

   ; and be it further

   RESOLVED, that each of the individuals named above is authorized to appoint attorneys-in-fact for the purpose of making, executing, sealing and delivering bonds, undertakings or obligations in surety or co-surety for and on behalf of the Company."
3. The undersigned further certifies that the above resolutions are true and correct copies of the resolutions as so recorded and of the whole thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal this 05 day of January, 20 26.

By:
Daniel S. Lurie, Secretary

NOTICE: U. S. TREASURY DEPARTMENT'S OFFICE OF FOREIGN ASSETS CONTROL (OFAC)

No coverage is provided by this Notice nor can it be construed to replace any provisions of any surety bond or other surety coverage provided. This Notice provides information concerning possible impact on your surety coverage due to directives issued by OFAC. **Please read this Notice carefully.**

The Office of Foreign Assets Control (OFAC) administers and enforces sanctions policy, based on Presidential declarations of "national emergency". OFAC has identified and listed numerous foreign agents, front organizations, terrorists, terrorist organizations, and narcotics traffickers as "Specially Designated Nationals and Blocked Persons". This list can be located on the United States Treasury's website – https://www.treasury.gov/resource-center/sanctions/SDN-List.

In accordance with OFAC regulations, if it is determined that you or any other person or entity claiming the benefits of any coverage has violated U.S. sanctions law or is a Specially Designated National and Blocked Person, as identified by OFAC, any coverage will be considered a blocked or frozen contract and all provisions of any coverage provided are immediately subject to OFAC. When a surety bond or other form of surety coverage is considered to be such a blocked or frozen contract, no payments nor premium refunds may be made without authorization from OFAC. Other limitations on the premiums and payments may also apply.

Any reproductions are void.

Surety Claims Submission: LexonClaimAdministration@sompo-intl.com
Telephone: 615-553-9500 Mailing Address: Sompo International; 12890 Lebanon Road; Mount Juliet, TN 37122-2870

ENDURANCE ASSURANCE CORPORATION
Balance Sheet - Statutory - Basis
December 31, 2024

Assets:	
Bonds	$ 9,575,738,600
Preferred stocks	15,965,244
Common stocks	2,974,058,744
Cash, cash equivalents, and short-term investments	380,926,489
Other invested assets	382,161,094
Receivables for securities	7,743,789
Total cash and invested assets	**13,336,593,960**
Agents' balances or uncollected premiums	3,751,103,321
Reinsurance recoverable on loss and loss adjustment expense payments	1,079,426,776
Funds held by or deposited with reinsured companies	146,694,256
Investment income due and accrued	75,551,122
Current federal and foreign income tax recoverable and interest thereon	9,551,514
Net deferred tax asset	201,158,214
Receivables from parent, subsidiaries and affiliates	38,811,391
Other assets	396,387,073
Total admitted assets	$ **19,035,277,627**
Liabilities:	
Loss and loss adjustment expenses	$ 7,434,113,469
Reinsurance payable on paid loss and loss adjustment expenses	797,536,780
Commissions payable, contingent commissions and other similar charges	7,067,852
Other expenses	26,564,195
Taxes, licenses and fees (excluding federal and foreign income taxes)	18,927,896
Unearned premiums	2,959,915,954
Advanced premium	9,091,368
Dividends declared and unpaid (stockholders)	430,000,000
Ceded reinsurance premiums payable	1,659,311,317
Funds held by company under reinsurance treaties	155,788,157
Amounts withheld or retained by company for account of others	702,732,322
Remittances and items not allocated	186,045,368
Provision for reinsurance	26,000,766
Payable to parent, subsidiaries and affiliates	234,928,735
Payable for securities	48,893,701
Other liabilities	57,059,433
Total liabilities	**14,753,977,313**
Capital and surplus:	
Common capital stock	5,000,000
Gross paid in and contributed surplus	3,480,137,280
Unassigned funds (surplus)	794,870,512
Aggregate write-ins for special surplus funds	1,292,522
Total capital and surplus	**4,281,300,314**
Total liabilities and capital and surplus	$ **19,035,277,627**

I, John P. Miller, Vice President of Endurance Services Limited (the "Company") do hereby certify that to the best of my knowledge and belief, the foregoing is a full and true Statutory Statement of Admitted Assets, Liabilities, Capital and Surplus of the Endurance Assurance Corporation as of December 31, 2024 prepared in conformity with accounting practices prescribed or permitted by the State of Delaware Department of Insurance. The foregoing statement should not be taken as a complete statement of financial condition of the Endurance Assurance Corporation. Such a statement is available upon request at the Company's office located at 4 Manhattanville Road, Purchase, NY 10577.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Company at Purchase, New York.

John P. Miller 12/22/25

Subscribed and sworn to before me this 22nd day of December, 2025

Fiona McNamara

Fiona McNamara
STATE OF NEW YORK
NOTARY PUBLIC
Qualified in Rockland County
01MC5081895
MY COMMISSION EXPIRES 07/14/2029

PAYMENT BOND

Use for any contract for which a Payment Bond is required.

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, That we, _____

Zaman Construction Corp.

97-53 85th Street

Ozone Park, NY 11416

hereinafter referred to as the "Principal", and Endurance Assurance Corporation

4 Manhattanville Road

Purchase, NY 10577

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

Ten Million Seven Hundred Twenty Six Thousand Three Hundred Sixty Two Dollars and Zero Cents

($10,726,362.00) 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

Fort Washington Armory Roof Replacement/ HVAC Upgrade- 85025B0074-HH112FTRF

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns and other Subcontractors to whom Work under this Contract is sublet and his or their successors and assigns shall promptly pay or cause to be paid all lawful claims for

(a) Wages and compensation for labor performed and services rendered by all persons engaged in the prosecution of the Work under said Contract, and any amendment or extension thereof or addition thereto, whether such persons be agents servants or employees of the Principal or any such Subcontractor, including all persons so engaged who perform the work of laborers or mechanics at or in the vicinity of the site of the Project regardless of any contractual relationship between the Principal or such Subcontractors, or his or their successors or assigns, on the one hand and such laborers or mechanics on the other, but not including office employees not regularly stationed at the site of the project; and

(b) Materials and supplies (whether incorporated in the permanent structure or not), as well as teams, fuels, oils, implements or machinery furnished, used or consumed by said Principal or any subcontractor at or in the vicinity of the site of the Project in the prosecution of the Work under said Contract and any amendment or extension thereof or addition thereto; then this obligation shall be void, otherwise to remain infull force and effect.

This bond is subject to the following additional conditions, limitations and agreements:

(a) The Principal and Surety (Sureties) agree that this bond shall be for the benefit of any materialmen or laborer having a just claim, as well as the City itself.

(b) All persons who have performed labor, rendered services or furnished materials and supplies,as aforesaid, shall have a direct right of action against the Principal and his, its or their successors and assigns, and the Surety (Sureties) herein, or against either or both or any of them and their successors and assigns. Such persons may sue in their own name, and may prosecute the suit to judgment and execution without the necessity of joining with any other persons as party plaintiff.

(c) The Principal and Surety (Sureties) agree that neither of them will hold the City liable for any judgment for costs of otherwise, obtained by either or both of them against a laborer or materialman in a suit brought by either a laborer or materialman under this bond for moneys allegedly due for performing work or furnishing material.

(d) The Surety (Sureties) or its successors and assigns shall not be liable for any compensation recoverable by an employee or laborer under the Workmen's Compensation Law.

(e) In no event shall the Surety (Sureties), or its successors or assigns, be liable for a greater sum than the penalty of this bond or be subject to any suit, action or proceeding hereon that is instituted by any person, firm, or corporation hereunder later than two years after the complete performance of said Contract and final settlement thereof.

The Principal, for himself and his successors and assigns, and the Surety (Sureties), for itself and its successors and assigns, do hereby expressly waive any objection that might be interposed as to the rightof the City to require a bond containing the foregoing provisions, and they do hereby further expressly 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 place in this bond.

And the Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties), and its bonds shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or of the said Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any part thereof, or of any Work to be performed, or any moneys due to become due thereunder and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, Subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done or in relation to said Principal.

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their handsand seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this 05 day of January, 2026.

(Seal) Zaman Construction Corp. (L.S.)Principal

By: JAVID MINTO, President

(Seal) Endurance Assurance Corporation Surety

By: Pamela Lipkin-Sauertig, Attorney-in-Fact

(Seal) _____ Surety

By: _____

(Seal) _____ Surety

By: _____

(Seal) _____ Surety

By: _____

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

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

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

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of NY County of Queens ss:

On this 5 day of January, 2026 before me personally came JAHID MINTO to me known, who, being by me duly sworn did depose and say that he resides at 87 Tehama St. Brooklyn that he is the President of the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation, and that he signed his name thereto by like order.

MD A RAHMAN
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01RA6318032
Qualified in Queens County
Commission Expires 01/20/2027

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of_____ County of_____ ss:

On this_____day of_____,_____, before me personally appeared _____ to me known, and known to me to be one of the members of the firm of _____ described in and who executed the foregoing instrument; and he acknowledged to me that he executed the same as and for the act and deed of said firm.

_____
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of_____ County of_____ ss:

On this _____ day of_____,_____, before me personally appeared _____ to me known, and known to me to be the person described in and who executed the foregoing instrument; and acknowledged that he executed the same.

_____
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bondis executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * * * * *

Affix Acknowledgments and Justification of Sureties.

SURETY ACKNOWLEDGEMENT

State of **New Jersey**
SS:
County of **Morris**

On this **5th** day of **January , 2026,** before me personally comes **Pamela Lipkin-Sauertig** to me known, who, being by me duly sworn, deposes and says that she is the Attorney-In-Fact of the **Endurance Assurance Corporation** the Corporation described in and which executed the foregoing instrument; that she knows that seal of said Corporation; that the seal affixed to the said instrument is such Corporate seal; that it was so affixed by the order of the Board of Directors of the said Corporation, and that she signed her name thereto by like order.

NICOLE KAETZEL NOTARY PUBLIC NEW JERSEY

(Signature and Title of Official Taking Acknowledgement)

Nicole Kaetzel
NOTARY PUBLIC
STATE OF NEW JERSEY
MY COMMISSION EXPIRES APRIL 9, 2030
COMMISSION: #50125852

SOMPO INTERNATIONAL
INSURANCE

POWER OF ATTORNEY

11921

KNOW ALL BY THESE PRESENTS, that **Endurance Assurance Corporation**, a Delaware corporation, **Endurance American Insurance Company**, a Delaware corporation, **Lexon Insurance Company**, a Texas corporation, and/or **Bond Safeguard Insurance Company**, a South Dakota corporation, each, a "Company" and collectively, "**Sompo International**," do hereby constitute and appoint: **Pamela Lipkin-Sauertig, Robyn Rost** as true and lawful Attorney(s)-In-Fact to make, execute, seal, and deliver for, and on its behalf as surety or co-surety; bonds and undertakings given for any and all purposes, also to execute and deliver on its behalf as aforesaid renewals, extensions, agreements, waivers, consents or stipulations relating to such bonds or undertakings provided, however, that no single bond or undertaking so made, executed and delivered shall obligate the Company for any portion of the penal sum thereof in excess of the sum of **ONE HUNDRED MILLION Dollars ($100,000,000.00).**

Such bonds and undertakings for said purposes, when duly executed by said attorney(s)-in-fact, shall be binding upon the Company as fully and to the same extent as if signed by the President of the Company under its corporate seal attested by its Corporate Secretary.

This appointment is made under and by authority of certain resolutions adopted by the sole shareholder of each Company by unanimous written consent effective the 15th day of June, 2019, a copy of which appears below under the heading entitled "Certificate".

This Power of Attorney is signed and sealed by facsimile under and by authority of the following resolution adopted by the sole shareholder of each Company by unanimous written consent effective the 15th day of June, 2019 and said resolution has not since been revoked, amended or repealed:

RESOLVED, that the signature of an individual named above and the seal of the Company may be affixed to any such power of attorney or any certificate relating thereto by facsimile, and any such power of attorney or certificate bearing such facsimile signature or seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN WITNESS WHEREOF, each Company has caused this instrument to be signed by the following officers, and its corporate seal to be affixed this 15th day of June, 2019.

Endurance Assurance Corporation
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Endurance American Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Lexon Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Bond Safeguard Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

ACKNOWLEDGEMENT

On this 15th day of June, 2019, before me, personally came the above signatories known to me, who being duly sworn, did depose and say that he/they is an officer of each of the Companies; and that he executed said instrument on behalf of each Company by authority of his office under the by-laws of each Company.

By: Amy Taylor
Amy Taylor, Notary Public – My Commission Expires 3/9/27

CERTIFICATE

I, the undersigned Officer of each Company, DO HEREBY CERTIFY that:

1. That the original power of attorney of which the foregoing is a copy was duly executed on behalf of each Company and has not since been revoked, amended or modified; that the undersigned has compared the foregoing copy thereof with the original power of attorney, and that the same is a true and correct copy of the original power of attorney and of the whole thereof;
2. The following are resolutions which were adopted by the sole shareholder of each Company by unanimous written consent effective June 15, 2019 and said resolutions have not since been revoked, amended or modified:

   "RESOLVED, that each of the individuals named below is authorized to make, execute, seal and deliver for and on behalf of the Company any and all bonds, undertakings or obligations in surety or co-surety with others: RICHARD M. APPEL, BRIAN J. BEGGS, CHRISTOPHER DONELAN, SHARON L. SIMS, CHRISTOPHER L. SPARRO, MARIANNE L. WILBERT

   ; and be it further

   RESOLVED, that each of the individuals named above is authorized to appoint attorneys-in-fact for the purpose of making, executing, sealing and delivering bonds, undertakings or obligations in surety or co-surety for and on behalf of the Company."
3. The undersigned further certifies that the above resolutions are true and correct copies of the resolutions as so recorded and of the whole thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal this 05 day of January, 20 26.

By:
Daniel S. Lurie, Secretary

NOTICE: U. S. TREASURY DEPARTMENT'S OFFICE OF FOREIGN ASSETS CONTROL (OFAC)

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ENDURANCE ASSURANCE CORPORATION
Balance Sheet - Statutory - Basis
December 31, 2024

Assets:		
Bonds	$	9,575,738,600
Preferred stocks		15,965,244
Common stocks		2,974,058,744
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Other invested assets		382,161,094
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Receivables from parent, subsidiaries and affiliates		38,811,391
Other assets		396,387,073
Total admitted assets	$	**19,035,277,627**
Liabilities:		
Loss and loss adjustment expenses	$	7,434,113,469
Reinsurance payable on paid loss and loss adjustment expenses		797,536,780
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Total liabilities		**14,753,977,313**
Capital and surplus:		
Common capital stock		5,000,000
Gross paid in and contributed surplus		3,480,137,280
Unassigned funds (surplus)		794,870,512
Aggregate write-ins for special surplus funds		1,292,522
Total capital and surplus		**4,281,300,314**
Total liabilities and capital and surplus	$	**19,035,277,627**

I, John P. Miller, Vice President of Endurance Services Limited (the "Company") do hereby certify that to the best of my knowledge and belief, the foregoing is a full and true Statutory Statement of Admitted Assets, Liabilities, Capital and Surplus of the Endurance Assurance Corporation as of December 31, 2024 prepared in conformity with accounting practices prescribed or permitted by the State of Delaware Department of Insurance. The foregoing statement should not be taken as a complete statement of financial condition of the Endurance Assurance Corporation. Such a statement is available upon request at the Company's office located at 4 Manhattanville Road, Purchase, NY 10577.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Company at Purchase, New York.

John P. Miller 12/22/25

Subscribed and sworn to before me this 22nd day of December, 2025

Fiona McNamara

Fiona McNamara
STATE OF NEW YORK
NOTARY PUBLIC
Qualified in Rockland County
01MC5081895
MY COMMISSION EXPIRES 07/14/2029

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 12/31/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Sukhwinder Singh	
Singh & Company, Inc. 111-11 101st Avenue S Richmond Hill, NY 11419	PHONE (A/C, No, Ext): 718-785-4238	FAX (A/C, No): 718-709-7788
	E-MAIL ADDRESS: insurance@singhandcompany.com	

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Clear Blue Insurance Company	28860
INSURER B : Farmers Insurance Company	21628
INSURER C : Westchester Surplus Lines insurance Company	10172
INSURER D : Lloyd's of London	085202
INSURER E :	
INSURER F :	

INSURED
Zaman Construction Corp.
97-53 85th Street
Ozone Park, NY 11416

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR X Contractual Liability X Primary & Non-Contributory GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC X OTHER: Retention: $25,000	X	X	CZ01NYGL0044-06	07/27/2025	07/27/2026	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG Policy General Aggreagte	$ 2,000,000 $ 100,000 $ 5,000 $ 2,000,000 $ 4,000,000 $ 4,000,000 $ 10,000,000
B	AUTOMOBILE LIABILITY [ ] ANY AUTO [ ] OWNED AUTOS ONLY [X] SCHEDULED AUTOS X HIRED AUTOS ONLY [X] NON-OWNED AUTOS ONLY [ ]	X	X	60707-70-04	05/04/2025	05/04/2026	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) 	$ 2,000,000 $ $ $ $
A	[ ] UMBRELLA LIAB [X] OCCUR X EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $	X	X	CZ11NY3X0046-06	07/27/2025	07/27/2026	EACH OCCURRENCE AGGREGATE Poducts-Comp/OP AGG	$ 3,000,000 $ 3,000,000 $
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [ ] (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A					[ ] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ $ $
A	Excess Liability	X	X	CZ12NY5X0039-06	07/27/2025	07/27/2026	Occurrence/Aggregates	$5,000,000/$5,000,000
C	Pollution Liability			G74270426 004	08/17/2025	08/17/2026	Occurrence/Aggregates	$5,000,000/$5,000,000
D	Professional Liability			ANE0727	07/27/2025	07/27/2026	Occurrence/Aggregates	$2,000,000/$2,000,000

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

The coverage is broad enough to cover all the operations of the insured as per policy terms & conditions.

Re: HH112FTRF

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 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 12; and Fort Washington Armory Foundation. The Commercial General Liability policy is primary and non-contributory and is as broad as the most recent CG 20 01 12 19 form.

CERTIFICATE HOLDER

The City of New York
Department of Design and Construction
Division of Public Buildings
30-30 Thomson Avenue
Long Island City NY 11101

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Sukhwinder Singh 

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NYSIF
New York State Insurance Fund

PO Box 66699, Albany, NY 12206
| nysif.com

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

^ ^ ^ ^ ^ ^ 320113412
ZAMAN CONSTRUCTION CORP
97-53 85TH ST
OZONE PARK NY 11416

SCAN TO VALIDATE
AND SUBSCRIBE

POLICYHOLDER	CERTIFICATE HOLDER
ZAMAN CONSTRUCTION CORP 97-53 85TH ST OZONE PARK NY 11416	THE CITY OF NEW YORK DEPARTMENT OF DESIGN AND CONSTRUCTION DIVISION OF PUBLIC BUILDINGS 30-30 THOMSON AVENUE LONG ISLAND CITY NY 11101

POLICY NUMBER	CERTIFICATE NUMBER	POLICY PERIOD	DATE
Z2657 478-0	288330	07/27/2025 TO 04/01/2026	12/31/2025

THIS IS TO CERTIFY THAT THE POLICYHOLDER NAMED ABOVE IS INSURED WITH THE NEW YORK STATE INSURANCE FUND UNDER POLICY NO. 2657 478-0, COVERING THE ENTIRE OBLIGATION OF THIS POLICYHOLDER FOR WORKERS' COMPENSATION UNDER THE NEW YORK WORKERS' COMPENSATION LAW WITH RESPECT TO ALL OPERATIONS IN THE STATE OF NEW YORK, EXCEPT AS INDICATED BELOW, AND, WITH RESPECT TO OPERATIONS OUTSIDE OF NEW YORK, TO THE POLICYHOLDER'S REGULAR NEW YORK STATE EMPLOYEES ONLY.

IF YOU WISH TO RECEIVE NOTIFICATIONS REGARDING SAID POLICY, INCLUDING ANY NOTIFICATION OF CANCELLATIONS, OR TO VALIDATE THIS CERTIFICATE, VISIT OUR WEBSITE AT HTTPS://WWW.NYSIF.COM/CERT/CERTVAL.ASP. THE NEW YORK STATE INSURANCE FUND IS NOT LIABLE IN THE EVENT OF FAILURE TO GIVE SUCH NOTIFICATIONS.

THIS POLICY DOES NOT COVER CLAIMS OR SUITS THAT ARISE FROM BODILY INJURY SUFFERED BY THE OFFICERS OF THE INSURED CORPORATION.

PRESIDENT
JAHID MINTO
ZAMAN CONSTRUCTION CORP
1 OF 1

THE POLICY INCLUDES A WAIVER OF SUBROGATION ENDORSEMENT UNDER WHICH NYSIF AGREES TO WAIVE ITS RIGHT OF SUBROGATION TO BRING AN ACTION AGAINST THE CERTIFICATE HOLDER TO RECOVER AMOUNTS WE PAID IN WORKERS' COMPENSATION AND/OR MEDICAL BENEFITS TO OR ON BEHALF OF AN EMPLOYEE OF OUR INSURED IN THE EVENT THAT, PRIOR TO THE DATE OF THE ACCIDENT, THE CERTIFICATE HOLDER HAS ENTERED INTO A WRITTEN CONTRACT WITH OUR INSURED THAT REQUIRES THAT SUCH RIGHT OF SUBROGATION BE WAIVED.

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS NOR INSURANCE COVERAGE UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICY.

BY CAUSING THIS CERTIFICATE TO BE ISSUED TO THE CERTIFICATE HOLDER, THE POLICYHOLDER UNDERTAKES TO PROVIDE THE CERTIFICATE HOLDER 30 CALENDAR DAYS' NOTICE OF ANY CANCELLATION OF THE POLICY.

NEW YORK STATE INSURANCE FUND

DIRECTOR,INSURANCE FUND UNDERWRITING

VALIDATION NUMBER: 88138565

U-26.3

NEW YORK STATE | 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)
ZAMAN CONSTRUCTION CORP
97-53 85TH STREET
OZONE PARK, NY 11416

Work Location of Insured *(Only required if coverage is specifically limited to certain locations in New York State, i.e., Wrap-Up Policy)*

1b. Business Telephone Number of Insured
718-436-4150

1c. Federal Employer Identification Number of Insured or Social Security Number
320113412

2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder)
THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS
30-30 THOMSON AVENUE
LONG ISLAND CITY NY 11101

3a. Name of Insurance Carrier
ShelterPoint Life Insurance Company

3b. Policy Number of Entity Listed in Box "1a"
DBL673367

3c. Policy effective period
07/27/2025 to 07/26/2026

4. Policy provides the following benefits:
- [x] A. Both disability and paid family leave benefits.
- [ ] B. Disability benefits only.
- [ ] C. Paid family leave benefits only.

5. Policy covers:
- [x] A. All of the employer's employees eligible under the NYS Disability and Paid Family Leave Benefits Law.
- [ ] B. Only the following class or classes of employer's employees:

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has NYS Disability and/or Paid Family Leave Benefits insurance coverage as described above.

Date Signed 12/31/2025 By _____
(Signature of insurance carrier's authorized representative or NYS Licensed Insurance Agent of that insurance carrier)

Telephone Number 516-829-8100 Name and Title Wade Harrison, President

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.

Singh & Company Inc.
[Name of broker or agent (typewritten)]

111-11 101st Avenue, South Richmond Hill NY 11419
[Address of broker or agent (typewritten)]

Insurance@singhandcompany.com
[Email address of broker or agent (typewritten)]

718-785-4238/ 718-709-7788
[Phone number/Fax number of broker or agent (typewritten)]

[Signature of authorized official, broker, or agent]

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

State of ..New York.....)
) ss.:
County of ..Queens.....)

Sworn to before me this 8th day of January 2026

NOTARY PUBLIC FOR THE STATE OF New York

HARJIT KAUR
Notary Public, State of New York
Reg. No. 01KA6280094
Qualified in Queens County
Commission Expires 04/22/2029

Docusign Envelope ID: E83B1741-84C5-4347-B24E-5A0540525640

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 **ZAMAN CONSTRUCTION CORP** ("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 **85025B0074-HH112FTRF**.

1. Bid Bond Sign - Jan 21 2026 4:34PM
2. Broker Cert - 01 08 2026 - Jan 9 2026 5:33PM
3. CERTIFICATE OF CONTRACTOR REGISTRATION(1) - Jan 8 2026 7:35PM
4. DBL - DDC - Jan 9 2026 5:33PM
5. HH112FTRF Section3.4BidBreakdown_ZamanConstruction - Jan 14 2026 3:26PM
6. HH112FTRF_Addendum_3 - Sep 24 2025 1:21PM
7. HH112FTRF_Addendum1 - Sep 9 2025 12:18PM
8. HH112FTRF_Addendum2 - Sep 12 2025 12:38PM
9. HH112FTRF_BidDrawings - May 30 2025 6:53PM
10. HH112FTRF_Notice of Postponement_2025-0902 - Sep 2 2025 5:05PM
11. HH112FTRF_Special Experience Requirements - Jan 8 2026 7:37PM
12. HH112FTRF_Volume_2. (2) - Jan 14 2026 3:26PM
13. HH112FTRF_Volume_3 - Jun 30 2025 2:52PM
14. Insurance Certificate_GL - DDC - Jan 9 2026 5:31PM
15. Payment and Performance Bond - Jan 9 2026 5:30PM
16. Proposal_Bid_85025B0074001.pdf - Jan 7 2026 8:18PM
17. RFx Document_85025B0074001 (1).pdf - Dec 30 2025 8:19PM
18. Schedule B - MWBE Utilization Plan - Jul 3 2025 12:16PM
19. Subcontractor ID Form.....-4(1) - Sep 29 2025 5:44PM
20. Volume 1 PB Bid Booklet PLA - Jan 14 2026 3:27PM
21. WC - DDC - Jan 9 2026 5:33PM

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.

Docusign Envelope ID: E83B1741-84C5-4347-B24E-5A0540525640

The City of New York
By: **DEPARTMENT OF DESIGN AND CONSTRUCTION**

DocuSigned by:
ERIC MACFARLANE
1A87ABA0188B41C...

(Signature)

Name: ERIC MACFARLANE

Title: First Deputy Commissioner

Date: 1/23/2026 | 19:23:07 PST

Contractor
By: **ZAMAN CONSTRUCTION CORP**

Signed by:
Jahaid Minto
C4485DCD8E724E3...

(Signature)

Name: Jahaid Minto

Title: President

Date: 1/23/2026 | 12:37:55 PST

Docusign Envelope ID: E83B1741-84C5-4347-B24E-5A0540525640

Signatures

Number of pages (including this one): 3

- ✓ Document signed electronically, the signatories agreeing that it is authentic between them.
- ✓ By signing this document, the signatories acknowledge and agree that they have carefully read this document and approve all its terms.

Nom:	Minto Jahid	Place: Queens
Fonction:	President	Date: Signed by: 1/23/2026 | 12:37:55 PST Jahaid Minto C4485DCD8E724E3...

Nom:	Macfarlane Eric	Place: LIC ny
Fonction:		Date: DocuSigned by: 1/23/2026 | 19:23:07 PST ERIC MACFARLANE 1A87ABA0188B41C...

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the Citythat the City has determined that the Principal is in default of the Contract, to (1) pay the City the cost tocomplete the contract as determined by the City in excess of the balance of the Contract held by the City, plus any damages or costs to which the City is entitled, up to the full amount of the above penal sum, (2)fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof, or (3) tender a completion Contractor that is acceptable to the City. The Surety (Sureties) further agrees, at its option, either to notify the City that it elects to pay the city thecost of completion plus any applicable damages and costs under option (1) above, or to commence anddiligently perform the Work specified in the Contract, including physical site work, within twenty-five
(25) business days after written notice thereof from the City and, if the Surety elects to fully perform and complete the Work, then to complete all Work within the time set forth in the Contract or such other timeas agreed to between the City and Surety in accordance with the Contract. If the Surety elects to tender payment pursuant to (1) above, then the Surety shall tender such amount within fifteen (15) business days notification from the City of the cost of completion. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to pay the City the costof completion, to commence and complete all Work as provided herein, or to tender a completion contractor.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected byany extension of time, modification, omission, addition, or change in or to the said Contract or the Workto be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions,changes, payments, and waivers, and hereby expressly stipulates and agrees that any and all things doneand omitted to be done by and in relation to subcontractors shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal. Notwithstanding the above, if the City makes payments to the Principal before the time required by the contract that in the aggregate exceed $100,000 or 10% of the Contract price, whichever is less, and that have not become earned prior to the Principal being found to be in default, then all payments made to the Principal before the time required by the Contract shall be added to the remaining contract value available to be paid forthe completion of the Contract as if such sums had not been paid to the Principal, but shall not provide abasis for non-performance of its obligation to pay the City the cost of completion, to commence and to complete all Work as provided herein, or to tender a completion contractor.

LABOR LAW ARTICLE 8 - NYC PUBLIC WORKS

Workers, Laborers and Mechanics employed on a public work project must receive not less than the prevailing rate of wage and benefits for the classification of work performed by each upon such public work. Pursuant to New York Labor Law Article 8 the Comptroller of the City of New York has promulgated this schedule solely for Workers, Laborers and Mechanics engaged by private contractors on New York City public work projects. Prevailing rates are required to be annexed to and form part of the public work contract pursuant to Labor Law section 220 (3).

This schedule is a compilation of separate determinations of the prevailing rate of wage and supplements made by the Comptroller for each trade classification listed herein pursuant to Labor Law section 220 (5). The source of the wage and supplement rates, whether a collective bargaining agreement, survey data or other, is listed at the end of each classification.

Agency Chief Contracting Officers should contact the Bureau of Labor Law's Classification Unit with any questions concerning trade classifications, prevailing rates or prevailing practices with respect to procurement on New York City public work contracts. Contractors are advised to review the Comptroller's Prevailing Wage Schedule before bidding on public work contracts. Contractors with questions concerning trade classifications, prevailing rates or prevailing practices with respect to public work contracts in the procurement stage must contact the contracting agency responsible for the procurement.

Any error as to compensation under the prevailing wage law or other information as to trade classification, made by the contracting agency in the contract documents or in any other communication, will not preclude a finding against the contractor of prevailing wage violation.

Any questions concerning trade classifications, prevailing rates or prevailing practices on New York City public work contracts that have already been awarded may be directed to the Bureau of Labor Law's Classification Unit by calling (212) 669-4443. All callers must have the agency name and contract registration number available when calling with questions on public work contracts. Please direct all other compliance issues to: laborlaw@comptroller.nyc.gov or Bureau of Labor Law, Attn: Paul Brumlik, Office of the Comptroller, 1 Centre Street, Room 651, New York, N.Y. 10007.

Pursuant to Labor Law § 220 (3-a) (a), the appropriate schedule of prevailing wages and benefits must be posted in a prominent and accessible place at all public work sites along with the Construction Poster provided on our web site at comptroller.nyc.gov/wages. In addition, covered employees must be given the appropriate schedule of prevailing wages and benefits along with the Worker Notice provided on our web site at the time the public work project begins, and with the first paycheck to each such employee after July first of each year.

This schedule is applicable to work performed during the effective period, unless otherwise noted. Changes to this schedule are published on our web site comptroller.nyc.gov/wages. Contractors must pay the wages and supplements in effect when the worker, laborer, mechanic performs the work. Preliminary schedules for future one-year periods appear in the City Record on or about June 1 each succeeding year. Final schedules appear on or about July 1 in the City Record and on our web site comptroller.nyc.gov/wages.

Prevailing rates and ratios for apprentices are published in the Construction Apprentice Prevailing Wage Schedule. Pursuant to Labor Law § 220 (3-e), only apprentices who are individually

registered in a bona fide program to which the employer contractor is a participant, registered with the New York State Department of Labor, may be paid at the apprentice rates. Apprentices who are not so registered must be paid as journey persons.

New York City public work projects awarded pursuant to a Project Labor Agreement ("PLA") in accordance with Labor Law section 222 may have different labor standards for shift, premium and overtime work. Please refer to the PLA's pre-negotiated labor agreements for wage and benefit rates applicable to work performed outside of the regular workday. More information is available at the Mayor's Office of Contract Services (MOCS) web page at:

https://www.nyc.gov/site/mocs/regulations/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

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ASBESTOS HANDLER

SEE HAZARDOUS MATERIAL HANDLER

BLASTER

Blaster

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $58.81
Supplemental Benefit Rate per Hour: $55.73

Blaster - Hydraulic Trac Drill

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $52.95
Supplemental Benefit Rate per Hour: $55.73

Blaster - Wagon: Air Trac: Quarry Bar: Drillrunners

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $52.12
Supplemental Benefit Rate per Hour: $55.73

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $45.60
Supplemental Benefit Rate per Hour: $55.73

Blaster - Magazine Keepers: (Watch Person)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $22.80
Supplemental Benefit Rate per Hour: $55.73

Overtime Description

Paid Holidays: Labor Day, Thanksgiving Day.

Excluding Supplemental Benefits.

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

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $68.88
Supplemental Benefit Rate per Hour: $49.83
Supplemental Note: For time and one half overtime - $74.17 For double overtime - $98.51

Overtime Description
For Repair and Maintenance work:
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
For New Construction work:
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Quadruple time the regular rate for work on the following holiday(s).
Labor Day

Paid Holidays
Good Friday
Day after Thanksgiving
Day before Christmas
Day before New Year's Day

Shift Rates
On jobs requiring two (2) or three (3) shifts, the first shift shall work eight (8) hours at the regular straight-time hourly rate. The second shift shall work eight (8) hours and receive eight hours at the regular straight time hourly rate plus two dollars ($2.00) per hour. The third shift shall work eight (8) hours and receive eight hours at the regular straight time hourly rate plus two dollars and twenty-five cents ($2.25) per hour.

(Local #5)

BRICKLAYER

Bricklayer

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $60.04
Supplemental Benefit Rate per Hour: $45.35

Overtime Description
Time and one half the regular rate after a 7 hour day. If working on a job that is predominately Pointer, Cleaner, Caulker work, then Time and one half the regular rate after an 8 hour day.

Overtime
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
The second shift wage rate shall be a 15% wage premium with no premium for supplemental benefits. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, eight hours will be paid at straight time rate for seven hours of work.

(Bricklayer District Council)

CARPENTER - BUILDING COMMERCIAL

Building Commercial

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $59.05
Supplemental Benefit Rate per Hour: $49.08

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day

Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
The second shift will receive one hour at the double time rate of pay for the last hour of the shift; eight hours pay for seven hours of work, nine hours pay for eight hours of work. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - HEAVY CONSTRUCTION WORK
(Construction of Engineered Structures and Building Foundations including all form work)

Heavy Construction Work

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $61.59
Supplemental Benefit Rate per Hour: $56.84

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate and the supplemental benefits shall be paid at the straight time rate. When two (2) or more shifts of Carpenters are employed, single time will be paid for each shift.

(Carpenters District Council)

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

Carpenter High Rise A

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $51.48
Supplemental Benefit Rate per Hour: $44.74

Carpenter High Rise B

Carpenter High Rise B worker is excluded from high risk operations such as erection decking, perimeter debris netting, leading edge work, self-climbing form systems, and the installation of cocoon systems unless directly supervised by a Carpenter High Rise A worker.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $40.89
Supplemental Benefit Rate per Hour: $18.05

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday

Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
The second shift wage rate shall be 113% of the straight time hourly wage rate. However, any shift beginning after 5:00 P.M. shall be paid at time and one half the regular hourly rate. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - SIDEWALK SHED, SCAFFOLD AND HOIST

Carpenter - Hod Hoist

(Assisted by Mason Tender)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $56.20
Supplemental Benefit Rate per Hour: $49.95

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day

Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
The second shift will receive 112% of the straight time hourly rate. Benefit fund contributions shall be paid at the straight time rate. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - WOOD WATER STORAGE TANK

Tank Mechanic

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $38.83
Supplemental Benefit Rate per Hour: $26.06

Tank Helper

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $30.44
Supplemental Benefit Rate per Hour: $26.06

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day

Columbus Day
Thanksgiving Day
Day after Thanksgiving
1/2 day on Christmas Eve if work is performed in the A.M.
Christmas Day
1/2 day on New Year's Eve if work is performed in the A.M.

Vacation

Employed for one (1) year.....one (1) week vacation (40 hours)
Employed for three (3) years.....two (2) weeks vacation (80 hours)
Employed for more than twenty (20) years.....three (3) weeks vacation (120 hours)

SICK LEAVE:
Two (2) sick days after being employed for twenty (20) years.

(Carpenters District Council)

CEMENT & CONCRETE WORKER

Building Work

Cement & Concrete Worker

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $47.28
Supplemental Benefit Rate per Hour: $34.20
Supplemental Note: $39.20 on Saturdays; $44.20 on Sundays & Holidays

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $36.80
Supplemental Benefit Rate per Hour: $26.20
Supplemental Note: $29.20 on Saturdays; $32.20 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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $59.87
Supplemental Benefit Rate per Hour: $34.76
Supplemental Note: Supplemental benefit time and one half rate: $63.22; Double time rate: double the base supplemental benefit rate.

Overtime Description
Time and one-half the regular rate after an 8 hour day, double time the regular rate after 10 hours. Time and one-half the regular rate on Saturday, double time the regular rate after 10 hours. Double time the regular rate on Sunday. Four Days a week at Ten (10) hours straight time is allowed.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day

Thanksgiving Day
Christmas Day

Paid Holidays

Any worker who reports to work on Christmas Eve or New Year's Eve pursuant to his employer's instruction shall be entitled to three (3) hours afternoon pay without working.

Shift Rates

For off shift work, (at times other than the regular 7:00 A.M. to 3:30 P.M. work day) a cement mason shall be paid at the regular hourly rate plus a 25% per hour differential.

(Local #780) (BCA)

CORE DRILLER

Test Boring

Core Driller

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $47.88
Supplemental Benefit Rate per Hour: $34.35

Core Driller Helper

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $37.58
Supplemental Benefit Rate per Hour: $34.35

Core Driller Helper(Third year in the industry)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $33.80
Supplemental Benefit Rate per Hour: $34.35

Core Driller Helper (Second year in the industry)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $30.04
Supplemental Benefit Rate per Hour: $34.35

Core Driller Helper (First year in the industry)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $26.26
Supplemental Benefit Rate per Hour: $34.35

Overtime Description
Time and one half the regular rate for work on a holiday plus Holiday pay when worked.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Memorial Day
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Christmas Day

Shift Rates
When two (2) or more shifts are employed, single time shall be paid for each shift, but those employees employed on a shift other than from 8:00 A.M. to 5:00 P.M. shall, in addition, receive two dollars ($2.00) per hour differential for each hour worked. When three (3) shifts are needed, each shift shall work seven and one-half (7 ½) hours paid for eight (8) hours of labor and be permitted one-half (½) hour for mealtime.

(Carpenters District Council)

DERRICKPERSON AND RIGGER

Derrick Person & Rigger

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $61.11
Supplemental Benefit Rate per Hour: $62.71

Derrick Person & Rigger - Site Work

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

Effective Period: 7/1/2025 - 6/30/2026

Wage Rate per Hour: **$48.40**
Supplemental Benefit Rate per Hour: **$49.70**

Overtime Description
The first two hours of overtime on weekdays and the first seven hours of work on Saturdays are paid at time and one half for wages and supplemental benefits. All additional overtimes is paid at double time for wages and supplemental benefits.

Overtime
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

(Local #197)

DIVER

Diver (Marine)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: **$76.46**
Supplemental Benefit Rate per Hour: **$56.84**

Diver Tender (Marine)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: **$56.00**
Supplemental Benefit Rate per Hour: **$56.84**

Overtime
Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When three shifts are utilized each shift shall work seven and one half-hours (7 1/2 hours) and paid for 8 hours, allowing for one half hour for lunch.

(Carpenters District Council)

DOCKBUILDER - PILE DRIVER

Dockbuilder - Pile Driver

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $61.59
Supplemental Benefit Rate per Hour: $56.84

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day

Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate and the supplemental benefits shall be paid at the straight time rate. When two (2) or more shifts of Dockbuilders are employed, single time will be paid for each shift.

(Carpenters District Council)

DRIVER: TRUCK (TEAMSTER)

Including work involving the delivery to and hauling from such worksites of aggregate supply construction materials and any time spent loading/unloading

Driver - Dump Truck

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $46.12
Supplemental Benefit Rate per Hour: $59.65
Supplemental Note: Over 40 hours worked: at time and one half rate - $25.50; at double time rate - $34.00

Driver - Tractor Trailer

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $48.82
Supplemental Benefit Rate per Hour: $57.65
Supplemental Note: Over 40 hours worked: at time and one half rate - $26.33; at double time rate - $35.10

Driver - Euclid & Turnapull Operator

Effective Period: 7/1/2025 - 6/30/2026

Wage Rate per Hour: $49.38
Supplemental Benefit Rate per Hour: $57.65
Supplemental Note: Over 40 hours worked: at time and one half rate - $26.33; at double time rate - $35.10

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.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Shift Rates
Off shift work commencing between 6:00 P.M. and 5:00 A.M. shall work eight and one half (8 1/2) hours allowing for one half hour for lunch

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Driver Redi-Mix (Sand & Gravel)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $44.50
Supplemental Benefit Rate per Hour: $52.22
Supplemental Note: Over 40 hours worked: time and one half rate $22.35; double time rate $29.80

Overtime Description
For Paid Holidays: Employees who do not work on a contractual holiday shall be compensated two (2) hours extra pay in straight time wages and benefits for every day on which the Employee does not pass up a day's work during the calendar week (Sunday through Saturday) of the holiday, up to a maximum of ten (10) hours in wages and eight (8) hours in benefit contributions for the holiday

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
Martin Luther King Jr. Day
President's Day
Columbus Day
Veteran's Day

Triple time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Christmas Day

(Local #282)

ELECTRICIAN
(Including installation of low voltage cabling carrying data, video and/or voice on building construction/alteration/renovation projects.)

Electrician "A" (Regular Day / Day Shift)

Effective Period: 7/1/2025 - 1/1/2026
Wage Rate per Hour: $62.00
Supplemental Benefit Rate per Hour: $66.90
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 1/2/2026 - 4/15/2026
Wage Rate per Hour: $62.00
Supplemental Benefit Rate per Hour: $67.40
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $64.00
Supplemental Benefit Rate per Hour: $70.28
*** 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: 7/1/2025 - 1/1/2026
Wage Rate per Hour: $93.00
Supplemental Benefit Rate per Hour: $68.90
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 1/2/2026 - 4/15/2026
Wage Rate per Hour: $93.00
Supplemental Benefit Rate per Hour: $69.40
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $96.00
Supplemental Benefit Rate per Hour: $72.34
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Swing Shift)

Effective Period: 7/1/2025 - 1/1/2026
Wage Rate per Hour: $72.75
Supplemental Benefit Rate per Hour: $75.27
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 1/2/2026 - 4/15/2026
Wage Rate per Hour: $72.75
Supplemental Benefit Rate per Hour: $75.77
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $75.10
Supplemental Benefit Rate per Hour: $78.93

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

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

Effective Period: 7/1/2025 - 1/1/2026
Wage Rate per Hour: $109.13
Supplemental Benefit Rate per Hour: $77.61
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 1/2/2026 - 4/15/2026
Wage Rate per Hour: $109.13
Supplemental Benefit Rate per Hour: $78.11
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $112.65
Supplemental Benefit Rate per Hour: $81.35
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Graveyard Shift)

Effective Period: 7/1/2025 - 1/1/2026
Wage Rate per Hour: $81.49
Supplemental Benefit Rate per Hour: $82.39
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 1/2/2026 - 4/15/2026
Wage Rate per Hour: $81.49
Supplemental Benefit Rate per Hour: $82.89
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $84.12
Supplemental Benefit Rate per Hour: $86.28
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

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

Effective Period: 7/1/2025 - 1/1/2026
Wage Rate per Hour: $122.24
Supplemental Benefit Rate per Hour: $85.01
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 1/2/2026 - 4/15/2026
Wage Rate per Hour: $122.24
Supplemental Benefit Rate per Hour: $85.51
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $126.18
Supplemental Benefit Rate per Hour: $88.98
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

*** Supplemental Benefit Rate per Hour Note**
In addition to the Supplemental Benefit Rates per Hour listed above, the employer must provide an additional 6.2% of taxable gross pay earned on covered work only. This additional Supplemental Benefit Rate will terminate when the employee has contributed the maximum annual Social Security tax required by law, on all work performed.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on a holiday.
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
For multiple shifts of temporary light and/or power, the temporary light and/or power employee shall be paid for 8 hours at the straight time rate. For three or less workers performing 8 hours temporary light and/or power the supplemental benefit rate is $26.99, effective 1/2/2026 the supplemental benefit rate is $27.49, effective 4/16/2026 the supplemental benefit rate is $27.91 - See * Supplemental Benefit Rate per Hour Note above.

Electrician "M" 1st Year

"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: 7/1/2025 - 4/15/2026

Wage Rate per Hour: **$27.50**
Supplemental Benefit Rate per Hour: **$26.29**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: **$27.50**
Supplemental Benefit Rate per Hour: **$26.79**

Electrician "M" 1st Year (Overtime)

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: **$41.25**
Supplemental Benefit Rate per Hour: **$28.02**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: **$41.25**
Supplemental Benefit Rate per Hour: **$28.52**

Electrician "M" 2nd Year

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: **$28.50**
Supplemental Benefit Rate per Hour: **$26.82**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: **$28.50**
Supplemental Benefit Rate per Hour: **$27.32**

Electrician "M" 2nd Year (Overtime)

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: **$42.75**
Supplemental Benefit Rate per Hour: **$28.62**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: **$42.75**
Supplemental Benefit Rate per Hour: **$29.12**

Electrician "M" 3rd Year

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: **$30.50**
Supplemental Benefit Rate per Hour: **$27.90**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: **$30.50**
Supplemental Benefit Rate per Hour: **$28.40**

Electrician "M" 3rd Year (Overtime)

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $45.75
Supplemental Benefit Rate per Hour: $29.83

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $45.75
Supplemental Benefit Rate per Hour: $30.33

Electrician "M" 4th Year

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $33.50
Supplemental Benefit Rate per Hour: $29.51

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $33.50
Supplemental Benefit Rate per Hour: $30.01

Electrician "M" 4th Year (Overtime)

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $50.25
Supplemental Benefit Rate per Hour: $31.63

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $50.25
Supplemental Benefit Rate per Hour: $32.13

Electrician "M" 5th Year

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $36.50
Supplemental Benefit Rate per Hour: $31.12

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $36.50
Supplemental Benefit Rate per Hour: $31.62

Electrician "M" 5th Year (Overtime)

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $54.75
Supplemental Benefit Rate per Hour: $33.43

Effective Period: 4/16/2026 - 6/30/2026

Wage Rate per Hour: **$54.75**
Supplemental Benefit Rate per Hour: **$33.93**

Electrician "M" 6th Year

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: **$43.50**
Supplemental Benefit Rate per Hour: **$34.89**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: **$43.50**
Supplemental Benefit Rate per Hour: **$35.39**

Electrician "M" 6th Year (Overtime)

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: **$65.25**
Supplemental Benefit Rate per Hour: **$37.64**

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: **$65.25**
Supplemental Benefit Rate per Hour: **$38.14**

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $37.40
Supplemental Benefit Rate per Hour: $21.44
Supplemental Note: $19.31 only after 8 hours worked in a day

Overtime Description
Time and one half the regular rate for work on the following holidays: Columbus Day, Veterans Day, Day after Thanksgiving.
Double time the regular rate for work on the following holidays: New Year's day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Night Differential is based upon a ten percent (10%) differential between the hours of 4:00 P.M. and 12:30 A.M. and a fifteen percent (15%) differential for the hours 12:00 A.M. to 8:30 A.M.

Vacation
At least 1 year of employment.....ten (10) days
5 years or more of employment.....fifteen (15) days
10 years of employment.....twenty (20) days
Plus one Personal Day per year

Sick Days:
One day per Year. Up to 4 vacation days may be used as sick days.

(Local #3)

ELECTRICIAN-STREET LIGHTING WORKER

Electrician - Electro Pole Electrician

Effective Period: 7/1/2025 - 12/31/2025
Wage Rate per Hour: $62.00
Supplemental Benefit Rate per Hour: $69.01
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 1/1/2026 - 4/21/2026
Wage Rate per Hour: $62.00
Supplemental Benefit Rate per Hour: $69.51
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/22/2026 - 6/30/2026
Wage Rate per Hour: $64.00
Supplemental Benefit Rate per Hour: $72.46
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician - Electro Pole Foundation Installer

Effective Period: 7/1/2025 - 12/31/2025
Wage Rate per Hour: $47.66
Supplemental Benefit Rate per Hour: $51.27
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 1/1/2026 - 4/21/2026
Wage Rate per Hour: $47.66
Supplemental Benefit Rate per Hour: $51.77
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/22/2026 - 6/30/2026
Wage Rate per Hour: $49.66
Supplemental Benefit Rate per Hour: $53.91
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician - Electro Pole Maintainer

Effective Period: 7/1/2025 - 12/31/2025
Wage Rate per Hour: $41.61

Supplemental Benefit Rate per Hour: $46.32

Effective Period: 1/1/2026 - 4/21/2026
Wage Rate per Hour: $41.61
Supplemental Benefit Rate per Hour: $46.82

Effective Period: 4/22/2026 - 6/30/2026
Wage Rate per Hour: $43.61
Supplemental Benefit Rate per Hour: $48.96
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

*** Supplemental Benefit Rate per Hour Note**
In addition to the Supplemental Benefit Rates per Hour listed above, the employer must provide an additional 6.2% of taxable gross pay earned on covered work only. This additional Supplemental Benefit Rate will terminate when the employee has contributed the maximum annual Social Security tax required by law, on all work performed.

Overtime Description

Electrician - Electro Pole Electrician: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week.
Electrician - Electro Pole Foundation Installer: Time and one half the regular rate after 8 hours within a 24 hour period and Saturday and Sunday.
Electrician - Electro Pole Maintainer: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week. Saturdays and Sundays may be used as a make-up day at straight time when a day is lost during the week to inclement weather.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

(Local #3)

ELEVATOR CONSTRUCTOR

Elevator Constructor

Effective Period: 7/1/2025 - 3/16/2026
Wage Rate per Hour: $83.27
Supplemental Benefit Rate per Hour: $42.33

Effective Period: 3/17/2026 - 6/30/2026
Wage Rate per Hour: $86.43
Supplemental Benefit Rate per Hour: $43.43

Overtime Description
For New Construction: work performed after an 8 hour day, Saturday, Sunday or between 5:30pm and 6:00am shall be paid at double time rate.

Existing buildings: work performed after an 8 hour day, Saturday, Sunday or between 6:00pm and 5:00 am shall be paid time and one half.

Overtime
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Vacation
Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

Elevator Service/Modernization Mechanic

Effective Period: 7/1/2025 - 3/16/2026
Wage Rate per Hour: $65.54
Supplemental Benefit Rate per Hour: $42.28

Effective Period: 3/17/2026 - 6/30/2026
Wage Rate per Hour: $68.06
Supplemental Benefit Rate per Hour: $43.38

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 5:00am.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Afternoon shift - regularly hourly rate plus a (15%) fifteen percent differential. Graveyard shift - time and one half the regular rate.

Vacation
Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ENGINEER

Engineer - Heavy Construction Operating Engineer I

Cherrypickers 20 tons and over and Loaders (rubber tired and/or tractor type with a manufacturer's minimum rated capacity of six cubic yards and over).

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $78.33
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $125.33

Engineer - Heavy Construction Operating Engineer II

Backhoes, Basin Machines, Groover, Mechanical Sweepers, Bobcat, Boom Truck, Barrier Transport (Barrier Mover) & machines of similar nature. Operation of Churn Drills and machines of a similar nature, Stetco Silent Hoist and machines of similar nature, Vac-Alls, Meyers Machines, John Beam and machines of a similar nature, Ross Carriers and Travel Lifts and machines of a similar nature, Bulldozers, Scrapers and Turn-a-Pulls: Tugger Hoists (Used exclusively for handling excavated material); Tractors with attachments, Hyster and Roustabout Cranes, Cherrypickers. Austin Western, Grove and machines of a similar nature, Scoopmobiles, Monorails, Conveyors, Trenchers: Loaders-Rubber Tired and Tractor: Barber Greene and Eimco Loaders and Eimco Backhoes; Mighty Midget and similar breakers and Tampers, Curb and Gutter Pavers and Motor Patrol, Motor Graders and all machines of a similar nature. Locomotives 10 Tons or under. Mini-Max, Break-Tech and machines of a similar nature; Milling machines, robotic and demolition machines and machines of a similar nature, shot blaster, skid steer machines and machines of a similar nature including bobcat, pile rig rubber-tired excavator (37,000 lbs. and under), 2 person auger.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $75.84
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $121.34

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $71.70
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $114.72

Engineer - Heavy Construction Maintenance Engineer I

Installing, Repairing, Maintaining, Dismantling of all equipment including Steel Cutting, Bending and Heat Sealing Machines, Mechanical Heaters, Grout Pumps, Bentonite Pumps & Plants, Screening Machines, Fusion Coupling Machines, Tunnel Boring Machines Moles and Machines of a similar nature, Power Packs, Mechanical Hydraulic Jacks; all drill rigs including but not limited to Churn, Rotary Caisson, Raised Bore & Drills of a similar nature; Personnel, Inspection & Safety Boats or any boats used to perform functions of same, Mine Hoists, Whirlies, all Climbing Cranes, all Tower Cranes, including but not limited to Truck Mounted and Crawler Type and machines of similar nature; Maintaining Hydraulic Drills and machines of a similar nature; Well Point System-

Installation and dismantling; Burning, Welding, all Pumps regardless of size and/or motor power, except River Cofferdam Pumps and Wells Point Pumps; Motorized Buggies (three or more); equipment used in the cleaning and televising of sewers, but not limited to jet-rodder/vacuum truck, vacall/vactor, closed circuit television inspection equipment; high powered water pumps, jet pumps; screed machines and concrete finishing machines of a similar nature; vermeers.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $75.45
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $120.72

Engineer - Heavy Construction Maintenance Engineer II

On Base Mounted Tower Cranes

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $100.74
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $161.18

Engineer - Heavy Construction Maintenance Engineer III

On Generators, Light Towers

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $48.02
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $76.83

Engineer - Heavy Construction Maintenance Engineer IV

On Pumps and Mixers including mud sucking

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $49.39
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $79.02

Engineer - Heavy Construction Service Engineer

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $67.50
Supplemental Benefit Rate per Hour: $50.01

Supplemental Note: $92.62 on overtime
Shift Wage Rate: $108.00

Engineer - Heavy Construction Service Mechanic

Shovels: Cranes: Draglines: Backhoes: Keystones: Pavers: Trenching Machines: Gunite Machines: Compressors (three (3) or more in Battery): Crawler Cranes- having a straight lattice boom with no attachment or luffing boom, no jib and no auxiliary attachment.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $45.09
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $72.14

Engineer - Steel Erection Maintenance Engineers

Derrick, Travelers, Tower, Crawler Tower and Climbing Cranes

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $72.71
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $116.34

Engineer - Steel Erection Oiler I

On a Truck Crane

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $67.75
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $108.40

Engineer - Steel Erection Oiler II

On a Crawler Crane

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $47.58
Supplemental Benefit Rate per Hour: $50.01
Supplemental Note: $92.62 on overtime
Shift Wage Rate: $76.13

Overtime Description

On jobs of more than one shift, if the next shift employee fails to report for work through any cause over which the employer has no control, the employee on duty who works the next shift continues to work at the single time rate.

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Engineer - Building Work Maintenance Engineers I

Installing, repairing, maintaining, dismantling (of all equipment including: Steel Cutting and Bending Machines, Mechanical Heaters, Mine Hoists, Climbing Cranes, Tower Cranes, Linden Peine, Lorain, Liebherr, Mannes, or machines of a similar nature, Well Point Systems, Deep Well Pumps, Concrete Mixers with loading Device, Concrete Plants, Motor Generators when used for temporary power and lights), skid steer machines of a similar nature including bobcat.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $62.18
Supplemental Benefit Rate per Hour: $49.01
Supplemental Note: $90.80 on overtime

Engineer - Building Work Maintenance Engineers II

On Pumps, Generators, Mixers and Heaters

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $47.13
Supplemental Benefit Rate per Hour: $49.01
Supplemental Note: $90.80 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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $58.86
Supplemental Benefit Rate per Hour: $49.01
Supplemental Note: $90.80 on overtime

Engineer - Building Work Oilers II

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $42.39
Supplemental Benefit Rate per Hour: $49.01
Supplemental Note: $90.80 on overtime

Overtime Description
On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Shift Rates
When two (2) or more shifts are employed, single time will be paid for each shift.

(Local #15)

ENGINEER - CITY SURVEYOR AND CONSULTANT

Party Chief

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $46.32
Supplemental Benefit Rate per Hour: $29.32
Supplemental Note: Overtime Benefit Rate - $35.01 per hour (time & one half) $40.69 per hour (double time).

Instrument Person

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $37.60
Supplemental Benefit Rate per Hour: $29.32
Supplemental Note: Overtime Benefit Rate - $35.01 per hour (time & one half) $40.69 per hour (double time).

Rodperson

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $32.08
Supplemental Benefit Rate per Hour: $29.32
Supplemental Note: Overtime Benefit Rate - $35.01 per hour (time & one half) $40.69 per hour (double time).

Rodperson 1st Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $29.32
Supplemental Note: Overtime Benefit Rate - $35.01 per hour (time & one half) $40.69per hour (double time).

Overtime Description

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $70.53
Supplemental Benefit Rate per Hour: $44.03
Supplemental Note: Overtime Benefit Rate - $62.35 per hour (time & one half) $80.66 per hour (double time).

Field Engineer - BC Instrument Person

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $50.03
Supplemental Benefit Rate per Hour: $44.03
Supplemental Note: Overtime Benefit Rate - $62.35 per hour (time & one half) $80.66 per hour (double time).

Field Engineer - BC Rodperson

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $30.96
Supplemental Benefit Rate per Hour: $44.03
Supplemental Note: Overtime Benefit Rate - $62.35 per hour (time & one half) $80.66 per hour (double time).

Overtime Description

Time and one half the regular rate after a 7 hour work and time and one half the regular rate for Saturday for the first seven hours worked, Double time the regular time rate for Saturday for work performed in excess of seven hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
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

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $79.60
Supplemental Benefit Rate per Hour: $49.02
Supplemental Note: Overtime benefit rate - $69.71 per hour (time & one half), $90.40 per hour (double time).

Field Engineer - HC Instrument Person

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $56.67
Supplemental Benefit Rate per Hour: $49.02
Supplemental Note: Overtime benefit rate - $69.71 per hour (time & one half), $90.40 per hour (double time).

Field Engineer - HC Rodperson

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $46.48
Supplemental Benefit Rate per Hour: $49.02
Supplemental Note: Overtime benefit rate - $69.71 per hour (time & one half), $90.40 per hour (double time).

Field Engineer - HC Rodperson 1st Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $49.02
Supplemental Note: Overtime benefit rate - $69.71 per hour (time & one half), $90.40 per hour (double time).

Overtime Description

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
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 (STEEL ERECTION)

Field Engineer - Steel Erection Party Chief

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $75.53
Supplemental Benefit Rate per Hour: $47.36
Supplemental Note: Overtime benefit rate - $67.22 per hour (time & one half), $87.07 per hour (double time).

Field Engineer - Steel Erection Instrument Person

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $54.68
Supplemental Benefit Rate per Hour: $47.36
Supplemental Note: Overtime benefit rate - $67.22 per hour (time & one half), $87.07 per hour (double time).

Field Engineer - Steel Erection Rodperson

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $34.80
Supplemental Benefit Rate per Hour: $47.36
Supplemental Note: Overtime benefit rate - $67.22 per hour (time & one half), $87.07 per hour (double time).

Field Engineer - Steel Erection Rodperson 1st Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $47.36

Supplemental Note: Overtime benefit rate - $67.22 per hour (time & one half), $87.07 per hour (double time).

Overtime Description
Time and one half the regular rate for Saturday for the first eight hours worked.
Double time the regular rate for Saturday for work performed in excess of eight hours.

Overtime
Time and one half the regular rate after an 8 hour day.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
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
Employees must work at least one (1) 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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $93.74
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $149.98

Operating Engineer - Road & Heavy Construction II

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

Effective Period: 7/1/2025 - 6/30/2026

Wage Rate per Hour: $97.06
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $155.30

Operating Engineer - Road & Heavy Construction III

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $100.18
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $160.29

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $97.75
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $156.40

Operating Engineer - Road & Heavy Construction V

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $95.83
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $153.33

Operating Engineer - Road & Heavy Construction VI

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $91.04
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $145.66

Operating Engineer - Road & Heavy Construction VII

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $73.56
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $117.70

Operating Engineer - Road & Heavy Construction VIII

Utility Compressors

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $57.14
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $71.98

Operating Engineer - Road & Heavy Construction IX

Horizontal Boring Rig

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $86.61
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $138.58

Operating Engineer - Road & Heavy Construction X

Elevators (manually operated as personnel hoist).

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $79.62
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $127.39

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $61.87
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours

Shift Wage Rate: $98.99

Operating Engineer - Road & Heavy Construction XII

All Drills and Machines of a similar nature.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $92.01
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $147.22

Operating Engineer - Road & Heavy Construction XIII

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $89.14
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $142.62

Operating Engineer - Road & Heavy Construction XIV

Concrete Mixer

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $85.21
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $136.34

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $57.52
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $92.03

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $81.38
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $130.21

Operating Engineer - Road & Heavy Construction XVII

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $81.97
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $131.15

Operating Engineer - Road & Heavy Construction XVIII

Tower Crane

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $117.60
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $188.16

Operating Engineer - Paving I

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $91.04
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $145.66

Operating Engineer - Paving II

Asphalt Roller

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $88.72
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $141.95

Operating Engineer - Paving III

Asphalt Plants

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $75.01
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $120.02

Operating Engineer - Concrete I

Cranes

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $97.32
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours

Operating Engineer - Concrete II

Compressors

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $57.96
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours

Operating Engineer - Concrete III

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $77.80
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours

Operating Engineer - Steel Erection I

Three Drum Derricks

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $101.49
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $162.38

Operating Engineer - Steel Erection II

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $97.52
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $156.03

Operating Engineer - Steel Erection III

Compressors, Welding Machines.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $55.28
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $88.45

Operating Engineer - Steel Erection IV

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $52.63
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
Shift Wage Rate: $84.21

Operating Engineer - Building Work I

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

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $72.46
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours

Operating Engineer - Building Work II

Compressors, Welding Machines (Cutting Concrete-Tank Work), Paint Spraying, Sandblasting, Pumps (with the exclusion of Concrete Pumps), All Engines irrespective of Power (Power-Pac) used to drive Auxiliary Equipment, Air, Hydraulic, Jacking System, etc.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $54.12
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours

Operating Engineer - Building Work III

Double Drum

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $92.32
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours

Operating Engineer - Building Work IV

Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $97.79
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours

Operating Engineer - Building Work V

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $80.56
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours

Operating Engineer - Building Work VI

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $79.70
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours

Operating Engineer - Building Work VII

Rack & Pinion and House Cars

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $63.27
Supplemental Benefit Rate per Hour: $38.90
Supplemental Note: $71.50 overtime hours
For New House Car projects Wage Rate per Hour $50.39
For New House Car projects: Supplemental Benefit overtime hours: $71.50

Overtime Description

On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

For House Cars and Rack & Pinion only: Overtime paid at time and one-half for all hours in excess of eight hours in a day, Saturday, Sunday and Holidays worked.

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

When two (2) or more shifts are employed, single time will be paid for each shift.
For Steel Erection Only: Shifts may be worked at the single time rate at other than the regular working hours (8:00 A.M. to 4:30 P.M.) on the following work ONLY: Heavy construction jobs on work below the street level, over railroad tracks and on building jobs.

(Operating Engineer Local #14)

FLAGGER

Flagger to be paid at the rate of the journeyperson or apprentice in the trade performing the underlying work.

In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, this title includes traffic control duty only for City public works contracts and subcontracts solicited on or after July 1, 2024.

On City public works contracts and subcontracts solicited on or after July 1, 2024, traffic control worker to be paid at the rate of the journeyperson or apprentice in the trade performing the underlying work.

If the trade performing the underlying work does not regularly employ a flagger or traffic control worker, then one of the following titles must be used on such projects:
Laborer - Heavy & Highway
Laborer - Paver & Roadbuilder
Laborer - Paver & Roadbuilder Line Striping (Roadway)

FLOOR COVERER

(Interior vinyl composition tile, sheath vinyl linoleum and wood parquet tile including site preparation and synthetic turf not including site preparation)

Floor Coverer

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $59.05
Supplemental Benefit Rate per Hour: $49.08

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving

Day before Christmas
Christmas Day
Day before New Year's Day

Shift Rates

Two shifts may be utilized with the first shift working 8 a.m. to the end of the shift at straight time rate of pay. The wage rate for the second shift consisting of 7 hours shall be paid at 114.29% of straight time wage rate. The wage rate for the second shift consisting of 8 hours shall be paid 112.5% of the straight time wage rate. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

GLAZIER

(New Construction, Remodeling, and Alteration)

Glazier

Effective Period: 7/1/2025 - 10/31/2025
Wage Rate per Hour: $49.20
Supplemental Benefit Rate per Hour: $57.22

Effective Period: 11/1/2025 - 6/30/2026
Wage Rate per Hour: $49.45
Supplemental Benefit Rate per Hour: $58.62

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

(Local #1281)

GLAZIER - REPAIR & MAINTENANCE

(For the Installation of Glass - All repair and maintenance work on a particular building.)

Craft Jurisdiction for repair, maintenance and fabrication

Plate glass replacement, Storm windows and storm doors, Herculite door repairs, Door closer repairs, Glass tinting.

Effective Period: 7/1/2025 - 10/31/2025
Wage Rate per Hour: $27.69
Supplemental Benefit Rate per Hour: $28.43

Effective Period: 11/1/2025 - 6/30/2026
Wage Rate per Hour: $28.32
Supplemental Benefit Rate per Hour: $28.68

Overtime

Time and one half the regular rate after an 8 hour day.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Local #1281)

HAZARDOUS MATERIAL HANDLER

(Removal, abatement, encapsulation or decontamination of asbestos, lead, mold, or other toxic or hazardous waste/materials)

Handler

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $39.95
Supplemental Benefit Rate per Hour: $23.76

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $71.71
Supplemental Benefit Rate per Hour: $36.81

Overtime Description

Supplemental Benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Triple time the regular rate for work on the following holiday(s).
Labor Day

Paid Holidays
None

Shift Rates
The first shift shall work seven hours at the regular straight time rate. The second and third shift shall work seven hours the regular straight time hourly rate plus a fourteen percent wage and benefit premium. There must be a first shift to work the second shift, and a second shift to work the third shift. Off-hour jobs in occupied buildings may be worked on weekdays with an increment of one-dollar ($1.00) per hour and eight (8) hours pay for seven (7) hours worked.

(Local #12) (BCA)

HOUSE WRECKER
(TOTAL DEMOLITION)

House Wrecker - Tier A

On all work sites the first, second, eleventh and every third House Wrecker thereafter will be Tier A House Wreckers (i.e. 1st, 2nd, 11th, 14th etc). Other House Wreckers may be Tier B House Wreckers.

Effective Period: 7/1/2025 - 6/30/2026

Wage Rate per Hour: **$40.00**
Supplemental Benefit Rate per Hour: **$32.40**

House Wrecker - Tier B

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: **$29.23**
Supplemental Benefit Rate per Hour: **$24.81**

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL

Iron Worker - Ornamental

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: **$48.15**
Supplemental Benefit Rate per Hour: **$67.62**
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description
Monday through Friday- the first eight hours are paid at straight time, the 9th and 10th hours are paid at time and one-half the regular rate, all additional weekday overtime is paid at double the regular rate. Saturdays- the first eight hours are paid at time and one-half the regular rate, double time thereafter. Sunday-all shifts are paid at double time. Four Days a week at Ten (10) hours straight time is allowed.

Overtime
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When two or three shifts are employed on a job, Monday through Friday, each shift will be paid eight (8) hours at the straight time rate for eight (8) hours of work; at time and one-half the regular straight time rate for the first two (2) hours of overtime worked beyond eight (8) hours; and at double time for all work thereafter. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, eight (8) hours will be paid at straight time rate for seven (7) hours of work, and all overtime shall be paid at time and one-half the regular straight time rates. On Saturday, Sundays and Holidays, time and one-half the regular straight time rate shall be paid for all work up to seven (7) hours and double time shall be paid for all work thereafter.

(Local #580)

IRON WORKER - STRUCTURAL

Iron Worker - Structural

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $58.95
Supplemental Benefit Rate per Hour: $92.02
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description
Monday through Friday- the first eight hours are paid at straight time, the 9th and 10th hours are paid at time and one-half the regular rate, all additional weekday overtime is paid at double the regular rate. Saturdays- the first eight hours are paid at time and one-half the regular rate, double time thereafter. Sunday-all shifts are paid at double time. Four Days a week at Ten (10) hours straight time is allowed.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates
Monday through Friday - First Shift: First eight hours are paid at straight time, the 9th & 10th hours are paid at time and a half, double time paid thereafter. Second and third Shifts: First eight hours are paid at time and one-half, double time thereafter. Saturdays: All shifts, first eight hours paid at time and one-half, double time thereafter: Sunday all shifts are paid at double time.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday.

(Local #40 & #361)

LABORER – HEAVY & HIGHWAY
(Foundation, Concrete, Excavating, Street Pipe Layer and Common)

Laborer - Heavy & Highway

Excavation and foundation work for buildings, heavy construction, street pipe laying, engineering work, and hazardous waste removal in connection with the above work. Landscaping tasks in connection with heavy construction work, engineering work and building projects. Projects include, but are not limited to pollution plants, sewers, parks, subways, bridges, highways, etc. In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, for City public work contracts and subcontracts solicited on or after July 1, 2024 only, includes traffic control duty associated with such projects.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $45.60
Supplemental Benefit Rate per Hour: $55.73

Overtime Description
Paid Holidays: Labor Day, Thanksgiving Day
No Supplemental Benefits are paid for non-worked holidays.

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

Shift Rates
When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

LABORER - PAVER & ROADBUILDER

Laborer - Paver & Roadbuilder

Paving and road construction work, regardless of material used, including but not limited to preparation of job sites, removal of old surfaces, asphalt and/or concrete, by whatever method, including but not limited to milling; laying of concrete; laying of asphalt for temporary, patchwork, and utility paving (but not production paving); site preparation and incidental work for installation of rubberized materials and similar surfaces; installation and repair of temporary construction fencing; slurry/seal coating, paving stones, maintenance of safety surfaces; play equipment installation, and other related work. In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, for City public work contracts and subcontracts solicited on or after July 1, 2024 only, includes traffic control duty associated with such projects.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $46.33
Supplemental Benefit Rate per Hour: $55.00
Supplemental Note: For time and one half overtime - $59.63 For double overtime - $64.25

Paver & Roadbuilder - Formsetter

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $50.20
Supplemental Benefit Rate per Hour: $55.00
Supplemental Note: For time and one half overtime - $59.63 For double overtime - $64.25

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $46.33
Supplemental Benefit Rate per Hour: $55.00
Supplemental Note: For time and one half overtime - $59.63 For double overtime - $64.25

Production Paver & Roadbuilder - Raker

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $50.20
Supplemental Benefit Rate per Hour: $55.00
Supplemental Note: For time and one half overtime - $59.63 For double overtime - $64.25

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $50.80
Supplemental Benefit Rate per Hour: $55.00
Supplemental Note: For time and one half overtime - $59.63 For double overtime - $64.25

Overtime Description
If an employee works New Year's Day or Christmas Day, they receive the single time rate plus 25%.

For Paid Holidays: Holiday pay for all holidays shall be prorated based two hours per day for each day worked in the holiday week, not to exceed 8 hours of holiday pay.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).

Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day

Paid Holidays

Memorial Day
Independence Day
Labor Day
Thanksgiving Day

Shift Rates

When two shifts are employed, the work period for each shift shall be a continuous eight (8) hours. When three shifts are employed, each shift will work seven and one half (7 ½) hours but will be paid for eight (8) hours at the straight time rate since only one half (1/2) hour is allowed for meal time.
When two or more shifts are employed, single time will be paid for each shift.

(Local #1010)

LABORER - PAVER & ROADBUILDER LINE STRIPING (ROADWAY)

(Road markings, applications of striping and surface coatings on Roadways, Bus lanes, Bike lanes & Pedestrian Plazas)

Striping - Machine Operator (Thermoplastic & Epoxy)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $42.00
Supplemental Benefit Rate per Hour: $21.17
Supplemental Note: For time and one half overtime - $22.87 For double overtime - $24.57

Lineperson - Crew Chief

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $46.00
Supplemental Benefit Rate per Hour: $21.17
Supplemental Note: For time and one half overtime - $22.87 For double overtime - $24.57

Laborer: Striping Assistant - Green Infrastructure - Traffic Control

In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, for City public work contracts and subcontracts solicited on or after July 1, 2024 only, includes traffic control duty associated with such projects.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $40.00
Supplemental Benefit Rate per Hour: $21.17
Supplemental Note: For time and one half overtime - $22.87 For double overtime - $24.57

Overtime Description
For Paid Holidays: Employees will only receive Holiday Pay for holidays not worked if said employee worked both the regularly scheduled workday before and after the holiday.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Vacation
Vacation Employees with one to two years service shall accrue vacation based on hours worked: 250 hours worked - 1 day vacation; 500 hours worked - 2 days vacation; 750 hours worked - 3 days vacation; 900 hours worked - 4 days vacation; 1,000 hours worked - 5 days vacation. Employees with two to five years service receive two weeks vacation. Employees with five to twenty years service receive three weeks vacation. Employees with twenty to twenty-five years service receive four weeks vacation. Employees with 25 or more years service receive five weeks vacation.

(Local #1010)

LANDSCAPING
(Landscaping tasks, such as tree pruning, tree removing and spraying in connection with Green Infrastructure maintenance and the planting of street trees and trees in City parks, but not when such activities are performed as part of construction or reconstruction projects.)

Landscaper (Year 6 and above)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $38.94
Supplemental Benefit Rate per Hour: $18.55

Landscaper (Year 3 - 5)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $37.70
Supplemental Benefit Rate per Hour: $18.55

Landscaper (up to 3 years)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $34.60
Supplemental Benefit Rate per Hour: $18.55

Groundperson

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $34.60
Supplemental Benefit Rate per Hour: $18.55

Tree Remover / Pruner

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $45.17
Supplemental Benefit Rate per Hour: $18.55

Landscaper Sprayer (Pesticide Applicator)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $32.74
Supplemental Benefit Rate per Hour: $18.55

Watering - Plant Maintainer

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $26.50
Supplemental Benefit Rate per Hour: $18.55

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: 7/1/2025 - 7/6/2025
Wage Rate per Hour: $59.21
Supplemental Benefit Rate per Hour: $44.46

Effective Period: 7/7/2025 - 6/30/2026
Wage Rate per Hour: $59.66
Supplemental Benefit Rate per Hour: $44.76

Marble Finisher

Effective Period: 7/1/2025 - 7/6/2025
Wage Rate per Hour: $45.67
Supplemental Benefit Rate per Hour: $41.36

Effective Period: 7/7/2025 - 6/30/2026
Wage Rate per Hour: $45.89
Supplemental Benefit Rate per Hour: $41.66

Marble Polisher

Effective Period: 7/1/2025 - 7/6/2025
Wage Rate per Hour: $44.68
Supplemental Benefit Rate per Hour: $34.31

Effective Period: 7/7/2025 - 6/30/2026
Wage Rate per Hour: $44.95
Supplemental Benefit Rate per Hour: $34.61

Marble Maintenance Finisher

Effective Period: 7/1/2025 - 7/6/2025
Wage Rate per Hour: $27.99
Supplemental Benefit Rate per Hour: $15.44

Effective Period: 7/7/2025 - 6/30/2026
Wage Rate per Hour: $28.15
Supplemental Benefit Rate per Hour: $15.69

Overtime Description
Supplemental Benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #7)

MASON TENDER
Building Laborer

Mason Tender

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $41.80
Supplemental Benefit Rate per Hour: $34.14

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
The employer may work two (2) shifts with the first shift at the straight time wage rate and the second shift receiving eight (8) hours paid for seven (7) hours work at the straight time wage rate. When it is not possible to conduct alteration work during regular working hours in a building occupied by tenants, the rule for the second shift will apply

(Local #79)

MASON TENDER (INTERIOR DEMOLITION WORKER)

Mason Tender Tier A

Tier A Interior Demolition Worker performs all burning, chopping, and other technically skilled tasks related to interior demolition work.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $38.40
Supplemental Benefit Rate per Hour: $26.89

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.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $27.59
Supplemental Benefit Rate per Hour: $21.21

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Local #79)

METALLIC LATHER

Metallic Lather

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $46.50
Supplemental Benefit Rate per Hour: $56.46
Supplemental Note: For time and one half overtime - $68.21 For double overtime - $89.86

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $60.83
Supplemental Benefit Rate per Hour: $59.18

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day

Independence Day
Labor Day
Columbus Day
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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $54.77
Supplemental Benefit Rate per Hour: $48.42

Mosaic Mechanic - Mosaic & Terrazzo Finisher

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $53.17
Supplemental Benefit Rate per Hour: $48.42

Mosaic Mechanic - Machine Operator Grinder

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $53.17
Supplemental Benefit Rate per Hour: $48.42

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #7)

PAINTER

Painter - Brush & Roller

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $44.75
Supplemental Benefit Rate per Hour: $44.13
Supplemental Note: $52.76 on overtime

Spray & Scaffold / Decorative / Sandblast

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $47.75
Supplemental Benefit Rate per Hour: $44.13
Supplemental Note: $52.76 on overtime

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day

Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(District Council of Painters #9)

PAINTER - BRIDGE & STRUCTURAL STEEL

Painters on Structural Steel

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $56.25
Supplemental Benefit Rate per Hour: $55.09

Painter - Power Tool

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $64.70
Supplemental Benefit Rate per Hour: $55.09
Overtime Wage Rate: $7.00 above the "Painters on Structural Steel" overtime rate.

Overtime Description
Supplemental Benefits shall be paid for each hour worked, up to forty (40) hours per week for the period of May 1st to November 15th or up to fifty (50) hours per week for the period of November 16th to April 30th.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Second shift is paid at regular hourly wage rates plus a ten percent (10%) differential. There must be a first shift to work a second shift.

(Local #806)

PAINTER - METAL POLISHER

METAL POLISHER

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $35.00
Supplemental Benefit Rate per Hour: $12.84

METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $35.95
Supplemental Benefit Rate per Hour: $12.84

METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $38.50
Supplemental Benefit Rate per Hour: $12.84

ASSISTANT METAL POLISHER

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $27.19
Supplemental Benefit Rate per Hour: $12.47

ASSISTANT METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $27.94
Supplemental Benefit Rate per Hour: $12.47

ASSISTANT METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $29.69
Supplemental Benefit Rate per Hour: $12.47

Overtime Description
All work performed on Saturdays shall be paid at time-in-a half. The exception being; for suspended scaffold work and work deemed as a construction project; an eight (8) hour shift lost during the week due to circumstances beyond the control of the employer, up to a maximum of eight (8) hours per week, may be worked on Saturday at the straight time rate.

Holiday Pay
Double time the regular rate for work on the following Holiday plus the day's pay. Only employees who have completed one year of service, including any trial period shall be eligible for holiday pay.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Four Days a week at Ten (10) hours straight a day.

Local 8A-28A

PAINTER - SIGN

Sign Painter

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $49.39
Supplemental Benefit Rate per Hour: $29.75

Assistant Sign Painter

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $41.98
Supplemental Benefit Rate per Hour: $29.04

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
Personal Day

Vacation
At least 1 year of employment.....1 week
2 years or more of employment.....2 weeks
8 years or more of employment.....3 weeks

(Local #8A-28A)

PAPERHANGER

Paperhanger

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $48.02

Supplemental Benefit Rate per Hour: $45.56
Supplemental Note: Supplemental benefits are to be paid at the appropriate straight time and overtime rate.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Evening shift - 4:30 P.M. to 12:00 Midnight (regular rate of pay); any work performed before 7:00 A.M. shall be at time and one half the regular base rate of pay.

(District Council of Painters #9)

PLASTERER

Plasterer

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $52.99
Supplemental Benefit Rate per Hour: $26.10

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When it is not possible to conduct work during regular working hours (between 6:30am and 4:30pm), a shift differential shall be paid at the regular hourly rate plus a twelve percent (12%) per hour differential. Workers on shift work shall be allowed a paid one-half hour meal break.

(Local #262)

PLASTERER - TENDER

Plasterer - Tender

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $41.80
Supplemental Benefit Rate per Hour: $34.14

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When work commences outside regular work hours, workers receive an hour additional (differential) wage and supplement payment. Eight hours pay for seven hours work or nine hours pay for eight hours work.

(Mason Tenders District Council)

PLUMBER

Plumber

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $76.30
Supplemental Benefit Rate per Hour: $45.15
Supplemental Note: Double time shall be paid for supplemental benefits during overtime work.

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $61.12
Supplemental Benefit Rate per Hour: $36.04
Supplemental Note: Double time shall be paid for supplemental benefits during overtime work.

Overtime Description
Where the plumbing contract price is one and one half million dollars ($1,500,000.00) or less, double time the regular rate after an 8 hour day.

Overtime
Double time the regular rate after a 7 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day

Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Shift work, when directly specified in public agency or authority contract documents, and continues for a period of not less than ten (10) consecutive work days. A shift shall consist of seven (7) hours with one-half (1/2) hour for lunch after the first four (4) hours of each shift. A premium of thirty percent (30%) for wages and supplemental benefits on shift work performed Monday through Friday on the 4 P.M. and midnight shifts. For shift work performed on weekends the shift premium shall be fifty percent (50%) of wages and supplemental benefits. For shift work performed on holidays designated below, double time wages and supplemental benefits shall be paid. Also noted that the normal workday Monday through Friday 8:00 A.M. to 3:30 P.M. is not considered shift work, and therefore not subject to shift premium.

(Plumbers Local #1)

PLUMBER (MECHNICAL EQUIPMENT AND SERVICE)

Mechanical Equipment and Service work is any repair and/or replacement of the present plumbing system that does not change existing roughing or water supply lines. Projects regardless of work type which have approved plans and specifications wherein the plumbing exceeds $725,000 are excluded.

Plumber

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $48.90
Supplemental Benefit Rate per Hour: $22.26

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Thanksgiving Day
Day after Thanksgiving

Christmas Day

Paid Holidays
None

(Plumbers Local # 1)

PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME CONSTRUCTION)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $53.02
Supplemental Benefit Rate per Hour: $32.33

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Shift work, when directly specified in public agency or authority contract documents, and continues for a period of not less than ten (10) consecutive work days. A shift shall consist of seven (7) hours with one-half (1/2) hour for lunch after the first four (4) hours of each shift. A premium of thirty percent (30%) for wages and supplemental benefits on shift work performed Monday through Friday on the 4 P.M. and midnight shifts. For shift work performed on weekends the shift premium shall be fifty percent (50%) of wages and supplemental benefits. For shift work performed on holidays designated below, double time wages and supplemental benefits shall be paid. Also noted that the normal workday Monday through Friday 8:00 A.M. to 3:30 P.M. is not considered shift work, and therefore not subject to shift premium.

(Plumbers Local #1)

PLUMBER: PUMP & TANK

Oil Trades (Installation and Maintenance)

Plumber - Pump & Tank

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $74.00
Supplemental Benefit Rate per Hour: $34.31

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
Election Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

All work outside the regular workday (8:00 A.M. to 4:30 P.M.) is to be paid at time and one half the regular hourly rate

(Plumbers Local #1)

POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER

(Exterior Building Renovation)

Journeyperson

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $65.33
Supplemental Benefit Rate per Hour: $32.35

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

All work outside the regular work day (an eight hour workday between the hours of 6:00 A.M. and 4:00 P.M.) is to be paid at time and one half the regular rate. However, the employer may establish one (1) or two (2) shifts starting at or after 4:00 P.M. to be paid at the regular hourly rate plus a 10% differential. For projects bid and performed after July 1, 2023, the first shift shall be paid at the regular hourly rate plus a 5% differential.

(Bricklayer District Council)

ROOFER

Roofer

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $50.25
Supplemental Benefit Rate per Hour: $39.53

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Second shift - Regular hourly rate plus a 10% differential. Third shift - Regular hourly rate plus a 15% differential. There must be a first shift to work the second shift, and a second shift to work the third shift. All other work outside the regular work day (an eight hour workday between the hours of 5:00 A.M. and 4:00 P.M.) is to be paid at time and one half the regular rate.

(Local #8)

SHEET METAL WORKER

Sheet Metal Worker

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $54.60
Supplemental Benefit Rate per Hour: $60.18
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Sheet Metal Worker - Fan Maintenance

(The temporary operation of fans or blowers in new or existing buildings for heating and/or ventilation, and/or air conditioning prior to the completion of the project.)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $43.68
Supplemental Benefit Rate per Hour: $60.18

Sheet Metal Worker - Duct Cleaner

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $19.84
Supplemental Benefit Rate per Hour: $13.08

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Work that can only be performed outside regular working hours (eight hours of work between 7:30 A.M. and 3:30 P.M.) - First shift (work between 3:30 P.M. and 11:30 P.M.) - 10% differential above the established hourly rate. Second shift (work between 11:30 P.M. and 7:30 A.M.) - 15% differential above the established hourly rate.

For Fan Maintenance: On all full shifts of fan maintenance work the straight time hourly rate of pay will be paid for each shift, including nights, Saturdays, Sundays, and holidays.

(Local #28)

SHEET METAL WORKER - SPECIALTY
(Decking & Siding)

Sheet Metal Specialty Worker

The first worker to perform this work must be paid at the rate of the Sheet Metal Worker. The second and third workers shall be paid the Specialty Worker Rate. The ratio of One Sheet Metal Worker, then Two Specialty Workers shall be utilized thereafter.

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $50.50
Supplemental Benefit Rate per Hour: $31.26
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Local #28)

SHIPYARD WORKER

Shipyard Mechanic - First Class

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $32.63
Supplemental Benefit Rate per Hour: $3.40

Shipyard Mechanic - Second Class

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $22.91
Supplemental Benefit Rate per Hour: $2.12

Shipyard Laborer - First Class

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $26.83
Supplemental Benefit Rate per Hour: $3.55

Shipyard Laborer - Second Class

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $19.02
Supplemental Benefit Rate per Hour: $2.68

Shipyard Dockhand - First Class

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $25.76
Supplemental Benefit Rate per Hour: $3.59

Shipyard Dockhand - Second Class

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $20.14
Supplemental Benefit Rate per Hour: $3.34

Overtime Description

Work performed on holiday is paid double time the regular hourly wage rate plus holiday pay.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day

Day after Thanksgiving
Christmas Day

Based on Survey Data

SIGN ERECTOR
(Sheet Metal, Plastic, Electric, and Neon)

Sign Erector

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $58.00
Supplemental Benefit Rate per Hour: $63.44

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Time and one half the regular hourly rate is to be paid for all hours worked outside the regular workday either (7:00 A.M. through 2:30 P.M.) or (8:00 A.M. through 3:30 P.M.)

(Local #137)

STEAMFITTER

Steamfitter

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $61.80
Supplemental Benefit Rate per Hour: $61.89
Supplemental Note: Overtime supplemental benefit rate: $123.04

Steamfitter -Temporary Services

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $46.97
Supplemental Benefit Rate per Hour: $50.22

Overtime Description
Double time after a 7 hour day except for Temporary Services.

Overtime
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
May be performed outside of the regular workday except Saturday, Sunday and Holidays. When shift work is performed the wage rate for regular time worked is a 15% percent premium on wage and 15% percent premium on supplemental benefits.

Local 638

STEAMFITTER - REFRIGERATION AND AIR CONDITIONER

(Maintenance and Installation Service Person)

Refrigeration and Air Conditioner Mechanic

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $46.10
Supplemental Benefit Rate per Hour: $21.96

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Christmas Day

Double time and one half the regular rate for work on the following holiday(s).
Martin Luther King Jr. Day
President's Day
Memorial Day
Columbus Day

Paid Holidays

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

(Local #638-B)

STONE MASON - SETTER

Stone Mason - Setter

(Assisted by Derrickperson and Rigger)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $59.47
Supplemental Benefit Rate per Hour: $56.67

Overtime Description
Monday through Friday: Time and one quarter after seven hours worked. Time and one half after eight hours worked. Double time after 9 hours worked.
Saturday: Time and one half for the first nine hours worked. Double time after 9 hours worked.
Sunday and Holiday: double time for all hours worked.
Site Work: (paving and base course) paid at straight time for the first eight hours.

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
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

Shift Rates
For all hours worked outside 8:00 am to 3:30 pm shall be paid double time unless flex band hours and/or site work are in use.

(Bricklayers District Council)

TAPER

Drywall Taper

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $48.47
Supplemental Benefit Rate per Hour: $35.91

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Columbus Day
Thanksgiving Day
Day before Christmas
Christmas Day
Day before New Year's Day

Paid Holidays
Labor Day

(Local #1974)

TELECOMMUNICATION WORKER
(Install/maintain/repair telecommunications cables carrying data, video, and/or voice except for installation on building construction/alteration/renovation projects.)

Telecommunication Worker

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $47.03
Supplemental Benefit Rate per Hour: $23.15
Supplemental Note: The above rate applies for Manhattan, Bronx, Brooklyn, Queens. $22.84 for Staten Island only.

Overtime
Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees have the option of observing either Martin Luther King's Birthday or the day after Thanksgiving instead of Lincoln's Birthday

Shift Rates

For any workday that starts before 8A.M. or ends after 6P.M. there is a 10% differential for the applicable worker's hourly rate.

Vacation

After 6 months.....one week.
After 12 months but less than 7 years.....two weeks.
After 7 or more but less than 15 years.....three weeks.
After 15 years or more but less than 25 years.....four weeks.

(C.W.A.)

TILE FINISHER

Tile Finisher

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $50.11
Supplemental Benefit Rate per Hour: $33.61

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
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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $65.03
Supplemental Benefit Rate per Hour: $37.11

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
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TIMBERPERSON

Timberperson

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $56.59
Supplemental Benefit Rate per Hour: $56.41

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day

Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate. Benefits for off-shift work shall be paid at the straight time rate.

(Local #1556)

TUNNEL WORKER

Blasters, Mucking Machine Operators (Compressed Air Rates)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $75.14
Supplemental Benefit Rate per Hour: $66.51

Tunnel Workers (Compressed Air Rates)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $72.46
Supplemental Benefit Rate per Hour: $64.41

Top Nipper (Compressed Air Rates)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $71.24
Supplemental Benefit Rate per Hour: $63.14

Outside Lock Tender, Outside Gauge Tender,Muck Lock Tender (Compressed Air Rates)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $69.83
Supplemental Benefit Rate per Hour: $62.11

Bottom Bell & Top Bell Signal Person: Shaft Person (Compressed Air Rates)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $69.83
Supplemental Benefit Rate per Hour: $62.11

Changehouse Attendant: Powder Watchperson (Compressed Air Rates)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $61.57
Supplemental Benefit Rate per Hour: $58.18

Blasters (Free Air Rates)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $71.69
Supplemental Benefit Rate per Hour: $63.84

Tunnel Workers (Free Air Rates)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $68.58
Supplemental Benefit Rate per Hour: $61.18

All Others (Free Air Rates)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $63.40
Supplemental Benefit Rate per Hour: $56.62

Microtunneling (Free Air Rates)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $54.86
Supplemental Benefit Rate per Hour: $48.95

Overtime Description

For work performed during excavation and primary concrete tunnel lining phases - Double time the regular rate after an 8 hour day and Saturday, Sunday and on the following holiday(s) listed below.
For Repair-Maintenance Work on Existing Equipment and Facilities - Time and one half the regular rate after a 8 hour day, Saturday, Sunday and double time the regular rate for work on the following holiday(s) listed below.
For Small-Bore Micro Tunneling Machines - Time and one-half the regular rate shall be paid for all overtime.
For work not listed above - Time and one half the regular rate after an 8 hour day and Saturday and double time the regular rate on Sunday and on the following holiday(s) listed below.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day

President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

(Local #147)

UTILITY LOCATOR

(Locate & mark underground utilities including gas for street excavation and utility line repairs)

Utility Locator (Year 7 and above)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $35.50
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 5 Second 6 months & Year 6)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $35.50
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 5 first 6 months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $34.80
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 4)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $31.54
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 3)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $28.28
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 2)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $25.02
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 1)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $21.76
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Up to 1 year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $18.50
Supplemental Benefit Rate per Hour: $1.43
Supplemental Note: No benefits for the first 90 days of employment.

Overtime

Time and one half the regular rate for work on the following holiday(s).
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays

New Year's Day
Memorial Day
Independence Day
Thanksgiving Day
Christmas Day

Shift Rates

10% shift differential to employees working any shift starting between noon and 5 AM.

Vacation

For up to 1 year 0 hours
For year 1 - 2 48 hours per year
For year 3 - 9 96 hours per year
For year 10 or more 144 hours per year

Sick Days:
For up to 1 year employee receives 40 hours paid sick leave.
For year 1 employee earns 2 hours of paid sick leave for every 100 overtime hours worked.
For year 2 - 9 years employee earns 4 hours of paid sick leave for every 100 overtime hours worked.
For year 10 or more employee earns 6 hours of paid sick leave for every 100 overtime hours worked.

(C.W.A.)

WELDER

WELDER AND FIREWATCH TO BE PAID AT THE RATE OF THE JOURNEYPERSON OR REGISTERED APPRENTICE IN THE TRADE PERFORMING THE WORK.

OFFICE OF THE COMPTROLLER

CITY OF NEW YORK

CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Pursuant to Labor Law § 220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant and registered with the New York State Department of Labor, may be paid at the apprentice rates in this schedule. Apprentices who are not so registered must be paid as journey persons in accordance with the trade classification of the work they actually performed.

Apprentice ratios are established to ensure the proper safety, training and supervision of apprentices. A ratio establishes the number of journey workers required for each apprentice in a program and on a job site. Ratios are interpreted as follows: in the case of a 1:1, 1:4 ratio, there must be one journey worker for the first apprentice, and four additional journey workers for each subsequent apprentice.

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BOILERMAKER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Boilermaker (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $35.27

Boilermaker (Second Year: 1st Six Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $37.34

Boilermaker (Second Year: 2nd Six Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $39.44

Boilermaker (Third Year: 1st Six Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $41.50

Boilermaker (Third Year: 2nd Six Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 85% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $43.59

Boilermaker (Fourth Year: 1st Six Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $45.68

Boilermaker (Fourth Year: 2nd Six Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $47.76

(Local #5)

BRICKLAYER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Bricklayer (First 650 Hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $29.65

Bricklayer (Second 650 Hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $29.65

Bricklayer (Third 650 Hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $29.65

Bricklayer (Fourth 650 Hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $29.65

Bricklayer (Fifth 650 Hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $29.65

Bricklayer (Last 750 Hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $29.65

(Bricklayer District Council)

CARPENTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Carpenter (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour For Building Apprentice: $24.20
Supplemental Benefit Rate Per Hour For Building Apprentice: $18.45

Wage Rate Per Hour For Heavy Apprentice: $27.98
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $38.89

Carpenter (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour For Building Apprentice: $27.20
Supplemental Benefit Rate Per Hour For Building Apprentice: $19.95

Wage Rate Per Hour For Heavy Apprentice: $33.58
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $38.89

Carpenter (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour For Building Apprentice: $31.45
Supplemental Benefit Rate Per Hour For Building Apprentice: $23.55

Wage Rate Per Hour For Heavy Apprentice: $41.96
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $38.89

Carpenter (Fourth Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour For Building Apprentice: $39.33
Supplemental Benefit Rate Per Hour For Building Apprentice: $25.55

Wage Rate Per Hour For Heavy Apprentice: $50.35
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $38.89

(Carpenters District Council)

CARPENTER - HIGH RISE CONCRETE FORMS

(Ratio of Apprentice to Journeyperson: 1 to 1, 2 to 5)

Carpenter - High Rise (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $18.27
Supplemental Benefit Rate per Hour: $17.55

Carpenter - High Rise (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $24.70
Supplemental Benefit Rate per Hour: $17.68

Carpenter - High Rise (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $31.28
Supplemental Benefit Rate per Hour: $17.81

Carpenter - High Rise (Fourth Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $38.90
Supplemental Benefit Rate per Hour: $17.96

(Carpenters District Council)

CEMENT AND CONCRETE WORKER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Cement & Concrete Worker (First 1333 hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 53% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $17.97

Cement & Concrete Worker (Second 1333 hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 69% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.41

Cement & Concrete Worker (Last 1334 hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 85% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $24.85

(Cement Concrete Workers District Council)

CEMENT MASON

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cement Mason (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $23.77
Supplemental Benefit Rate per Hour: $14.86

Cement Mason (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $28.74
Supplemental Benefit Rate per Hour: $15.16

Cement Mason (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $34.27
Supplemental Benefit Rate per Hour: $15.27

(Local #780)

DERRICKPERSON & RIGGER (STONE)

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Derrickperson & Rigger (stone) - First Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: 50% of Journeyperson's rate

Derrickperson & Rigger (stone) - Second Year: 1st Six Months

Effective Period: 7/1/2025 - 6/30/2026
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: 7/1/2025 - 6/30/2026
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: 7/1/2025 - 6/30/2026
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: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: $27.98
Supplemental Benefit Rate Per Hour: $38.89

Dockbuilder/Pile Driver (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: $33.58
Supplemental Benefit Rate Per Hour: $38.89

Dockbuilder/Pile Driver (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: $41.96
Supplemental Benefit Rate Per Hour: $38.89

Dockbuilder/Pile Driver (Fourth Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: $50.35
Supplemental Benefit Rate Per Hour: $38.89

(Carpenters District Council)

ELECTRICIAN

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Electrician 1st year

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $18.50
Supplemental Benefit Rate per Hour: $18.94
Overtime Supplemental Rate Per Hour: $20.17

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $19.25
Supplemental Benefit Rate per Hour: $19.84
Overtime Supplemental Rate Per Hour: $21.11

Electrician 2nd Year

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $20.50
Supplemental Benefit Rate per Hour: $19.99
Overtime Supplemental Rate Per Hour: $21.35

Effective Period: 4/16/2026 - 6/30/2026

Wage Rate per Hour: $21.25
Supplemental Benefit Rate per Hour: $20.88
Overtime Supplemental Rate Per Hour: $22.29

Electrician 3rd Year

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $22.50
Supplemental Benefit Rate per Hour: $21.04
Overtime Supplemental Rate Per Hour: $22.53

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $23.25
Supplemental Benefit Rate per Hour: $21.93
Overtime Supplemental Rate Per Hour: $23.48

Electrician 4th Year

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $25.50
Supplemental Benefit Rate per Hour: $22.61
Overtime Supplemental Rate Per Hour: $24.30

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $26.25
Supplemental Benefit Rate per Hour: $23.50
Overtime Supplemental Rate Per Hour: $25.25

Electrician 5th Term (0-12 Months)

MIJ 1

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $26.29
Overtime Supplemental Rate Per Hour: $28.02

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $26.79
Overtime Supplemental Rate Per Hour: $28.52

Electrician 5th Term (13-18 Months)

MIJ 2

Effective Period: 7/1/2025 - 4/15/2026
Wage Rate per Hour: $33.50

Supplemental Benefit Rate per Hour: $29.51
Overtime Supplemental Rate Per Hour: $31.63

Effective Period: 4/16/2026 - 6/30/2026
Wage Rate per Hour: $33.50
Supplemental Benefit Rate per Hour: $30.01
Overtime Supplemental Rate Per Hour: $32.13

Overtime Description
Overtime Wage paid at time and one half the regular rate

(Local #3)

ELEVATOR CONSTRUCTOR
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator (Constructor) - First Year

Effective Period: 7/1/2025 - 3/16/2026
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $35.48

Effective Period: 3/17/2026 - 6/30/2026
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $36.18

Elevator (Constructor) - Second Year

Effective Period: 7/1/2025 - 3/16/2026
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $36.16

Effective Period: 3/17/2026 - 6/30/2026
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $36.90

Elevator (Constructor) - Third Year

Effective Period: 7/1/2025 - 3/16/2026
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $37.53

Effective Period: 3/17/2026 - 6/30/2026

Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $38.35

Elevator (Constructor) - Fourth Year

Effective Period: 7/1/2025 - 3/16/2026
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $38.90

Effective Period: 3/17/2026 - 6/30/2026
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $39.80

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator Service/Modernization Mechanic (First Year)

Effective Period: 7/1/2025 - 3/16/2026
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Per Hour: $35.45

Effective Period: 3/17/2026 - 6/30/2026
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Per Hour: $36.15

Elevator Service/Modernization Mechanic (Second Year)

Effective Period: 7/1/2025 - 3/16/2026
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Benefit Per Hour: $36.13

Effective Period: 3/17/2026 - 6/30/2026
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Benefit Per Hour: $36.87

Elevator Service/Modernization Mechanic (Third Year)

Effective Period: 7/1/2025 - 3/16/2026
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Per Hour: $37.50

Effective Period: 3/17/2026 - 6/30/2026
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Per Hour: $38.32

Elevator Service/Modernization Mechanic (Fourth Year)

Effective Period: 7/1/2025 - 3/16/2026
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Per Hour: $38.86

Effective Period: 3/17/2026 - 6/30/2026
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Per Hour: $39.76

(Local #1)

ENGINEER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Engineer - First Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $28.68
Supplemental Benefit Rate per Hour: $35.26

Engineer - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $35.85
Supplemental Benefit Rate per Hour: $35.26

Engineer - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $39.44
Supplemental Benefit Rate per Hour: $35.26

Engineer - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $43.02
Supplemental Benefit Rate per Hour: $35.26

(Local #15)

ENGINEER - OPERATING

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Operating Engineer - First Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 40% of Operating Engineer - Road & Heavy Construction V's Rate
Supplemental Benefit Per Hour: $28.40

Operating Engineer - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 50% of Operating Engineer - Road & Heavy Construction V's Rate
Supplemental Benefit Per Hour: $28.40

Operating Engineer - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 60% of Operating Engineer - Road & Heavy Construction V's Rate
Supplemental Benefit Per Hour: $28.40

(Local #14)

FLOOR COVERER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Floor Coverer (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $26.54
Supplemental Benefit Rate per Hour: $18.04

Floor Coverer (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $29.60
Supplemental Benefit Rate per Hour: $19.69

Floor Coverer (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $34.05
Supplemental Benefit Rate per Hour: $23.49

Floor Coverer (Fourth Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $42.40
Supplemental Benefit Rate per Hour: $25.49

(Carpenters District Council)

GLAZIER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Glazier (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Glazier (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Glazier (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Glazier (Fourth Year)

Effective Period: 7/1/2025 - 6/30/2026

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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $20.76
Supplemental Benefit Rate per Hour: $17.04

Handler (Second 1000 Hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $21.76
Supplemental Benefit Rate per Hour: $17.04

Handler (Third 1000 Hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $24.76
Supplemental Benefit Rate per Hour: $17.04

Handler (Fourth 1000 Hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $26.76
Supplemental Benefit Rate per Hour: $17.04

(Local #78)

HEAT & FROST INSULATOR

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Heat & Frost Insulator (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 45% of Journeyperson's rate

Heat & Frost Insulator (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Heat & Frost Insulator (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Heat & Frost Insulator (Fourth Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

(Local #12)

HOUSE WRECKER
(TOTAL DEMOLITION)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

House Wrecker - First Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $21.75
Supplemental Benefit Rate per Hour: $12.12

House Wrecker - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $23.50
Supplemental Benefit Rate per Hour: $12.12

House Wrecker - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $12.12

House Wrecker - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $12.12

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Iron Worker (Ornamental) - First Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $25.98
Supplemental Benefit Rate per Hour: $15.99

Iron Worker (Ornamental) - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $28.45
Supplemental Benefit Rate per Hour: $17.99

Iron Worker (Ornamental) - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $30.80
Supplemental Benefit Rate per Hour: $18.99

Iron Worker (Ornamental) - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $34.39
Supplemental Benefit Rate per Hour: $20.99

(Local #580)

IRON WORKER - STRUCTURAL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Iron Worker (Structural) - 1st Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $30.61
Supplemental Benefit Rate per Hour: $63.80

Iron Worker (Structural) - 7- 18 Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $31.21
Supplemental Benefit Rate per Hour: $63.80

Iron Worker (Structural) - 19 - 36 months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $31.82
Supplemental Benefit Rate per Hour: $63.80

(Local #40 and #361)

LABORER - HEAVY & HIGHWAY

(Ratio Apprentice to Journeyperson: 1 to 1, 1 to 3)

Laborer - Heavy & Highway - First 1000 hours

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $55.73

Laborer - Heavy & Highway - Second 1000 hours

Effective Period: 7/1/2025 - 6/30/2026

Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: 55.73

Laborer - Heavy & Highway - Third 1000 hours

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: 55.73

Laborer - Heavy & Highway - Fourth 1000 hours

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Rate Per Hour: $55.73

(Local #731)

LABORER - PAVER & ROADBUILDER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Paver and Roadbuilder - First Year (Minimum 1000 hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $32.21
Supplemental Benefit Rate per Hour: $27.82

Paver and Roadbuilder - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $33.85
Supplemental Benefit Rate per Hour: $27.82

(Local#1010)

LABORER - PAVER AND ROADBUILDER - LINE STRIPING (ROADWAY)

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Paver and Roadbuilder - Line Striping (Roadway) - First Year (Minimum 1000 hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $31.36
Supplemental Benefit Rate per Hour: $19.27

Paver and Roadbuilder - Line Striping (Roadway) - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $33.00
Supplemental Benefit Rate per Hour: $19.27

(Local #1010)

MARBLE MECHANICS

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cutters & Setters - 0-3000 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Cutters & Setters - 3001-3750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Cutters & Setters - 3751-4500 Hours

Effective Period: 7/1/2025 - 6/30/2026

Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Cutters & Setters - 4501-5250 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

Cutters & Setters - 5251-6000 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Cutters & Setters - 6001-7500 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

Polishers & Finishers - First 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Polishers & Finishers - Second 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Polishers & Finishers - Third 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Polishers & Finishers - Fourth 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Polishers & Finishers Last 700 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 85% 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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $21.75
Supplemental Benefit Rate per Hour: $11.62

Mason Tender - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $23.50
Supplemental Benefit Rate per Hour: $11.62

Mason Tender - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $11.62

Mason Tender - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $11.62

(Local #79)

MASON TENDER (INTERIOR DEMOLITION WORKER)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Mason Tender (Interior Demolition) - First Year

Effective Period: 7/1/2025 - 6/30/2026

Wage Rate per Hour: **$21.75**
Supplemental Benefit Rate per Hour: **$11.27**

Mason Tender (Interior Demolition) - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: **$23.50**
Supplemental Benefit Rate per Hour: **$11.27**

Mason Tender (Interior Demolition) - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: **$25.00**
Supplemental Benefit Rate per Hour: **$11.27**

Mason Tender (Interior Demolition) - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: **$27.50**
Supplemental Benefit Rate per Hour: **$11.27**

(Local #79)

METALLIC LATHER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metallic Lather (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: **$22.55**
Supplemental Benefit Rate per Hour: **$17.87**

Metallic Lather (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: **$25.00**
Supplemental Benefit Rate per Hour: **$17.92**

Metallic Lather (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $28.00
Supplemental Benefit Rate per Hour: $16.92

Metallic Lather (Fourth Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $30.00
Supplemental Benefit Rate per Hour: $16.92

(Local #46)

MILLWRIGHT
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Millwright (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $32.74
Supplemental Benefit Rate per Hour: $38.29

Millwright (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $38.39
Supplemental Benefit Rate per Hour: $41.99

Millwright (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $44.04
Supplemental Benefit Rate per Hour: $46.34

Millwright (Fourth Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $55.34
Supplemental Benefit Rate per Hour: $53.10

(Local #740)

PAINTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Brush & Roller - First Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $17.90
Supplemental Benefit Rate per Hour: $19.64

Painter - Brush & Roller - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $22.38
Supplemental Benefit Rate per Hour: $25.19

Painter - Brush & Roller - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $26.85
Supplemental Benefit Rate per Hour: $29.72

Painter - Brush & Roller - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $35.80
Supplemental Benefit Rate per Hour: $38.54

(District Council of Painters)

PAINTER - BRIDGE & STRUCTURAL STEEL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Bridge & Structural Steel (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Painter - Bridge & Structural Steel (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Painter - Bridge & Structural Steel (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #806)

PAINTER - METAL POLISHER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metal Polisher (First Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $20.17
Supplemental Benefit Rate per Hour: $8.91
New Construction - Wage Rate Per Hour: $20.56
Scaffold Over 34 Feet - Wage Rate Per Hour: $22.67

Metal Polisher (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $22.18
Supplemental Benefit Rate per Hour: $8.91
New Construction - Wage Rate Per Hour: $22.62
Scaffold Over 34 Feet - Wage Rate Per Hour: $24.68

Metal Polisher (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $24.20
Supplemental Benefit Rate per Hour: $8.91
New Construction - Wage Rate Per Hour: $24.74
Scaffold Over 34 Feet - Wage Rate Per Hour: $26.70

(Local 8A-28)

PLASTERER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)
(Each Term is 800 Hours.)

Plasterer - First Term

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $17.48

Plasterer - Second Term

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $18.63

Plasterer - Third Term

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $20.93

Plasterer - Fourth Term

Effective Period: 7/1/2025 - 6/30/2026
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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $21.75
Supplemental Benefit Rate per Hour: $11.62

Plasterer Tender - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $23.50
Supplemental Benefit Rate per Hour: $11.62

Plasterer Tender - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $11.62

Plasterer Tender - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $11.62

(Local #79)

PLUMBER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plumber - First Year: 1st Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $19.00
Supplemental Benefit Rate per Hour: $5.43

Plumber - First Year: 2nd Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $21.00
Supplemental Benefit Rate per Hour: $6.43

Plumber - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $30.90
Supplemental Benefit Rate per Hour: $23.81

Plumber - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $33.00
Supplemental Benefit Rate per Hour: $23.81

Plumber - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $35.85
Supplemental Benefit Rate per Hour: $23.81

Plumber - Fifth Year: 1st Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $37.25
Supplemental Benefit Rate per Hour: $23.81

Plumber - Fifth Year: 2nd Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $49.32
Supplemental Benefit Rate per Hour: $23.81

(Plumbers Local #1)

POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER

(Exterior Building Renovation)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - First Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $33.58
Supplemental Benefit Rate per Hour: $15.65

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $38.04
Supplemental Benefit Rate per Hour: $21.00

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $44.19
Supplemental Benefit Rate per Hour: $24.75

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $53.10
Supplemental Benefit Rate per Hour: $25.75

(Bricklayer District Council)

ROOFER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Roofer - First Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 38% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $7.86

Roofer - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $18.16

Roofer - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $20.10

Roofer - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.98

Roofer - Fifth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $29.82

(Local #8)

SHEET METAL WORKER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Sheet Metal Worker (0-6 Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $18.97
Supplemental Benefit Rate per Hour: $8.09

Sheet Metal Worker (7-18 Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $18.97
Supplemental Benefit Rate per Hour: $22.10

Sheet Metal Worker (19-30 Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $24.45
Supplemental Benefit Rate per Hour: $29.88

Sheet Metal Worker (31-36 Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $29.95
Supplemental Benefit Rate per Hour: $35.37

Sheet Metal Worker (37-42 Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $29.95
Supplemental Benefit Rate per Hour: $35.37

Sheet Metal Worker (43-48 Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $38.19
Supplemental Benefit Rate per Hour: $43.64

Sheet Metal Worker (49-54 Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $38.19
Supplemental Benefit Rate per Hour: $43.64

Sheet Metal Worker (55-60 Months)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $43.66
Supplemental Benefit Rate per Hour: $49.16

(Local #28)

SIGN ERECTOR

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Sign Erector - First Year: 1st Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 35% of Journeyperson's rate
Supplemental Rate Per Hour: $17.84

Sign Erector - First Year: 2nd Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: $20.25

Sign Erector - Second Year: 1st Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: $22.66

Sign Erector - Second Year: 2nd Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $25.09

Sign Erector - Third Year: 1st Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $33.83

Sign Erector - Third Year: 2nd Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $36.81

Sign Erector - Fourth Year: 1st Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $40.63

Sign Erector - Fourth Year: 2nd Six Months

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $43.70

Sign Erector - Fifth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $46.76

Sign Erector - Sixth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $49.80

(Local #137)

STEAMFITTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Steamfitter - First Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate and Supplemental Per Hour: 40% of Journeyperson's rate

Steamfitter - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate and Supplemental Rate Per Hour: 50% of Journeyperson's rate.

Steamfitter - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate and Supplemental Rate per Hour: 60% of Journeyperson's rate.

Steamfitter - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate and Supplemental Rate Per Hour: 70% of Journeyperson's rate.

Steamfitter - Fifth Year

Effective Period: 7/1/2025 - 6/30/2026
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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $22.31
Supplemental Benefit Rate per Hour: $14.47

Refrigeration & Air Conditioner (Second Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $26.94
Supplemental Benefit Rate per Hour: $15.91

Refrigeration & Air Conditioner (Third Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $31.38
Supplemental Benefit Rate per Hour: $17.41

Refrigeration & Air Conditioner (Fourth Year)

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $37.90
Supplemental Benefit Rate per Hour: $19.44

(Local #638-B)

STONE MASON - SETTER

(Ratio Apprentice of Journeyperson: 1 to 1, 1 to 2)

Stone Mason - Setters - First 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Stone Mason - Setters - Second 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Third 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Stone Mason - Setters - Fourth 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

Stone Mason - Setters - Fifth 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

Stone Mason - Setters - Sixth 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 90% 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: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $22.51
Supplemental Benefit Rate per Hour: $14.65

Drywall Taper - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $24.24
Supplemental Benefit Rate per Hour: $25.28

Drywall Taper - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $29.08
Supplemental Benefit Rate per Hour: $27.41

Drywall Taper - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate per Hour: $38.78
Supplemental Benefit Rate per Hour: $31.66

(Local #1974)

TILE LAYER - SETTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Tile Layer - Setter - First 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour:35% of Journeyperson's rate

Tile Layer - Setter - Second 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour 40% of Journeyperson's rate

Tile Layer - Setter - Third 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Tile Layer - Setter - Fourth 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Tile Layer - Setter - Fifth 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Tile Layer - Setter - Sixth 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Tile Layer - Setter - Seventh 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

Tile Layer - Setter - Eighth 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Tile Layer - Setter - Ninth 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour:80% of Journeyperson's rate

Tile Layer - Setter - Tenth 750 Hours

Effective Period: 7/1/2025 - 6/30/2026
Wage and Supplemental Rate Per Hour: 90% of Journeyperson's rate

(Local #7)

TIMBERPERSON

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Timberperson - First Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: $25.96
Supplemental Rate Per Hour: $38.69

Timberperson - Second Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: $31.07
Supplemental Rate Per Hour: $38.69

Timberperson - Third Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: $38.72
Supplemental Rate Per Hour: $38.69

Timberperson - Fourth Year

Effective Period: 7/1/2025 - 6/30/2026
Wage Rate Per Hour: $46.38
Supplemental Rate Per Hour: $38.69

(Local #1536)

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

Leonard A. Mancusi
SENIOR ASSISTANT COMPTROLLER

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

THE CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
BUREAU OF LABOR LAW
1 CENTRE STREET
NEW YORK, NY 10007

BRAD LANDER
COMPTROLLER

COMPTROLLER'S PREVAILING WAGE MEMORANDUM REGARDING FLAG PERSONS

June 1, 2024

This memorandum supersedes and replaces the Comptroller's Prevailing Wage Memoranda dated May 21, 1998 and related clarification dated March 13, 2001 concerning Flag Persons. This memorandum sets forth the superseding determination of the New York City Comptroller concerning the applicability of Article 8, Section 220 of the New York Labor Law (the "Labor Law") to individuals who perform traffic control duty or "flagger" tasks in connection with public works construction projects within the jurisdiction of the City of New York. The guidance set forth herein is effective July 1, 2024 and applies only to public works contracts and subcontracts solicited on or after such date.

For purposes of this memorandum, "traffic control duty" means tasks necessary or appropriate to alleviate congestion by directing the flow of pedestrian and/or vehicular traffic away from the vicinity of the construction site using a sign or flag. Workers performing traffic control duty in connection with a public works construction project, whether or not such workers are on, adjacent to, or in close proximity to the construction site, are performing the work of a construction "laborer," as directing traffic away from the job site serves to protect the public and safeguard the work crew. Such workers are thus subject to the prevailing wage requirements of Article 8, Section 220 of the Labor Law as "laborers, workmen, or mechanics." Accordingly, the Prevailing Rate of Wages and Supplements applies to such individuals.

Additionally, workers who perform "flagger" tasks relating to the protection of the public and/or work crew, including but not limited to erecting traffic cones, setting up construction site barriers, and directing the movement of trucks or construction equipment in, on, and off the site, also are subject to the requirements of Article 8, Section 220 of the Labor Law and the Prevailing Rate of Wages and Supplements.

This position is consistent with the New York State Department of Labor's position under Article 8 of the New York Labor Law and the U.S. Department of Labor's position under the Davis-Bacon Act and will promote and streamline compliance with prevailing wage requirements on the various public works construction projects within New York City.

If the trade performing the underlying work performs its own flagging or traffic control, e.g., bridge painters, the flagger or traffic control worker shall receive the same wages as the underlying trade. In the absence of an underlying trade, the flagger or traffic control worker shall receive the wages as set forth in the "Flagger" section of the New York City Comptroller's Construction Worker Prevailing Wage Schedule.

Contractors, agencies, and members of the public are encouraged to contact the Bureau of Labor Law to seek clarification regarding specific instances to ensure compliance with prevailing wage regulations and this memorandum.

Changes between the 7/1/2023 and 7/1/2024 Single Contract General Conditions

NOTE: The list below is intended as a guide and does not include minor editing.
The text of the General Conditions and the Addendum to the General Conditions govern.

Section No.	Change
01 21 00.10	Section number revised
01 21 00.20	Section number revised
01 21 10.30	New Section Added
01 29 00	1.5.A: Added “mobilization” 1.5.B: Added “Due Date” 1.5.E.2: Added “within the continental United States”
01 40 00	1.10: Added section regarding offsite Special Inspections
01 42 00	1.4: Added reference to Fenestration and Glazing Industry Alliance (FGIA)
01 50 00	3.5.H.3: Removed extra allowance 3.8.D.3.a: Updated link to website 3.14.G: Added section regarding NYCPURS
01 91 13	Updated Commissioning requirements throughout

Department of Design and Construction

Issue Date: July 1, 2024

DDC STANDARD GENERAL CONDITIONS

FOR SINGLE CONTRACT PROJECTS

DIVISION 01 – DDC STANDARD GENERAL CONDITIONS – SINGLE CONTRACT PROJECTS
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SECTION 01 10 00
SUMMARY

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. Addendum to the General Conditions: These General Conditions include and are supplemented by the Addendum to the General Conditions (the "Addendum"). The Addendum includes the following: (1) schedules referred to in these General Conditions, (2) information regarding the applicability of various articles, and (3) amended articles, if any.

1.2 SUMMARY:

A. This section includes the following:

1. Scope and Intent
2. Provisions Referenced in the Contract
3. Performance of Work During Non-Regular Work Hours (Pursuant to a Change Order)
4. Interruption of Services at Existing Facilities

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 SCOPE AND INTENT:

A. Description of Project: Refer to the Addendum for a description of the Project.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4 B

B. LEED: The City of New York will seek U.S. Green Building Council (USGBC) LEED (Leadership in Energy and Environmental Design) certification for this Project as specified in Section 01 81 13.03 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS"; or Section 01 81 13.04 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS", and the Addendum to the General Conditions.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4 C

C. COMMISSIONING: The Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS, and/ or Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE and the Addendum to the General Conditions. The Contractor must cooperate with the commissioning agent and provide whatever assistance is required.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4 D

D. PROGRESS SCHEDULE: Refer to Section 01 32 16.1 PROGRESS SCHEDULES (METHOD A) or 01 32 16.2 PROGRESS SCHEDULES (METHOD B) or 01 32 16.3 PROGRESS SCHEDULES (METHOD C) and the Addendum to the General Conditions for requirements of the Project.

E. COMPLETION OF WORK: Work to be done under the Contract is comprised of the furnishing of all labor, materials, equipment and other appurtenances, and obtaining all regulatory agency approvals necessary and required to complete the construction work in accordance with the Contract.

F. OMISSION OF DETAILS: All work called for in the Specifications applicable to the Contract but not shown on the Contract Drawings in their present form, or vice versa, is required, and must be performed by the Contractor as though it were originally delineated or described. The cost of such work will be deemed included in the total Contract Price.

G. WORK NOT IN SPECIFICATIONS OR CONTRACT DRAWINGS: Work not particularly specified in the Specifications nor detailed on the Contract Drawings but involved in carrying out their intent or in the complete and proper execution of the Work, is required, and must be performed by the Contractor. The cost of such work will be deemed included in the total Contract Price.

H. SILENCE OF THE SPECIFICATIONS: The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, will be regarded as meaning that only the best practice is to prevail and that only the best material and workmanship is to be used and interpretation of the Specifications will be made upon that basis.

I. CONFLICT BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS: Should any conflict occur in or between the Drawings and Specifications, the Contractor will be deemed to have estimated the most expensive way of doing the Work unless the Contractor asked for and obtained a decision in writing from the Commissioner before the submission of the bid as to what must govern.

1.5 CONTRACT DRAWINGS AND SPECIFICATIONS:

A. SCHEDULE C - The Contract Drawings are listed in Schedule C, which is set forth in the Addendum. Such drawings referred to in the Contract, and in the applicable Specifications for the Contract, bear the general title:

City of New York
Department of Design and Construction
Division of Public Buildings

B. DOCUMENTS FURNISHED TO THE CONTRACTOR - After the award of the Contract, the Contractor will be furnished with five (5) complete sets of paper prints of all Contract Drawings mentioned in Paragraph A above, as well as a copy of the Specifications.

C. ADDITIONAL COPIES of Drawings and Specifications, when requested, will be furnished to the Contractor if available.

D. SUPPLEMENTARY DRAWINGS - When, in the opinion of the Commissioner, it becomes necessary to more fully explain the work to be done, or to illustrate the work further, or to show any changes which may be required, drawings known as Supplementary Drawings will be prepared by the Commissioner.

E. COMPENSATION - Where Supplementary Drawings entail extra work, compensation therefore to the Contractor will be subject to the terms of the Contract. The Supplementary Drawings will be binding upon the Contractor with the same force as the Contract Drawings.

F. SUPPLEMENTARY DRAWING PRINTS - Three (3) copies of prints of these Supplementary Drawings will be furnished to the Contractor.

G. COPIES TO SUBCONTRACTORS - The Contractor must furnish each of its Subcontractors and material suppliers such copies of Contract Drawings, Supplementary Drawings, or copies of the Specifications as may be required for its work.

1.6 COORDINATION:

A. COORDINATION AND COOPERATION - The Contractor must consult and study the requirements of the Contract Drawings and Specifications for all required work, including all work to be performed by trade Subcontractors, so that the Contractor may become acquainted with the work of the Project as a whole in order to achieve the proper coordination and cooperation necessary for the efficient and timely performance of the work.

B. CONTRACTOR TO CHECK DRAWINGS: - The Contractor must verify all dimensions, quantities and details shown on the Contract Drawings, Schedules, or other data received from the Commissioner, and must notify the Commissioner of all errors, omissions, conflicts and discrepancies found therein. Notice of such errors will be given before the Contractor proceeds with any work. Figures must be used in preference to scale dimensions and large-scale drawings in preference to small-scale drawings.

1.7 SHOP DRAWINGS AND RECORD DRAWINGS:

A. Refer to Section 01 33 00 SUBMITTAL PROCEDURES and Section 01 78 39 CONTRACT RECORD DOCUMENTS for requirements applicable to shop drawings and record drawings.

1.8 TEMPORARY FACILITIES, SERVICES AND CONTROLS:

A. Refer to Section 01 50 00 TEMPORARY FACILITIES SERVICES AND CONTROLS for the responsibilities of the Contractor.

1.9 DUST CONTROL:

A. The Contractor must prepare, execute and manage a “Dust Control Plan” for the prevention of the emission of dust from construction related activities in compliance with 15 RCNY 13-01 et. seq.

1.10 PROVISIONS REFERENCED IN THE CONTRACT:

A. SCHEDULE A - Various Articles of the Contract refer to requirements set forth in Schedule A of the General Conditions. Schedule A, which is included in the Addendum, sets forth (1) the referenced Articles of the Contract, and (2) the specific requirements applicable to the Contract.

B. EXTENSION OF TIME - Applications for Extensions of Time, as indicated in Article 13 of the Contract, must be made in accordance with the Rules of the Procurement Policy Board.

C. ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING: The Contractor must submit reports to the Commissioner regarding the use of Ultra Low Sulfur Diesel Fuel in Non-Road Vehicles, and the implementation of Best Available Technology (BAT), as set forth in Article 5.4 of the Contract. Such reports must be submitted in accordance with the schedule, format, directions, and procedures established by the Commissioner.

1.11 PERFORMANCE OF WORK DURING NON-REGULAR WORK HOURS:

A. NON-REGULAR WORK HOURS: The Commissioner may issue a change order in accordance with Article 25 of the Contract which, (1) directs the Contractor to perform the Work, or specific components thereof, during other than regular work hours (i.e., evenings, weekends and holidays), and (2) provides compensation to the Contractor for costs in connection with the performance of Work during other than regular work hours. The Commissioner may issue a change order if a delay has occurred and such delay is not the fault of the Contractor, or if the Work is of such an important nature that delay in completing such work would result in serious disadvantage to the public.

B. PROCEDURE: The Contractor must: (1) obtain whatever permits may be required for performance of the Work during other than regular business hours, and (2) pay all necessary fees in connection with such permits. In addition, if directed by the Commissioner, the Contractor must make immediate application to the Commissioner of the Department of Labor, State of New York, for dispensation in accordance with Subdivision 2 of Section 220 of the Labor Law.

1.12 INTERRUPTION OF SERVICES AT EXISTING FACILITIES:

A. EVENING AND WEEKEND WORK - Where performance of the Work requires the temporary shutdown(s) of services, such shutdown(s) must be made at night or on weekends or at such times that will cause no interference with the established routines and operations of the facility in question.

1 Where weekend or evening work is required due to unavoidable service shutdowns, such work will be performed at no extra cost to the City. Components of the Work that must be performed during other than regular work hours are indicated in the Drawings and/or the Specifications.

B. INTERRUPTION OF EXISTING FACILITIES:

1 The Contractor must not interrupt any of the services of the facility nor interfere with such services in any way without the permission of the Commissioner. Such interruption or interferences must be made as brief as possible, and only at such time stated.

2 Under no circumstances will the Contractor, its Subcontractors, or its workers, be permitted to use any part of the project as a shop, without the permission of the Commissioner.

3 Unnecessary noise must be avoided at all times and necessary noise must be reduced to a minimum.

4 Toilet facilities, water, and electricity must be operational at all times (i.e. 24/7). No services of the facility can be interrupted in any way without the permission of the Commissioner. Careful coordination of all Work with the Commissioner must be done to maintain the operational level of the Project personnel at the facility.

5 The Contractor must schedule the Work to avoid noise interference that will affect the normal functions of the facility. In particular, construction operations producing noises that are objectionable to the functions of the facility must be scheduled at times of day or night, day of the week, or weekend, which will not interfere with personnel at the facility. Any additional cost resulting from this scheduling will be borne by the Contractor.

6 The Contractor must arrange to work continuously, including evening and weekend hours, if required,

to assure that services will be shut down only during the time actually required to make the necessary connections to the existing facility.

7 The Contractor must give ample written notice in advance to the Commissioner and personnel at the facility of any required shutdown.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 21 00.10

PRICE ADJUSTMENT ALLOWANCE

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 21 00.10

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) City of New York Standard Construction Contract.

1.2 SUMMARY

A. This Section includes:

1. Asphalt Price Adjustment

2. Fuel Price Adjustment

3. Steel Price Adjustment

1.3 SCOPE AND INTENT

A. This section will provide for additional compensation to the Contractor for increases, or repayment by the Contractor for decreases, in the price of asphalt, fuel, or steel products.

B. Price Adjustments will be made only for eligible work as defined below. With respect to asphalt and steel eligible work items, price adjustment will be paid, if eligible, only after the items have been permanently incorporated into the Work and accepted by the Commissioner. With respect to fuel, price adjustment will be paid, if eligible, only after fuel has been delivered to the Project site.

C. No adjustment will be provided for any extra work paid by fixed price in accordance with the Standard Construction Contract Article 25.3.2 or paid for on a time and material basis per Standard Construction Contract Article 26. Additional quantities of existing Contract pay items at original bid prices will be considered eligible for asphalt, fuel, and steel price adjustments.

D. Temporary work performed by the Contractor at its own expense will not be eligible for price adjustment. Notwithstanding the foregoing, temporary asphalt will be eligible if shown on the Contract Drawings or required to complete the Work and must be approved in advance by the Commissioner.

E. The Contractor, its Subcontractor(s) and/or Materialmen, must, when directed by the Commissioner, provide

any and all Project documents and/or records the Commissioner deems pertinent to his/her determination with respect to the price adjustment. If requested by the Commissioner, the Contractor, its Subcontractor(s) and/or Materialmen, must provide copies of Project documents and/or records.

F. Failure by the Contractor, its Subcontractor(s) and/or Materialmen, to comply strictly with the requirement to provide Project records will constitute a waiver of any claim for additional compensation the Contractor may have in connection with the price adjustment request.

G. Project documents and/or records include, without limitation, Bid and Contract Documents, shop drawings, manufacturing and/or shipping data, as-built drawings, books of account, financial statements, invoices, vouchers, records, daily job diaries and reports.

H. If the Contractor is paid additional compensation in accordance with this Section, the Contractor must pay a properly allocated share of such additional compensation to the applicable Subcontractor(s) and/or Materialmen.

1.4 PRICE ADJUSTMENT VALUES

A. The monthly average asphalt prices, monthly average fuel prices, steel cost basis and steel index values will be posted on the NYS Department of Transportation (NYSDOT) website: https://www.dot.ny.gov/main/business-center/contractors/construction-division/fuel-asphalt-steel-price-adjustments

B. Historical index values are available as issued Engineering Bulletins on the NYSDOT website: https://www.dot.ny.gov/eieb

1.5 ASPHALT PRICE ADJUSTMENT

A. **Price Changes.** The asphalt price adjustment will be based solely on the price changes for asphalt as determined by the formulas below. No adjustment will be made if the monthly average posted price is within $15.00 of the asphalt index price. No consideration will be given to the situation where the price paid by the Contractor, its Subcontractors, or the Contractor's or Subcontractor's supplier(s) exceeds the monthly average posted price.

B. **Applicability**. The asphalt price adjustment will apply to all permanent asphalt pavement items. The asphalt price adjustment will apply to temporary asphalt pavement if the temporary asphalt is shown on the Contract Drawings or approved in advance by the Commissioner. No price adjustment will be made for tack coat or pothole cold patch.

C. **Prices**. The asphalt index price and the monthly average posted price are defined as follows:

1. Asphalt Index Price. The asphalt index price is a price per ton of binder (also referred to as liquid bitumen or asphaltic cement) used solely as a basis from which to compute asphalt price adjustments. The asphalt index price will be the monthly average posted price for the month and year the bid opening for the Project.

2. Monthly Average Posted Price. The monthly asphalt index prices will be determined by NYSDOT using the methods set forth in NYSDOT Standard Specification Section 698.

D. **Quantity**. The quantity of asphalt in tons considered for adjustment will be determined by the tons of asphalt

actually placed. This will be calculated using the measured volume of asphalt placed, and the asphalt's in-place density, as measured in the field. Quantities of asphalt will be measured to the nearest 0.1 ton.

E. **Adjustment**. Asphalt price adjustment will be based on the following formulas:

1. When price increases: Price Adjustment = (Quantity of Asphalt) x (Monthly Average Posted Price – Asphalt Index Price - $15.00)

2. When price decreases: Price Adjustment = (Quantity of Asphalt) x (Monthly Average Posted Price – Asphalt Index Price + $15.00)

F. **Payment of the Price Adjustment.** The Contractor is required to keep a log of all asphalt incorporated into the Project that is eligible for the price adjustment. The log must keep track of the date when the asphalt was purchased, the quantity of the asphalt, the Asphalt Index Price and the Monthly Average Posted Price, as determined in accordance with 1.5.C.

1. When the adjustment amount, calculated in accordance with 1.5.E, exceeds $10,000.00 for all eligible asphalt incorporated into the Project, the Contractor must submit with its monthly payment requisition, the request for payment of the asphalt price adjustment.

1.6 FUEL PRICE ADJUSTMENT

A. **Price Changes**. The fuel price adjustment will be based solely on the price changes for fuel as determined by the formulas below. No adjustment will be made if the monthly average posted price is within $0.10 per gallon of the fuel index price. No consideration will be given to the situation where the price paid by the Contractor, its Subcontractors, or the Contractor's or Subcontractor's supplier(s) exceeds the monthly average posted price.

B. **Applicability**. The intent of the fuel price adjustment is to cover on-site equipment and vehicles only as delineated below.

1. The fuel price adjustment will apply for fuel used in:
   a. Diesel equipment used on site, such as backhoes, excavators, cranes.
   b. Stationary equipment used on site, such as trailer or skid mounted compressors, generators, or light towers.
   c. Gasoline or diesel trucks and vans that are assigned to the site full-time, which may be used for off-site pickups and deliveries.
   d. Equipment used for temporary heating.

2. The fuel price adjustment will not apply to:
   a. On-site gasoline powered hand tools, such as chainsaws, cut-off saws, pressure washers, small generators, etc.
   b. Vehicles (cars, pickup trucks) that are also used for commuting.
   c. Delivery vehicles.
   d. Any equipment at the Contractor's shop, manufacturer's shop, or other off-site facility.

C. **Prices**. The fuel index price and the monthly average posted price are defined as follows:

1. Fuel Index Price. A price per gallon of fuel used solely as a basis from which to compute fuel price adjustments. The fuel index price will be the monthly average posted price for the month of the bid letting.

2. Monthly Average Posted Price. The monthly fuel index prices will be determined by NYSDOT using the methods set forth in NYSDOT Standard Specification Section 698.

D. **Quantity**. The quantity of fuel in gallons considered for adjustment will be determined by invoices for fuel delivered to the Project site. Quantities of fuel will be measured to the nearest 0.01 gallon.

E. **Adjustment**. Fuel price adjustment will be based on the following formulas:

1. When price increases: Price Adjustment = (Quantity of Fuel) x (Monthly Average Posted Price - Fuel Index Price - $0.10)

2. When price decreases: Price Adjustment = (Quantity of Fuel) x (Monthly Average Posted Price - Fuel Index Price + $0.10)

F. **Payment of the Price Adjustment.** The Contractor is required to keep a log of all fuel incorporated into the Project that is eligible for the price adjustment. The log must keep track of the date when the fuel was purchased, the quantity of the fuel, the Fuel Index Price and the Monthly Average Posted Price, as determined in accordance with 1.6.C.

1. When the adjustment amount, calculated in accordance with 1.6.E, exceeds $10,000.00 for all eligible fuel delivered to the Project site, the Contractor must submit with its monthly payment requisition, the request for payment of the fuel price adjustment.

1.7 STEEL PRICE ADJUSTMENT

A. **Applicability**. The intent of the steel price adjustment is to cover steel materials as follows. For the purposes of this section, steel includes all steel alloys, stainless steel alloys, iron, and ductile iron.

1. Steel price adjustment will apply to groups of similar material content (“Material Groups”) within a specification section (e.g., structural steel shapes under 05 21 00 – STRUCTURAL STEEL FRAMING or reinforcing bars under 03 20 00 – CONCRETE REINFORCING).

2. The steel price adjustment will apply to the following Material Groups:
   a. Structural steel and joists
   b. Reinforcing bars
   c. Steel deck pans
   d. Cold formed steel framing and trusses
   e. Stair stringers and pans
   f. Steel dunnage for equipment
   g. Steel piling
   h. Drainage, water, and electrical piping and tubing
   i. Steel doors
   j. Municipal steel and iron castings (manhole covers, sewer grates, etc.)

3. The steel price adjustment will not apply to the following:
   a. Steel in fabricated elements, such as HVAC chillers or electrical fixtures and boxes
   b. Handrails, access ladders, and other miscellaneous metals
   c. Anchor bolts and fasteners

B. For each Material Group listed, the Contractor must also identify the parties whose relationship establishes the invoice date. If the parties are known, they must be identified by name. If the two parties are not

known, they must be identified by role (Contractor, Subcontractor, Materialman, fabricator, etc.). Different parties may be identified for scopes within a Material Group for the purposes of establishing an invoice date. If the Contractor does not provide a list of materials to which to apply the steel price adjustment, no steel price adjustment will be made.

C. If the percentage change for a given month does not exceed 5% plus or minus, from the benchmark steel index, no adjustments will be made for materials invoiced that month.

D. The percentage change for each material group identified in Article 1.7.A.2 above will be determined using the month that the largest value of materials were invoiced.

E. The weight of the steel must exclude minor appurtenances individually weighing less than 5 lbs (i.e., nuts, bolts, washers, etc.) and non-steel components, such as door insulation or glazing. Precast or prestressed concrete items must have total reinforcing steel weight listed on the approved shop drawings. The following sources must be used, in declining order of precedence, to determine the weight of steel: approved shop drawings; verified shipping documents; Contract Documents; industry standards (i.e., AISC Manual of Steel Construction, AWWA Standards, etc.); and manufacturer's data.

1. **Indexes and Prices**. Adjustments are based on the Producer Price Index (PPI) for Semifinished Steel Mill Products (WPU 101702). PPI values are published by the US Department of Labor, Bureau of Labor Statistics (BLS). Recent PPI values are posted on the NYSDOT website linked above. The Cost Basis, Benchmark Steel Index, Monthly Steel Index, and the Percentage Change are defined as follows:

   a. **Cost Basis (CB).** An average price of steel products in dollars per ton used solely as a cost basis from which to compute steel price adjustments. The cost basis for original Contract bid price items and additional work at the original Contract bid price will be the cost basis listed for the month of the bid letting. The cost basis for additional work at agreed price will be the value of the cost basis for the month the agreed price was submitted to the Commissioner.
   b. **Benchmark Steel Index (BI).** The benchmark steel index for original Contract bid price items and additional work at the original Contract bid price will be the value of the preliminary PPI for the month of the bid letting. The benchmark steel index for additional work at agreed price will be the value of the preliminary PPI for the month the agreed price was submitted to the Commissioner.
   c. **Monthly Steel Index (MI)**. Value of the final PPI for the month the material is invoiced.
   d. **Percent Change**. The percent change in any given month will be determined as follows:

$$Percentage\ Change = \left(\frac{MI - BI}{BI} \right) x\ 100$$

F. The quantity of steel for adjustment of each Material Group will be measured to the nearest 0.1 tons.

1. **Percent Change Greater Than +5%**. If the Percentage Change is greater than +5% from the benchmark steel index, Price Adjustments will be made for materials invoiced that month. The Contractor must provide the Commissioner a detailed list of the weight of eligible materials within 60 calendar days after installation, including: the Contract pay item, the weight of steel, the month(s) of invoice, the source used to determine the weight, and if requested by the Commissioner, copies of invoices to verify the month of invoice.

2. **Percent Change -5% to +5%.** If the Percentage Change is between -5% and +5%, inclusive, from the benchmark steel index, no adjustments will be made for materials invoiced that month.

3. **Percent Change Lower Than -5%.** If the Percentage Change is lower than -5% from the benchmark steel index, a Price Adjustment will be charged to the Contractor for materials invoiced that month. The Contractor must provide the Commissioner a detailed list of the weight of eligible materials within 60 calendar days after installation, including: the Contract pay item, the weight of steel, the month(s) of invoice, the source used to determine the weight, and copies of invoices to verify the month of invoice.

G. **Adjustment.** Steel price adjustment will be made for all the materials which the Contractor opted to apply the steel price adjustment, based on the following formulas:

1. When price increases:

$$Price\ Adjustment = \left[\left(\frac{MI - BI}{BI}\right) - 0.05\right](CB)\,Qty$$

2. When price decreases:

$$Price\ Adjustment = -\left[\left(\frac{MI - BI}{BI}\right) + 0.05\right](CB)\,Qty$$

H. **Payment of the Price Adjustment.** Steel Price Adjustment will be paid once during the Project duration for each eligible Material Group after the final PPI is available to set the Monthly Steel Index for the invoice month determined in Article 1.7.D above.

1.8 MEASUREMENT AND PAYMENT

A. The fixed sum shown in the Bid Breakdown or Bid Schedule for Price Adjustments Allowance will be considered the price bid for this item. The fixed sum is not to be altered in any manner by the bidder. Should the amount shown be altered, the new figures will be disregarded and the original price will be used to determine the total amount bid for the Contract. The fixed sum payment made under this item will be equal to the sum of payments and credits for price adjustments, as approved by the Commissioner, with no markup for overhead, profit, or other fees allowed. The fixed sum amount is included in the bid solely to ensure that sufficient monies will be available to pay the Contractor for the price escalation adjustment payments as delineated herein, which may be more or less than the fixed sum amount.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 21 00.10

SECTION 01 21 00.20

EXPANDED WORK ALLOWANCE

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 21 00.20

PART I - GENERAL

1.1 PURPOSE

A. An Allowance has been established for the items set forth in sub-section 1.3 below ("Expanded Work Allowance" or "EWA"). Payment for the items set forth in sub-section 1.3 ("Expanded Work Items") may be made through the EWA, as directed by the Commissioner. "Extra Work", "overrun", and "Allowance" are defined by the Standard Construction Contract (see Articles 2.1.16, 26.1, and 2.1.4, respectively) and nothing in this Section alters, or will be deemed to alter the interpretation or application of, the Standard Construction Contract, including but not limited to Articles 25, 26, 28, and 78 of the Standard Construction Contract.

1.2 PROCESS

A. If the Commissioner determines that use of the EWA is appropriate, in their sole discretion, the Commissioner will prepare a written scope document for the Expanded Work Items for the Contractor's execution ("EWA Scope Memo"). The EWA Scope Memo will set forth the maximum amount payable from the EWA prior to the execution of a final cost memorandum ("Maximum Amount"), in accordance with this Section. The Maximum Amount may be increased from time to time by the Commissioner, in their sole discretion, except that the Maximum Amount may not exceed 80% of the Commissioner's estimated total cost for such Work (the "Estimated Cost") unless and until a final cost is determined and a final cost memorandum ("Final Cost Memo") executed in accordance with this Section.

B. Neither the Maximum Amount nor the Estimated Cost will be deemed to be the final cost of the Expanded Work Items. The final cost for the Expanded Work Items will be determined in accordance with Article 26 of the Standard Construction Contract. The Contractor must submit its detailed price proposal for the Expanded Work Items, calculated in accordance with the Contract, within the time period set forth in the EWA Scope Memo or within 90 Days after the executed EWA Scope Memo is issued to the Contractor, whichever is sooner.

C. Once the EWA Scope Memo is executed and the Contractor is directed to proceed with the Work, DDC will make progress payments, as provided in the Contract, up to the Maximum Amount or until the submission period has expired, whichever occurs sooner.

D. DDC will not make any progress payments for the performance of the Expanded Work Items beyond the submission period set forth in sub-Section C, above, unless and until a final cost has been determined and a Final Cost Memo executed in accordance with this Section. No amounts above the Maximum Amount set by the Commissioner will be payable from the EWA, unless and until a final cost has been determined and a Final Cost Memo executed in accordance with this Section. In all events, the Contractor shall promptly and diligently comply with the Commissioner's direction and perform all Work required by the Contract and the EWA Scope Memo.

E. Upon receipt of the Contractor's cost detailed proposal, DDC will evaluate the proposal and initiate negotiations, as necessary, to determine the final cost of the Expanded Work Items in accordance with Article 26 of the Standard Construction Contract. The Contractor is responsible to furnish time and material records in accordance with Article 28 of the Standard Construction Contract until a Final Cost Memo is executed. If the parties cannot agree on a unit price or fixed price, the Contractor will be paid on the basis of time and

material records in accordance with Article 26 the Standard Construction Contract.

F. A Final Cost Memo will be prepared by the Commissioner to be executed by the parties. The total net sum of the amounts added and/or credited under the EWA Scope Memo and payment of the finalized Final Cost Memo constitutes full accord and satisfaction for the costs resulting from the Expanded Work Items. In the event the EWA is insufficient to pay the full amount of the Final Cost Memo, the parties agree to execute change order documents for the remaining funds, subject to registration in accordance with the New York City Charter.

1.3 PRICE TO COVER

A. Expanded Work Items are those items set forth below. The EWA may be used, in the Commissioner's discretion, for the following Expanded Work Items:
   1. Non-material changes in the Work necessary to complete Contract Work due to site conditions that differ from those included in the Contract Documents and that could not have been anticipated by the Contractor.
   2. Non-material changes in the Work directed by the Commissioner that result in a net change in the cost to the Contractor for the Work to be performed under this Contract, including but not limited to the following:
      a. Overruns of unit price items and quantity increases in portions of work within a lump sum item.
      b. NYCDOT traffic stipulations or permit requirements that significantly differ from those included in the Contract Documents and that could not have been anticipated by the Contractor.
      c. Changes to the sizes of materials or changes to specifications of materials.
      d. Materials/structures not included in the Contract Documents that are necessary to complete Contract Work and that could not have been anticipated by the Contractor.

1.4 BASIS OF PAYMENT

A. The fixed sum must be considered the price bid for this item. The fixed sum is not to be altered in any manner by the bidder. Should the amount shown be altered, the new figures will be disregarded, and the original price will be used to determine the total amount bid for the contract.

B. The payment(s) made under this item will be equal to the Final Cost Memo prepared by the Commissioner and executed by the parties in accordance with 1.2(F) above as proof of work performed for this item as approved by the Commissioner.

C. The total estimated cost of this item is the "fixed sum" amount shown for this item in the Bid Submission Form and shall not be varied in the bid. The "fixed sum" amount is included in the bid solely to ensure that sufficient monies will be available to pay the Contractor for this work, which may be more or less than the fixed sum amount.

D. The price will cover the cost of all labor, materials, equipment, insurance, and incidentals necessary to complete the work under this section in accordance with the Contract Drawings, the specifications, and the directions of the Commissioner.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 21 00.20

SECTION 01 21 00.30

PROJECT WORK ACCELERATION ALLOWANCE

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 21 00.30

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) City of New York Standard Construction Contract.

1.2 SUMMARY

A. This Section includes:

1. Accelerated Project Work

1.3 INTENT

A. Under this Allowance, the Contractor will be paid for Work deemed necessary by the City to accelerate the Project work items during periods specified by the City. The use of this item will expire on the scheduled Substantial Completion date for the Project, or within the time to which such Substantial Completion date may be extended by the City.

B. Accelerated Project Work, as described below, will be paid for under this item in accordance with the requirements of Articles 25 and 26 of the City of New York Standard Construction Contract.

C. Payment made under this Allowance will cover the cost of all labor, materials, plant, equipment, insurance, and incidentals necessary to accelerate the Project Work as ordered by the Commissioner.

D. No guarantee is given that this Allowance will in fact be utilized in this Contract. The estimated allowance amount is included in the total bid solely to ensure a method of payment for any accelerated Project Work performed by the Contractor, when directed by the Commissioner.

1.4 ACCELERATED PROJECT WORK

A. The Accelerated Project Work Allowance may only be used to achieve a specific goal as directed by the Commissioner, such as reducing delays to the Project's critical path.

B. The Accelerated Project Work Allowance will not be utilized to accelerate the Project Work due to any delays caused by the Contractor. If the Project Work is delayed to Contractor's fault, the Contract must accelerate the Work at the Contractor's sole cost and expense.

C. The Commissioner will initiate all requests for Accelerated Project Work. The request will include the requested goal for the Accelerated Project Work.

1. The Contractor must prepare a Time Impact Analysis per the requirements of the applicable Project Schedules Section (01 32 16.10, 01 32 16.20, or 01 32 16.30) in order to determine the anticipated time savings for a specific use of Accelerated Project Work. The costs required for the Time Impact Analysis must be included in the prices bid for all work and will not be reimbursed under this Allowance.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 21 00.30

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART I GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Section 01 60 00 PRODUCT REQUIREMENTS for requirements for submitting comparable product submittals for products by named or unnamed manufacturers. (i.e., “or approved equal” products)

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor that are not required to meet other Project requirements but may offer advantage to Contractor. Substitutions for Convenience are not permitted.

B. A substitution is not an “or approved equal” or a product, material, equipment, or method of construction that meets the requirements of the Contract Documents. A substitution is a change to the Contract, which, upon approval, will result in a change order.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form acceptable to the Commissioner.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.

b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by others that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with applicable codes and standards.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Commissioner's Action: If necessary, Commissioner will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Commissioner will notify Contractor of acceptance or rejection of proposed substitution within 10 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Commissioner's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Commissioner does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: The Contractor must investigate and document compatibility of proposed substitution with related products and materials. The Contractor must engage a qualified testing agency to perform compatibility tests recommended by manufacturers or the Commissioner. These investigations, documentation, and testing will be at the Contractor’s sole expense.

1.6 PROCEDURES

A. Change Orders: A substitution is a Contractor-initiated change order request. Before a substitution can be implemented, it must pass through two approval processes: substitution approval per Article 1.7 below, and change order approval. If the substitution receives approval, as part of the change order process, the Contractor may request that the Commissioner consider granting advanced authorization.

B. Coordination during preparation of substitution: The Contractor, when developing a substitution, must address the designer's objectives, environmental permit requirements and regulations, commitments made to the public to mitigate the impact of construction, and other such concerns.

C. Coordination during execution of substitution: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

D. Conditions: The Contractor must not base any bid process on the anticipated approval of a substitution and should recognize that any substitution may be rejected. The following terms and conditions apply to a substitution:

1. A substitution will only be considered after the contract is awarded.

2. A substitution applies only to the contract for which it was submitted. One substitution must not be submitted for multiple contracts. Approval or disapproval of a substitution on one contract does not guarantee approval or disapproval on another contract.

3. The substitution request becomes the property of the City and will contain no restrictions imposed by the Contractor on its use or disclosure. The City will have the right to use, duplicate, and disclose in whole or in part any data necessary for the utilization of the substitution. The City retains the right to utilize any accepted or rejected substitution or part thereof on any other project without any obligation to the Contractor.

4. When the Commissioner is in the process of making design and specification revisions and a Contractor submits a substitution with similar revisions, the Commissioner will reject the substitution.

5. A substitution will be considered only if reasonable, cost-effective options are not provided in the Contract Documents.

6. The Commissioner will be the sole judge as to whether a substitution qualifies for consideration and evaluation. The Commissioner may reject any substitution that requires excessive time or costs for design review, evaluation, and/or investigations. The Commissioner will be the sole judge in determining if the proposed substitution will result in a sufficient amount of direct or indirect cost savings to offset the City's effort to review the substitution.

7. A substitution must be consistent with DDC's design policies and basic design criteria, provide the same service life or more, facilitate economy of operations, ease of maintenance, and achieve the desired appearance and safety.

8. The simple elimination of work does not necessarily constitute a substitution, however, a substitution which introduces a simple material substitution, or elimination of work, may be considered if it is accompanied by a design change or change in the construction method. A simple material substitution which introduces a new material to DDC may be also considered.

9. The substitution must not be experimental in nature but will have been proven to the Commissioner's satisfaction under similar or acceptable conditions on another City contract or at another location acceptable to the Commissioner.

10. If the Commissioner requires any additional information to evaluate the substitution, this information must be provided in a timely manner. Unless otherwise mutually agreed upon, failure to do so will result in the rejection of the substitution. An incomplete or a poor-quality substitution which hinders the Commissioner's review may also result in the rejection of the substitution.

11. The Contractor must allow submissions of substitution from an approved Subcontractor, provided that reimbursement is made by the City to the Contractor and that the terms of payment to the Subcontractor are satisfactorily negotiated and accepted before the substitution is submitted to the Commissioner. Subcontractors may not submit a substitution except through the Contractor.

12. A substitution approved by the Commissioner will be a revision to the Contract Documents and progress schedule. Consequently, if unsatisfactory results are being achieved or adjustments are necessary during implementation of a substitution, the rejection of work, removal of work, addition of work, or revision of work must be evaluated in accordance with the Contract requirements.

13. No work related to a substitution will be performed under allowance items. Agreed prices must be reached for the substitution before the substitution is approved. If the Contractor is deemed to have taken reasonable diligence in determining the work involved but if during the construction of substitution work a significant change in the character of work occurs, the Commissioner may consider new agreed prices.

14. The Contractor will receive written notification from the Commissioner when the substitution is approved. Material orders placed prior to substitution approval are placed at the Contractor's risk.

15. Once a substitution has been approved, the substitution will then be submitted as a change order and processed accordingly. The Contractor is responsible for submitting all appropriate information to the Commissioner in a timely manner.

1.7 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 30 days prior to time required for preparation and review of related submittals.

1. Conditions: Commissioner will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Commissioner will return requests without action, except to record noncompliance with these requirements:

   a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   b. Substitution request is fully documented and properly submitted.
   c. Requested substitution will not adversely affect Contractor's construction schedule.
   d. Requested substitution has received necessary approvals of authorities having jurisdiction.
   e. Requested substitution is compatible with other portions of the Work.
   f. Requested substitution has been coordinated with other portions of the Work.
   g. Requested substitution provides specified warranty.
   h. If requested substitution involves more than one Subcontractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all Subcontractors involved.

B. Substitutions for Convenience: Not allowed.

PART II – PRODUCTS (Not Used)

PART III - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 012900

PAYMENT PROCEDURES

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract]

1.2 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process payment requisitions.

B. Related Requirements:

1. Sections 01 32 16.10, 01 32 16.20, or 01 32 16.30 PROJECT SCHEDULES (METHOD A/B/C) for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's payment requisitions. The Schedule of Values serves as the Bid Breakdown on Lump Sum per Article 41 of the Standard Construction Contract.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's construction schedule per Sections 01 32 16.10, 01 32 16.20, or 01 32 16.30. If Section 01 32 16.30 is used and the Contractor’s Critical Path Method Schedule is cost loaded, it will serve as the Schedule of Values.

1. Coordinate line items in the Schedule of Values with items required to be indicated as separate activities in Contractor's construction schedule.
2. Submit the Schedule of Values to the Commissioner at earliest possible date and as required in Standard Construction Contract Article 41.1.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Arrange Schedule of Values consistent with format provided by the Commissioner.

2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of payment request and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.

3. Allowances and Unit Prices: Provide a separate line item in the Schedule of Values for each allowance and unit price item. Show line-item value of unit price items, as a product of the unit cost, multiplied by measured quantity.

4. Overhead Costs, Separate Line Items: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place, as separate line items.

5. Schedule of Values Revisions: Revise the Schedule of Values when Change Orders result in a change in the lump sum price. Include at least one separate line item for each Change Order.

1.5 PAYMENT REQUISITIONS

A. Each payment requisition following the initial mobilization payment requisition must be consistent with the previous requisitions and payments, as certified by the Commissioner. Each partial payment requisition must comply with the requirement of Article 42 of the Standard Construction Contract.

B. Payment Requisition Times: The Contractor must submit the payment requisition to the Commissioner by the end of the month following the payment period (“Due Date”). The period covered by each payment requisition is one month, ending on the last day of the month, unless a longer payment period is approved by the Commissioner.

1. The Contractor must submit a draft copy of the payment requisition seven days prior to Due Date for review by Commissioner.

C. Payment Requisition Forms: Use forms provided by the Commissioner as form for payment requisitions.

D. Payment Requisition Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Commissioner will return incomplete payment requisitions without action.

1. Entries shall match data on the Schedule of Values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous payment requisition, whether or not payment has been received. Include only amounts for work completed at time of payment requisition.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by requisition.

E. PARTIAL PAYMENTS FOR MATERIALS IN ADVANCE OF THEIR INCORPORATION IN THE WORK PURSUANT TO ARTICLE 42 OF THE CONTRACT – In order to better ensure the availability of materials, fixtures and equipment when needed for the work, the Commissioner may authorize partial payment for certain materials, fixtures and equipment, prior to their incorporation in the work, but only in strict accordance with, and subject to, all the terms and conditions set forth in the Specifications, unless an alternate method of payment is elsewhere provided in the Specifications for specified materials, fixtures or equipment.

1. The Contractor must submit to the Commissioner a written request, in quadruplicate, for payment for materials purchased or to be purchased for which the Contractor needs to be paid prior to their actual

incorporation in the work. The request must be accompanied by a schedule of the types and quantities of materials, and must state whether such materials are to be stored on or off the site.

2. Where the materials are to be stored off the site, they must be stored at a place within the continental United States other than the Contractor's premises (except with the written consent of the Commissioner) and under the conditions prescribed or approved by the Commissioner. The Contractor must set apart and separately store at the place or places of storage all materials and must clearly mark same "PROPERTY OF THE CITY OF NEW YORK", and further, must not at any time move any of said materials to another off-site place of storage without the prior written consent of the Commissioner. Materials may be removed from their place of storage off the site for incorporation in the work upon approval of the Commissioner.

3. Where the materials are to be stored at the site, they must be stored at such locations as will be designated by the Commissioner and only in such quantities as, in the opinion of the Commissioner, will not interfere with the proper performance of the Work by the Contractor or by other Subcontractors then engaged in performing work on the site. Such materials must not be removed from their place of storage on the site except for incorporation in the Work, without the approval of the Commissioner.

4. INSURANCE

   a. STORAGE OFF-SITE – Where the materials are stored off the site and until such time as they are incorporated in the Work, the Contractor must fully insure such materials against any and all risks of destruction, damage or loss including but not limited to fire, theft, and any other casualty or happening. The policy of insurance must be payable to the City of New York. It must be in such terms and amounts as must be approved by the Commissioner and must be placed with a company duly licensed to do business in the State of New York. The Contractor must deliver the original and one (1) copy of such policy or policies marked "Fully Paid" to the Commissioner.

   b. STORAGE ON THE SITE – Where the materials are stored at the site, the Contractor must furnish satisfactory evidence to the Commissioner that they are properly insured against loss, by endorsements or otherwise, under the policy or policies of insurance obtained by the Contractor to cover losses to materials owned or installed by the Contractor. The policy of insurance must cover fire and extended coverage against windstorm, hail, explosion and riot attending a strike, civil commotion, aircraft, vehicles and smoke.

5. All costs, charges and expenses arising out of the storage of such materials, must be paid by the Contractor and the City hereby reserves the right to retain out of any partial or final payment made under the Contract an amount sufficient to cover such costs, charges and expenses with the understanding that the City will have and may exercise any and all other remedies at law for the recovery of such cost, charges and expenses. There will be no increase in the Contract price for such costs, charges and expenses and the Contractor must not make any claim or demand for compensation therefore.

6. The Contractor must pay any and all costs of handling and delivery of materials, to the place of storage and from the place of storage to the site of the Work; and the City will have the right to retain from any partial or final payment an amount sufficient to cover the cost of such handling and delivery.

7. In the event that the whole or any part of these materials are lost, damaged, or destroyed in advance of their satisfactory incorporation in the work, the Contractor, at the Contractor's own cost, must replace such lost, damaged or destroyed materials of the same character and quality. The City will

reimburse the Contractor for the cost of the replaced materials to the extent, and only to the extent, of the funds actually received by the City under the policies of insurance hereinbefore referred to. Until such time as the materials are replaced, the City will deduct from the value of the stored materials or from any other money due under the Contract, the amount paid to the Contractor for such lost, damaged or destroyed materials.

8. Should any of the materials paid for the City hereunder be subsequently rejected or incorporated in the work in a manner or by a method not in accordance with the Contract Documents, the Contractor must remove and replace, at Contractor's own cost, such defective or improperly incorporated material with materials complying with the Contract Documents. Until such materials are replaced, the City will deduct from the value of the stored materials or from any other money due to the Contractor, the amount paid by the City for such rejected or improperly incorporated materials.

9. Payments for the cost of materials made hereunder will not be deemed to be an acceptance of such materials as being in accordance with the Contract Documents, and the Contractor always retains and must comply with the Contractor's duty to deliver to the site and properly incorporate in the work only materials which comply with the Contract Documents.

10. The Contractor must retain any and all risks in connection with the damage, destruction, or loss of the materials paid for hereunder to the time of delivery of the same to the site of the Work and their proper incorporation in the work in accordance with the Contract Documents.

11. The Contractor must comply with all laws and the regulations of any governmental body or agency pertaining to the priority purchase, allocation, and use of the materials.

12. When requesting payment for such materials, the Contractor must submit with the partial estimate duly authenticated documents of title, such as bills of sale, invoices or warehouse receipts, all in quadruplicate. The executed bills of sale must transfer title to the materials from the Contractor to the City. (In the event that the invoices state that the material has been purchased by a Subcontractor, bills of sale in quadruplicate will also be required transferring title to the materials from Subcontractor to the Contractor).

13. Where the Contractor, with the approval of the Commissioner, has purchased unusually large quantities of materials in order to assure their availability for the work, the Commissioner, at the Commissioner's option, may waive the requirements of Paragraph 12 provided the Contractor furnishes evidence in the form of an affidavit from the Contractor in quadruplicate, and such other proof as the Commissioner may require, that the Contractor is the sole owner of such materials and has purchased them free and clear of all liens and other encumbrances. In such event, the Contractor will pay for such materials and submit proof thereof, in the same manner as provided in Paragraph 12 hereof, within seven (7) days after receipt of payment therefore from the Comptroller. Failure on the part of the Contractor to submit satisfactory evidence that all such materials have been paid for in full, will preclude the Contractor from payments under the Contract.

14. The Contractor must include in each succeeding partial estimate requisition a summary of materials stored which must set forth the quantity and value of materials in storage, on or off the site, at the end of each preceding estimate period; the amount removed for incorporation in the Work; the quantity and value of materials delivered during the current period and the total value of materials on hand for which payment thereof will be included in the current payment estimate.

15. Upon proof to the satisfaction of the Commissioner of the actual cost of such materials and upon submission of proper proof of title as required under Paragraph 12 or Paragraph 13 hereof, payment will be made therefore to the extent of 85%, provided however, that the cost so verified, established

and approved must not exceed the estimated cost of such materials included in the approved detailed breakdown estimate submitted in accordance with Article 41 of the Contract; if it does, the City will pay only 85% approved estimated cost.

16. Upon the incorporation in the Work of any such materials, which have been paid for in advance of such incorporation in accordance with the foregoing provisions, payment will be made for such materials incorporated in the Work pursuant to Article 42 of the Contract, less any sums paid pursuant to Paragraph 15 herein.

F. Transmittal: Submit one signed and notarized electronic PDF copy of each payment requisition to Commissioner by email or as directed.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. MOBILIZATION PAYMENT – A line item for mobilization must be allowed on the Contractor's Detailed Bid Breakdown submitted in accordance with Article 41 of the Contract. The Mobilization Payments are intended to include the cost of required bonds, insurance coverage, and/or any other expenses required for the initiation of the Contract Work. All costs for mobilization will be deemed included in the total Contract Price. The Detailed Bid Breakdown must reflect, and the Mobilization Payment will be made, in accordance with the following schedule:

Contract Bid Amount	Initial Mobilization Payment	Remaining Mobilization Payment	Total Mobilization Payment (Initial Mobilization Payment + Remaining Mobilization Payment)
$0 - $10,000,000	1% of contract bid amount	7% of contract bid amount	8% of contract amount
$10,000,001 - $50,000,000	1% of contract bid amount	7% on the first $10,000,000 plus 3% of the contract bid amount greater than $10,000,000	8% on the first $10,000,000 plus 4% of contract amount greater than $10,000,000
Over $50,000,000	$500,000	$1,900,000	$2,400,000

1. Upon issuance of the Notice to Proceed, the Contractor may requisition for the Initial Mobilization Payment upon submission and approval of all required insurance certificates and bonds.

2. The Contractor may requisition for the Remaining Mobilization Payment upon satisfactory completion of the following items:

a. DDC approval of the Detailed Bid Breakdown per Article 41 of the Contract;

b. Selection and DDC approval of any required field office location(s);

c. Submission of all required insurance certificates and bond;

d. Approval of the Site Safety Plan per the Safety Requirements Section of the Information for Bidders;

e. Approval of the Progress Schedule;

f. Approval of the Schedule Submittal; and,

g. Submission of the Pre-Construction Photographs.

3. The Contractor will not be entitled to a Mobilization Payment that exceeds the Total Mobilization Payment specified in the chart above for the applicable Contract Bid Amount.

H. PAYMENT OF ALLOWANCES:

1. Unless otherwise called for in the Specifications, the following requirements apply to the payment and execution of Allowances established in the Contract:

a. Allowances are to be utilized when ordered and authorized in writing by the Commissioner.

b. The Contractor will be paid on a time and materials (T&M) basis under the Allowance, in accordance with the requirements of Standard Construction Contract Article 26.

I. Payment Requisition at Substantial Completion: Request for Substantial Completion Payment must be submitted in accordance with Article 44 of the Contract.

1. After Commissioner issues the Certificate of Substantial Completion, submit a payment requisition for Substantial Completion payment in compliance with Article 44 of the Contract.

2. Include documentation supporting that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

a. Complete administrative actions, submittals, and Work for Substantial Completion, as described in Section 01 77 00 CLOSEOUT PROCEDURES.

3. This payment requisition must reflect any Occupation or Use Prior to Completion per Article 16 of the Standard Construction Contract.

J. Final Payment Application: After completing Project closeout requirements, submit a payment requisition for Final Acceptance payment in compliance with Article 45 of the Contract.

1.6 PAYMENTS TO M/WBE SUBCONTRACTORS

A. The Department of Design and Construction (“DDC”) is committed to supporting the growth and success of Minority and Women-owned Business Enterprises (“M/WBE”). In furtherance of this goal, DDC complies with NYC Administrative Code section 6-129, as amended. In order to support the growth and success of M/WBEs on all DDC projects, it is important that M/WBE vendors that are sub-contractors (any tiers) are treated fairly at all times and that their payment requisitions / invoices are handled in accordance with the City’s Standard Construction Contract. Pursuant to the Standard Construction Contract, prime contractors are required to pay Subcontractors within thirty (30) days of receipt of such funds from DDC. Failure to comply with the Standard Construction Contract and the goals established by DDC as it applies to M/WBEs, may result in financial sanctions and negative performance evaluations, which will be taken into consideration on future procurements.

PART II - PRODUCTS (Not Used)

PART III - EXECUTION (Not Used)

END OF SECTION 01 29 00

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. LEED: Refer to the Addendum to identify whether this Project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

C. COMMISSIONING: Refer to the Addendum to identify whether this Project will be commissioned by an independent third party under separate contract with the City of New York (City). Commissioning will be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS, and/ or Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE COMMISSIONING. The Contractor must cooperate with the commissioning agent and provide whatever assistance is required.

1.2 SUMMARY:

A. This Section includes administrative provisions for coordinating construction operations on the Project, including:

1. Coordination Drawings
2. Administrative and supervisory personnel
3. Project meetings
4. Requests for Interpretation (RFIs)

B. This Section includes the following:

1. Definitions
2. Coordination
3. Submittals
4. Project Meetings
5. Requests for Interpretation (RFI’s)
6. Correspondence
7. Contractor’s Daily Reports

C. Related Sections:

1. Section 01 10 00 SUMMARY
2. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
3. Section 01 33 00 SUBMITTALS
4. Section 01 35 26 SAFETY REQUIREMENTS
5. Section 01 73 00 EXECUTION REQUIREMENTS
6. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
7. Section 01 77 00 CLOSEOUT PROCEDURES

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 COORDINATION:

A. Coordination: The Contractor must coordinate its construction operations, including those of its Subcontractors, with other entities to ensure the efficient and orderly installation of each part of the Work. The Contractor must coordinate the various operations required by different Sections of the Specifications that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence in order to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum access for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and access for required maintenance, service, and repair of all components, including mechanical and electrical.

B. The Contractor must prepare memoranda for distribution to its Subcontractors and other involved entities, outlining special procedures required for coordination. Such memoranda must include required notices, reports, and meeting minutes as applicable.

C. Administrative Procedures: The Contractor must coordinate scheduling and timing of required administrative procedures with other construction activities and activities of its Subcontractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include without limitation the following:

1. Preparation of Contractor's Construction Schedule.
2. Installation and removal of temporary facilities and controls.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Pre-installation conferences.
6. Startup and adjustment of systems.
7. Project closeout activities.

D. Conservation: The Contractor must coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

E. Salvaged Items, Material and/or Equipment: The Specifications may identify certain items, materials or equipment which must be salvaged by the Contractor and handled or disposed of as directed. The Contractor must comply with all directions in the Specifications regarding the salvaging and handling of identified items, material or equipment.

F. Software: The Contractor may be required by the Commissioner to utilize a designated cloud-based Construction Management Tool to streamline and manage activities, including but not limited to the following:
   1. Submittals;
   2. Drawings, Specifications, and Bulletins;
   3. RFI's;
   4. Progress Photographs;
   5. Letters and Correspondence;
   6. Punchlists and Closeout Management;
   7. Daily Logs;
   8. Meetings and Minutes; and/or,
   9. Change Order log memos.

1.5 SUBMITTALS:

A. Submit shop drawings, product data, samples etc., in compliance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. Coordination Drawings: The Contractor must prepare applicable Coordination Drawings in compliance with the requirements for Coordination Drawings in Section 01 33 00 SUBMITTAL PROCEDURES.

C. Safety Plan in compliance with Section 01 35 26 SAFETY REQUIREMENTS PROCEDURES.

D. Waste Management Plan in compliance with Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

E. Key Personnel Names: Within fifteen (15) Days after the Notice to Proceed (NTP), the Contractor must submit a list of key personnel assignments of the Contractor and its Subcontractors, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in case of the absence of individuals assigned to Project.

   1. Post copies of the list in Project meeting room, in temporary field office, and by each temporary telephone. Keep the list current at all times.

   2. In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work. Include special personnel required for coordinating all operations by its Subcontractors.

1.6 PROJECT MEETINGS:

A. General: The Commissioner will hold regularly scheduled construction progress meetings at the site, at which time the Contractor and appropriate Subcontractors must have their representatives present to discuss all details relative to the execution of the work. The Commissioner will preside over these meetings.

   1. Agenda: Prior to each meeting, the Commissioner will consult with the Contractor and will prepare an agenda of items to be discussed. In general, after informal discussion of any item on the agenda, the Commissioner will summarize the discussion in a brief written statement, and the Contractor will then dictate a brief statement for the record.

   2. Coordination: In addition to construction progress meetings called by the Commissioner, the Contractor must hold regularly scheduled meetings for the purpose of coordinating, expediting and scheduling the work in accordance with the master coordinated Job Progress Chart. The Contractor and its Subcontractors, material suppliers or vendors whose presence is necessary, are required

to attend. These meetings may, at the discretion of the Contractor, be held at the same place and immediately following the Project meetings held by the Commissioner. Minutes of these meetings must be recorded, typed and printed by the Contractor and distributed to all parties concerned.

B. Preconstruction Kick-Off Meeting:

1. The Commissioner will schedule a preconstruction kick-off meeting either at DDC's main office or at the Project site to review responsibilities and personnel assignments and clarify the role of each participant. Unless otherwise directed, the Design Consultant will record and distribute meeting minutes.
2. Attendees: Authorized representative of the Sponsor Agency; Design Consultant; the Contractor and its superintendents, Subcontractor(s) and their superintendent(s); LEED sub-consultant and Commissioning Authority /Agent (CxA) as applicable and other concerned parties. All participants at the meeting must be familiar with the Project and authorized to conclude matters relating to the Contract Work.
3. Agenda: Includes without limitation the following as applicable:
   a. Establishing construction schedule;
   b. Schedule for regular construction meetings;
   c. Phasing;
   d. Critical Work sequencing and long-lead items;
   e. Designation of key personnel and their duties;
   f. Reviewing application for payment and change order procedures;
   g. Procedures for RFIs;
   h. Review permits and approval requirements;
   i. Review all recent administrative code reporting requirements relating to the Project, (i.e. LL 77, LL86 etc.);
   j. Procedures for testing and inspecting;
   k. Reviewing special conditions at the Project site;
   l. Distribution of the Contract Documents;
   m. Submittal procedures;
   n. Safety procedures;
   o. LEED requirements;
   p. Commissioning requirements;
   q. Preparation of record documents;
   r. Historic Treatment requirements;
   s. Use of the premises;
   t. Work restrictions;
   u. Sponsor Agency occupancy requirements;
   v. Responsibility for temporary facilities, services, and controls;
   w. Construction Waste Management and Disposal;
   x. Indoor Air Quality Management Plan;
   y. Dust Mitigation Plan;
   z. Office, work, and storage areas;
   aa. Equipment deliveries and priorities;
   bb. Security;

cc. Progress cleaning; and,
dd. Working hours;

C. Construction Progress Meetings:
1. The Commissioner will schedule and conduct construction progress meetings at bi-weekly intervals or as otherwise determined. All participants at the meeting must be familiar with the Project and authorized to conclude matters relating to the Work. Unless otherwise directed, the Design Consultant will record and distribute meeting minutes.
2. Attendees:
a. Design Consultant and applicable sub-consultants;
b. Sponsor Agency Representative;
c. Representatives from the Contractor, sub-contractor(s), suppliers or other entities involved in the current progress, planning, coordination or future activities of the Work; and,
d. Other appropriate DDC personnel, DDC consultants and concerned parties.
3. Agenda: Includes without limitation the following:
a. Review the Construction Schedule and progress of the Work. Determine if the Work is on time, ahead of schedule or behind schedule. Determine actions to be taken to maintain or accelerate the schedule;
b. Review and approve prior meeting minutes and follow up open issues;
c. Coordinate work between each Subcontractor;
d. Sequence of Operations;
e. Status of submittals, deliveries, and off-site fabrication;
f. Status of inspections and approvals by governing agencies;
g. Temporary facilities and controls;
h. Review Site Safety;
i. Quality and work standards;
j. Field observations;
k. Status of correction of deficient items;
l. RFI’s;
m. Pending changes;
n. Status of outstanding payments and change orders;
o. LEED requirements including Construction Waste Management, Indoor Air Quality Plan, Dust Mitigation and Commissioning; and,
p. Status of Administrative Code reporting requirements related to the Project.

D. Preinstallation Conferences:
1. The Contractor will conduct a preinstallation conference at project site before each construction activity when required by other specification Sections and when required for coordination with other construction.
2. Attendees:
a. Contractor and its superintendents
b. Applicable Subcontractor(s)
c. Representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will

follow.

3. Advise the Commissioner of scheduled preinstallation conference meeting dates.
4. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
   a. Contract Documents
   b. Related RFI's
   c. Deliveries
   d. Submittals
   e. Review of mockups
   f. Possible conflicts
   g. Compatibility requirements
   h. Time schedules
   i. Weather limitations
   j. Manufacturer's written instructions
   k. Warranty requirements
   l. Compatibility of materials
   m. Acceptability of substrates
   n. Temporary facilities and controls
   o. Space and access limitations
   p. Testing and inspecting requirements
   q. Installation procedures
   r. Coordination with other work
   s. Required performance results
   t. Protection of adjacent work

1.7 REQUESTS FOR INFORMATION (RFI):

A. Procedure: Immediately on discovery of the need for information or interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, the Contractor must prepare and submit an RFI in the form specified by the Commissioner.

1. RFI must originate with the Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. Coordinate and submit RFI in a prompt manner to the Commissioner so as to avoid delays in Contractor's Work or Work of its Subcontractors.
3. RFI Log: The Contractor must prepare, maintain, and submit a tabular log of RFIs organized by the RFI number monthly to the Commissioner, or more frequently if directed by the Commissioner.
4. On receipt of responses and action to the RFI, the Contractor must update the RFI log and immediately distribute the RFI response to affected parties. Review response(s) and notify the Commissioner immediately if the Contractor disagrees with response(s).

1.8 CORRESPONDENCE:

A. Copies of all correspondence to DDC must be sent directly to the Commissioner at the job site.

1.9 CONTRACTOR'S DAILY REPORTS:

A. The Contractor must prepare and submit Daily Construction Progress Reports as outlined in Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required Work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for establishing an effective base line schedule for the Project and documenting the progress of construction during performance of the Work by developing and revising as necessary, various documents including but not limited to the following:
   1. Submittals schedule
   2. Daily construction reports
   3. Material location reports
   4. Field condition reports
   5. Special reports

B. RELATED SECTIONS:

1.	Section 01 10 00	SUMMARY
2.	Section 01 32 22	PHOTOGRAPHIC DOCUMENTATION
3.	Section 01 32 16.10	PROJECT SCHEDULES (METHOD A)
4.	Section 01 32 16.20	PROJECT SCHEDULES (METHOD B)
5.	Section 01 32 16.30	PROJECT SCHEDULES (METHOD C)
6.	Section 01 33 00	SUBMITTAL PROCEDURES
7.	Section 01 40 00	QUALITY REQUIREMENTS

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

PART II – PRODUCTS

2.1 SUBMITTALS SCHEDULE:

A. Preparation: The Contractor must submit a schedule of submittals, arranged in chronological order by dates required by the construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates. The Submittals Schedule must show all of the following types of submittals:

1. Shop and Coordination Drawings
2. Material Samples
3. Catalog Cuts
4. Test and Evaluation Reports
5. Field Test Reports
6. Sample Warranties
7. Certificates
8. Qualification Data
9. Closeout Submittals

B. Submittals: At the kick-off meeting, the Contractor must have a preliminary Submittals Schedule, and must review this Schedule with the Commissioner. Within ten (10) Days after the kick-off meeting, the Contractor must complete the Submittals Schedule, including all submission dates, required delivery dates, and fabrication times. The Contractor must include an updated Submittals Schedule with all Progress Payment applications.

C. Review: The Commissioner will review the Submittals Schedule submitted by the Contractor. Upon acceptance, the Commissioner will date and sign the schedule as approved and transmit it to the Design Consultant, Contractor, and others within DDC as the Commissioner deems appropriate. If so directed by the Commissioner, the Contractor must revise the Submittals Schedule to indicate a submission date for specified shop drawings and/or material samples within sixty (60) Days after the kick-off meeting. The Contractor must resubmit the Submittals Schedule as necessary to include all review comments.

2.2 REPORTS:

A. Daily Construction Reports: The Contractor must submit to the Commissioner written Daily Construction Reports at the end of each day that work was performed, recording basic information such as the date, day, weather conditions, and contract days passed, remaining contract duration/days and the following information concerning the Project.

Information: The reports must be prepared by the Contractor's Superintendent and must bear the Contractor's Superintendent's signature. Each report must contain the following information:

1. List name of Contractor, Subcontractors, their work force in each category, and details of activities performed;
2. The type of materials and/or major equipment being installed by the Contractor and/or by each Subcontractor;
3. The major construction equipment being used by the Contractor and/or Subcontractors;
4. Material and Equipment deliveries;
5. High and low temperatures and general weather conditions;
6. Accidents;
7. Meetings and significant decisions;
8. Unusual events;
9. Stoppages, delays, shortages, and losses;
10. Meter readings and similar recordings;
11. Emergency procedures;

12. Orders and/or requests of authorities having jurisdiction;
13. Approved Change Orders received and implemented;
14. Field Orders and Directives received and implemented;
15. Services connected and disconnected;
16. Equipment or system tests and startups;
17. Digital photographs (cell phone quality, 5 megapixel minimum) of the work being performed, and of any issues;
18. Partial Completion(s) and occupancies; and,
19. Substantial Completion(s) authorized;

NOTE: If there is NO ACTIVITY at site, a daily report indicating so and the reason for no activity at the site must be submitted.

B. Material Location Reports: The Contractor must submit a Material Location Report at weekly OR monthly intervals as determined and established by the Commissioner. Such report must include a comprehensive list of materials delivered to and stored at Project site. List must be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit a Request For Information (RFI) form with a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.3 SPECIAL REPORTS:

A. Accident report, incident report, special condition report for the conditions out of control of any party involved with the Project effecting Project progress, explaining impact on the Project schedule and cost if any.

PART III – EXECUTION (Not Used)

END OF SECTION 01 32 00

SECTION 01 32 16.10
PROJECT SCHEDULES (METHOD A)

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 16.10

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:

1. Methods
2. Definitions
3. Preliminary, Baseline, and Project Schedule Preparation Timeline
4. Preliminary Project Schedule Development
5. Project Schedule
6. Activity and Calendar Coding Structure
7. Work Breakdown Structure (WBS)
8. Major Milestones
9. Short (Three-Week) Interval/Two-Week Look-Ahead
10. Submittals
11. Project Schedule Updating
12. Time Impact Analysis

1.3 METHODS:

A. The Contractor must comply with Project schedule development and updating requirements as specified herein.

1. The Contractor must employ or retain the services of a Construction Scheduler with verifiable construction scheduling experience, subject to review and acceptance by the City. Upon request, the Contractor must provide the City with details of qualifications and experience of the proposed scheduling staff member(s).

2. The Contractor must prepare, update, and maintain a detailed Project Schedule using a version of scheduling software that is compatible with the City's Oracle Primavera P6 Enterprise Project Portfolio Management (EPPM). All schedule submittals must be developed using Oracle's Primavera P6 EPPM software. Schedules must be developed using accepted CPM techniques using the precedence diagramming method (PDM). The Project Schedule must be developed following Defense Contract Management Agency (DCMA) and American Association of Cost Engineering International (AACE International) guidance. The Contractor will be required to use the Contractor's

own P6 license (whether single-user or Enterprise license), unless otherwise directed by the Commissioner. If directed by the Commissioner prior to the Notice to Proceed (NTP), the Contractor must use the Department's P6 Enterprise license and develop the Progress Schedule within the Department's Enterprise environment.

3. Once the Baseline Schedule is accepted by the City, progress updates to the Project Schedule must be submitted monthly, unless otherwise directed by the City, until Substantial Completion. The Data Date for the schedule updates must use the last Friday of the month, or as directed by the City.

4. The Contractor will be responsible for providing the monthly schedule updates once the Baseline Schedule is approved. Each monthly schedule update must be accompanied with a schedule narrative that explains the following:

    a. The progress of work during that particular period of performance,
    b. Any changes in schedule Logic,
    c. The physical conditions that were used to update every Activities Percent Complete,
    d. Any change in actual Start and Finish Dates,
    e. Any Duration changes,
    f. Any added and deleted Activities, and
    g. Any added Extra Work (e.g. change orders).

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	**Definition**
Activity	A representation of a discrete portion of the overall scope of Work or an event through Duration and description in a CPM schedule.
Baseline Schedule	The planned and detailed CPM schedule of Activities, including all Logic, Durations, Resource and Cost Loading, and showing the entire scope of Work. The Baseline Schedule must be accepted by the City.
Critical Path	The longest sequence of Activities in a network which establishes the minimum length of time for accomplishment of the end event of the Project.
Critical Path Method (CPM)	A management technique used to plan and control a Project which combines all relevant information into a single plan defining the sequence and Duration of operations and depicting the interrelationship of the Work elements required to complete the Project.
Current Schedule	The most recently updated schedule that captures progress to date and forecasts the dates for each Activity.
Data Date	The date used as a starting point for scheduling calculations. The Data Date is changed to the current end of period date when a schedule is updated for progress.
Duration	The amount of time, in workdays, an Activity will take to perform.

Term	Definition
Finish Date	The earliest estimated date an Activity is calculated to be complete, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Free Float	The calculated amount of time that the estimated start or finish of an Activity can be delayed without impacting the start or finish of other downstream Activities logically connected in a progressive relationship. (See Finish Date and Late Finish).
Fragnet	Fragmentary network: a portion of a schedule detailing impacts of an event on specific Activities in the broader schedule.
Inclement Weather	Any weather condition, the duration of which varies in excess of the 3-year average published by the National Oceanic and Atmospheric Administration (NOAA) information for the local area.
Integrated Project Schedule	The Commissioner's overall schedule covering design, procurement and construction. The Commissioner will use the Contractor's Project Schedule to update the Integrated Project Schedule.
Late Finish	An estimate of the latest plausible date an Activity's completion can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Late Start	An estimate of the latest plausible date an Activity's start can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Logic	A direct progressive relationship between Activities where one Activity's performance restricts the performance of another Activity.
Milestone	A key or critical point in time for reference or measurement.
Network Diagram	A graphic diagram of a network schedule, showing Activities and Activity relationships.
Original Duration	The estimated amount of time, in Work Days, an Activity is expected to take to complete at the beginning of a Project as anticipated by the Contractor based on its planned means and methods at time of bid and documented in the Baseline Schedule.
Percent Complete	The percentage of the scope of Work represented by an Activity completed as of the Data Date calculated as physical percent complete for payment purposes.
Project Schedule	The Contractor's schedule used to manage the orderly and expeditious completion of the Work. The Project Schedule is initially the accepted Baseline Schedule, and is updated throughout the Project.
Remaining Duration	The amount of time, in Work Days, the remaining scope of Work represented by an Activity is expected to take to complete, measured from the current Data Date.

Term	Definition
Resource and Cost Loading	Values assigned for estimated dollars, manpower, equipment and/or materials necessary to complete the scope of Work represented by a specific Activity.
Recovery Schedule	A Recovery Schedule outlining and incorporating extraordinary efforts required to recover lost time with the aim of achieving completion of the Project within the stipulated contract Duration, plus authorized time extensions. In such case, special attention must be given to minimize delays as much as possible and must establish the nature of efforts; for instance, resources and equipment required, extended hours of work, weekend work, accelerated fabrication, required action(s) or effort(s) by the Contractor, its Subcontractors, consultants, clients, end users and/or other concerned parties to recover the schedule.
Revised and/or Updated Schedule	A Baseline Schedule, Progress Project Schedule, or Recovery Schedule for the Project that shows the actual Duration of all the completed Activities, including Duration of and the reasons for delays, if any has occurred, AND revisions to all remaining Activities of the Contractor and its Subcontractors, including changes, if any, to logical ties, interrelations and the sequence of each of the outlined Activities. Any such revisions should be shown on the row just below the approved schedule of the respective Activity so that revisions can be compared. The Revised and/or updated Schedule must be reviewed and approved by the City.
Start Date	The earliest estimated date an Activity is calculated to begin, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Time Impact Analysis	A forward looking (prospective) schedule analysis used to forecast the impact to the Critical Path and to Milestone Finish Dates caused by a single event or series of events. Time Impact Analysis is not a retrospective (forensic) schedule analysis or a what-if schedule analysis of a potential event.
Total Float	The amount of time the start or finish of an Activity can be delayed without affecting the Project completion date.
Work Breakdown Structure (WBS)	WBS is a deliverable-oriented decomposition of a Project into smaller components. A WBS provides the necessary framework for detailed cost estimating and control along with providing guidance for schedule development and control.
Work Days (WD)	Work Days are every consecutive day in the calendar, excluding weekends (Saturday and Sunday) and holidays.

1.5 PRELIMINARY, BASELINE, AND PROJECT SCHEDULE PREPARATION TIMELINE:

A. Upon receipt of the NTP, the Contractor must promptly prepare a preliminary Project Schedule and subsequently a Baseline Schedule and must submit for the City's acceptance as follows:

1. The preliminary Project Schedule must be submitted no later than fifteen (15) Days after NTP.
2. The initial submittal of the Baseline Schedule must be provided to the City for review no later than thirty (30) Days after NTP.

3. The Contractor must incorporate all corrections and revisions required by the City and provide an updated version of the Baseline Schedule for review and acceptance no later than sixty (60) Days after NTP to ensure that the Baseline Schedule is accepted. The sixty (60) Days must include fourteen (14) Days review times for each submittal of the Baseline Schedule.
4. Once accepted, the Baseline Schedule will be the basis of Project Schedule updates.

1.6 PRELIMINARY PROJECT SCHEDULE DEVELOPMENT:

A. The preliminary Project Schedule must be a detailed plan (division level per Construction Specifications Institute (CSI) MasterFormat) of all operations, including submittals, permitting, testing, and construction Activities, for either the first ninety (90) Days after NTP or to the point where the Contractor plans to mobilize on site (whichever is greater). This submittal will also depict a summary level (section level per CSI MasterFormat) schedule of the major Activities for the remainder of the Work.

1. All Activities for Contractor mobilization, procurement, and construction Activities within the first sixty (60) Days, including permits and submittals. All remaining work forecasted after the first sixty (60) Days must be summarized through the Contract's completion date.
2. All submittal and procurement Activities for long lead items.
3. The Project's Critical Path.
4. An electronic copy of the schedule in either MS Project (.MPP) or Primavera P6 Professional Format (.XER).

B. The preliminary Project Schedule will be reviewed by the City and returned with comments, as necessary, within fourteen (14) Days of submittal receipt. Information from the preliminary Project Schedule will be the general foundation for development of the Baseline Schedule.

1.7 PROJECT SCHEDULE:

A. The Baseline Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

B. After the Baseline Schedule is approved, the Project Schedule must be the Contractor's working schedule and must be used to plan, organize, execute, and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor's execution plan to complete the Work.

C. The Project Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

D. The Project Schedule must be the Contractor's working schedule used to plan, organize, execute, and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor's execution plan to complete all remaining Work.

E. All delay claims must be based on the current approved updates of the Project Schedule.

F. The Contractor must confirm in writing that all Subcontractors performing any portion of the Work are in agreement with the accepted Baseline Schedule and the monthly updates.

G. The amount of detail represented in the Baseline and Project Schedule and supporting documents submitted must, at a minimum, include the following items:

1. Contract Milestones must be identified and included in the Baseline and Project Schedule.
2. All submittal, owner review & approval, purchase, manufacture, and delivery Activities for all major materials and equipment.
3. Deliveries of owner-furnished equipment and/or materials.
4. Preparation, submittal, and approval of drawings, material samples, and safety plans.
5. Preparation, submittal, review, and approval of permits required by all regulatory agencies and other third parties.
6. Performance of tests, submission of test reports, and approval of test results.
7. Commissioning Activities for all commissioned systems and equipment is to be clearly delineated and scheduled such that they will be completed prior to Substantial Completion. Such Activities must include, at a minimum, Pre-Functional testing and check sheets; Testing, Adjusting, and Balancing (TAB) verification; Functional Testing, including testing of all controls; and Owner's demonstration and orientation.
8. Completion dates of all items required for phased completion (if applicable).
9. Completion dates of all items required for Substantial Completion.
10. Completion dates of all items required to obtain a Temporary Certificate of Occupancy (TCO) and Certificate of Occupancy (CO).
11. Completion dates for close-out of regulatory and punch list items prior to Final Acceptance and transfer of the Project.
12. Any additional detail requested by the Commissioner.

H. Activities identified in the Baseline and Project Schedule must have the Duration in units of whole Work Days. Construction Activity Durations must not exceed twenty (20) Work Days unless specifically approved by the City. This is to ensure that Activities are not generalized and that each Activity and sub-Activity are defined as narrowly as reasonable to facilitate schedule tracking. Durations for non-construction Activities such as procurement of materials, delivery of equipment, concrete curing, etc., may exceed twenty (20) Work Days without prior approval; however, these are still subject to review by the City. Durations must be based on the available resources required for performing each Activity and must be the result of definitive labor hours using established production rates, and with consideration of on-site working conditions. If requested by the City, the Contractor must justify the reasonableness of a planned Duration.

I. Activity descriptions must use plain language that clearly and uniquely defines each Activity. Each description must include a verb or work function (e.g. submit, form, pour, etc.), an object (e.g. slab, foundation, etc.) and, for any construction Activities, a specific location. The Work related to each Activity must be limited to one responsibility and one trade.

J. Activity relationships must be assigned to clearly establish predecessor and successor relationships to each Activity. Open-ended Activities are not permitted with the exception of the first and last Activity in the network, the first Activity being NTP and the last being Final Acceptance. The use of relationship lag times is discouraged and only permitted with prior approval by the City. The use of negative lag is never permitted.

K. Activity constraint dates are only to be used to reflect contractual constraints unless specifically authorized by the City.

L. Float or slack, in any schedule, must not be for the exclusive use or benefit of either the City or the Contractor, but must be available for use by both the City and the Contractor.

M. Each resubmittal after the Project Schedule is delivered for acceptance must comply with all requirements of this section. Review and response by the City will be given within fourteen (14) Days after resubmission. The Contractor's receipt of the comments within the time specified must not, in any way, affect the Contractor's responsibility to complete the Project within the time fixed in Schedule A.

N. Failure by the City to return comments or indicate acceptance status will in no way relieve the Contractor's obligation to submit monthly schedule updates.

O. At the request of the City, the Contractor must be required to make a presentation to explain or clarify the intended logical sequence of construction Activities depicted in the detailed Project Schedule. The Contractor and designated scheduler must discuss anticipated challenges and outline construction methodology and flow of work to show how and when major Milestones will be achieved. In addition, the Contractor may, at no cost to the City, be required to participate in additional Project meetings necessary to obtain acceptance of the above-noted submittals.

1.8 ACTIVITY AND CALENDAR CODING STRUCTURE:

A. The Baseline and Project Schedules must contain a sufficient number of Activities to represent adequate planning and execution of the Work so that it shows an accurate flow of work and demonstrates an understanding of the Project by the Contractor.

B. Activity ID and Calendar Coding

1. The Contractor's proposed Activity and calendar coding and must be submitted with the preliminary Project Schedule. A meeting may be requested by the City to discuss the scheme and other schedule information prior to the submittal of the Project Schedule. The accepted coding scheme and WBS Structure must be incorporated into the Project Schedule.

C. Activity ID Coding

1. All Activities/ Resources/ Calendars (Baseline and Project Schedules) must be coded inside the P6 Project Environment / Project Level (NOT the Global Environment/ Enterprise Level) to facilitate selection, sorting and preparation of reports.

2. Activity coding must consist of the Project ID followed by a dash, followed by Activity coding (PROJECT ID-ACTIVITY CODE). Activity codes must be created at the Project level and must utilize the coding scheme outlined in the table below:

Activity Code	Meaning
RESP	Responsibility: Identify the party (e.g. Contractor, Subcontractor, City, etc.) responsible for the Activity.
PHAS	Phase: Breakdown of Activities in Milestones, pre-construction, procurement, construction and close-out Activities.
LOCN	Location: Breakdown by floor or elevation.
AREA	Area: Breakdown by room, area, block or wing. May be used as a subdivision of PHAS to include Milestones, permits, Subcontractor approvals, submittals, fabrication and delivery, and subdivision of the Site and buildings into Logical modules, such as by blocks, wings, etc.
TRAD	Trade: Breakdown by CSI Code or section number in the Specifications.

a. Description of schedule Activities must include terminology that represents the scope of work associated with that particular Activity. Terminology used to describe similar actions must be consistent across all segments of work.

b. Naming convention for schedule Activities must be descriptive and indicate the associated work covered by the Activity. Activities must use a verb, noun, and location of the work in the Activity name.

3. Project Calendar Coding

   a. All calendars created and assigned to Activities must be Project-level calendars. The Calendar Name must consist of the Project ID number followed by a dash, followed by a descriptive Calendar Name (PROJECT ID-CALENDAR NAME).

1.9 WORK BREAKDOWN STRUCTURE:

A. Structure must be submitted with the preliminary Project Schedule. The levels (nodes) must include, but not be limited to:

   1. LEVEL 01 – The Project Level.

   2. LEVEL 02 – Contains a minimum of four (4) nodes: Pre-Construction, Procurement, Construction or Phase of Construction, and Closeout.

   3. LEVEL 03 – Decomposition of each of the four (4) nodes in Level 02 into its constituent parts. This level must target specific, tangible, deliverable scopes of Project Work.

B. The Contractor's proposed WBS must be submitted with the preliminary Project Schedule. The accepted WBS Structure must be incorporated into the Baseline and Project Schedule.

1.10 MAJOR MILESTONES:

A. The schedule must include both contractual and non-contractual Milestones that are provided by the City. These Milestones must be properly associated with the related Work and maintained to represent the progress of the Project.

1.11 SHORT (THREE-WEEK) INTERVAL / TWO-WEEK LOOK-AHEAD:

A. On a bi-weekly basis, the Contractor must provide a three (3) week short interval schedule in a format satisfactory to the City. The purpose of this schedule is to report the actual progress of the past week against the previous short interval look-ahead Activities and add any additional Activities planned for the next two (2) weeks. Electronic files and hard copies must be provided to the City on the first day of each work week with the prior week's actual progress included.

B. Each task listed on the short interval schedule must be representative of the most current Project Schedule Update and include a reference to an Activity shown on the current update.

C. The short interval schedule must list all required DDC coordinated activities, including special inspections.

1.12 SUBMITTALS:

A. General

   1. Development of the Baseline Schedule and updating of the Project Schedule must follow the DCMA and AACE International guidelines.

   2. Each electronic submission of the Project Schedule must be assigned a unique file name consisting of the Project ID (as noted on the NTP followed by a dash followed by a unique file name clearly marked (i.e. ProjID- B000 = B/L rev0, ProjID-B001 = B/L rev01 etc.) to indicate the specific submission. Similarly, update submittals must be named ProjID-Uxxx where xxx is a sequential number, starting with 001, indicating the revision or issue number.

3. The Contractor must provide all submittals in electronic format and two hard copies.

B. Preliminary Project Schedule

1. For acceptance of the preliminary Project Schedule, the Contractor must submit the following:

a. Two (2) 11" x 17" hard copies of the proposed preliminary Project Schedule, as well as the native electronic schedule data file, in .XER file format, per the direction of the City.

b. A Schedule Narrative Report detailing the Contractor's initial plan for executing the Contract work within the allotted Contract Duration, and include the following explanation of their provided preliminary schedule:

i. The proposed WBS;
ii. All proposed Project Calendars;
iii. All proposed Activity Codes, clearly defined;
iv. The proposed Activity ID format; and
v. Schedule basis narrative, which must memorialize assumptions made in the development of the schedule.

C. Baseline Schedule

1. The City will normally return comments within ten (10) Work Days after receipt of the initial Project Schedule Submission. If any of the required submissions are returned to the Contractor for corrections or revisions, they must be resubmitted within five (5) Work Days from receipt of comments. Each resubmittal must comply with the requirements enumerated above. Review and response by the City will be given within ten (10) Work Days after resubmission.

2. At the request of the City, the Contractor will be required to participate in Project meetings necessary to obtain an acceptance of the above noted submittals.

3. Baseline Schedule submittal must contain a Narrative Report. It must include the following, or as directed by the City:

a. A description of the Project scope and how the Work is represented in the schedule Activities;

b. A description of the overall sequence of major components of Work;

c. Planned work week for each definable feature of work;

d. Description of the Critical Path and near Critical Paths;

e. How weather will be accommodated in the schedule, including a description of the weather calendar and the Activities it is applied to, and the NOAA Inclement Weather data that defined the number of non-work days;

f. How regulatory, operational or third-party constraints are accommodated in the schedule;

g. Description of key Project coordination points or events;

h. Discussion of long lead items and basis of time frames for submittals; and

i. Potential opportunities and risks, including quantification of the schedule reduction or expansion.

D. Project Schedule Updates

1. Every schedule submittal must be provided with a corresponding narrative. These schedule submittals and narratives are to be submitted in hard copy, as well as in the native electronic

format, as attachments to emails or other media accepted by the City. When opened, the electronic format must provide flawless restoration of the native files (P6 (.XER) for Primavera and MS Word and/or Adobe Acrobat for Narrative and supporting document submittals).

2. For each submittal of the updated Project Schedule, the following layouts, reports, and graphics are required in the specified formats, unless otherwise directed by the City:

   a. The Contractor must furnish two (2) 11” x 17” color hard copies of the complete progress schedule with each initial schedule update and final update incorporating comments furnished by the City. Additionally, the Contractor must provide the native electronic schedule data file, in .XER file format with the initial and final schedule update submission.

   b. An Activity bar chart Layout grouped by Activity Code and then sorted by Start Date, Finish Date, and then Total Float.

   c. Each Activity line must display the Activity ID (Act ID), Description (Name), Original Duration (OD), Remaining Duration (RD), Start Date (ES), Finish Date (EF), and Total Float (TF), Baseline Original Duration (BL OD) Baseline Start (BL Start), Baseline Finish (BL Fin), Baseline Total Float (BL TF).

   d. An Activities progress bar must show both current progress update ES and EF, and baseline ES and EF. The top line of the bar chart area must contain the updated ES and EF; the second line below must depict the accepted baseline ES and EF dates.

3. The City may request additional standard P6 reports from time to time at no additional cost.

4. The Monthly Update submittal must contain a Narrative Report. It must include the following, or as directed by the City:

   a. Any changes to the schedule basis narrative;

   b. Overall health of the Project;

   c. Actual Activity Start Dates;

   d. Actual Activity Finish Dates;

   e. The physical conditions that were used to update Activities percent complete;

   f. Percent of Work reported in place;

   g. A description of the overall sequence of major components of Work;

   h. Description of the Critical Path and near Critical Paths;

   i. Description of key Project coordination points or events;

   j. Discussion of long lead items and basis of time frames for submittals;

   k. Potential opportunities and risks, including quantification of the schedule reduction or expansion;

   l. Assumptions/exclusions made in the schedule;

   m. Contract and Milestone completion date status:

      i. Number of Days ahead or behind schedule and; and

      ii. Days lost/gained compared with the previous update.

   n. Lookahead report listing each Activity in the CPM schedule that is scheduled to be performed during the next reporting period;

o. Changes in Activity description, Logic, or Duration must be submitted as a separate Proposed Schedule and approved by the City prior to being submitted as an official update. Once allowed, said changes must be grouped and organized in the report in a manner that communicates in detail the rationale associated with each change and the impact upon construction sequence, relationships and the Critical Path. A standard Digger Report is not sufficient to meet this requirement;

p. Added/deleted Activities and the rationale associated with each action;

q. Pending issues and status of other items;

r. Permits, in a tabular format, showing the status and change in status of all permits;

s. Contract modifications; and

t. Extra Work, including change orders.

1.13 PROJECT SCHEDULE UPDATING:

A. The initial updating must take place immediately after the City accepts the Contractor's Baseline Schedule. The Data Date for the first update must not exceed seven (7) Days from the date of receipt of the accepted Baseline Schedule, or as directed by the City.

B. Subsequent updates of the Project Schedule must be submitted monthly until Substantial Completion. The schedule Data Date must be the last Work Day of the period unless otherwise directed by the City. Updates must be provided to the City no later than seven (7) Days after the 'schedule Data Date'.

C. Updates must reflect actual or reasonably anticipated progress as of the last Work Day of the period.

D. The City may request meetings with the Contractor to review the Project Schedule and narrative and jointly verify Project health and information.

E. In addition, the City may request meetings with the Contractor's scheduling representative to:

1. Resolve out-of-sequence Logic.

2. Should out-of-sequence progress occur where Activities have reported progress without predecessor Activities being completed, the Contractor must obtain the City's approval in a Proposed Schedule before revising the Logic ties to reflect the way the Work is actually being performed. Use of progress override by default mechanisms that may be included in CPM scheduling software systems will not be allowed except on a case-by-case basis with the approval of the City. A written explanation for each instance must be included in the monthly submittal narrative.

3. Assess the impact, if any, of any pending change orders.

4. Incorporate accepted time extensions.

5. Review revised Logic (as-built and projected) and changes in Activity Duration, cost, and labor hours assigned.

F. Contractor's failure to provide required scheduling information within the required timeframe or to adhere to the currently accepted schedule may result in rejection of all or a portion of the progress payment until such time as the required schedule information is submitted and accepted by the City.

G. Delays to the Critical Path – Whenever it becomes apparent from the monthly CPM schedule update that delays to the Critical Path have occurred due to action or inaction of the Contractor, and as a result the date for Substantial Completion will not be met, the Contractor must promptly take some or all of the following actions at no additional cost to the City, unless otherwise directed by the City:

1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of Work.
2. Increase the number of working hours per shift, shifts per day, or Work Days per week; the amount of construction equipment; the forms for concrete work; etc., or any combination of the foregoing to substantially eliminate the backlog of Work.
3. Reschedule Activities to achieve maximum practical concurrence of accomplishment of Activities and comply with the revised schedule.
4. Submit to the City for review a written statement of the steps the Contractor intends to take to remove or arrest the delay to the schedule.
5. Add to its equipment and materials or construction forces, as well as increase the working hours, if operations for critical, less critical or non-critical Activities fall behind the Contractor's Baseline Schedule at any time during the construction period.

H. The City may, at any time during the Project and at no additional cost to the City, require the Contractor to develop a more detailed schedule/ Fragnet than depicted in the Baseline Schedule to provide a clearer understanding of the effort needed to complete an Activity or group of Activities.

I. If the City determines that either the Critical Path is in the negative by four (4) weeks, or that the Project's date for completion may be affected, the Contractor may be required, at no additional cost to the City, to prepare a Recovery Schedule. Such Recovery Schedule is subject to review and acceptance by the City. The Recovery Schedule must propose alternative methods, overtime, and other means available to the Contractor to recover the delays incurred to date.

J. The Contractor must submit an "As-Built Schedule", as the last schedule update showing all Activities, with the exception of punch list and closeout tasks, at Substantial Completion. This schedule must reflect the exact manner in which the Project was actually constructed.

1.14 TIME IMPACT ANALYSIS:

A. In addition to the requirements of the Standard Construction Contract Article 11, the Contractor must submit a Time Impact Analysis to the Commissioner with all requests for time extension.

B. The Time Impact Analysis must include a written narrative and supporting impact schedule Fragnet detailing the Project delays resulting from the alleged delay. The impact schedule Fragnet, separate and distinct from the Progress Schedule update, must demonstrate that the changes or anticipated delays affect Activities of the current accepted Progress Schedule. The impact schedule will be incorporated into the Progress Schedule only after it is accepted by the Commissioner 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
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11. Project Schedule Updating
12. Time Impact Analysis

1.3 METHODS:

A. The Contractor must comply with Project schedule development and updating requirements as specified herein.

1. The Contractor must employ or retain the services of a Construction Scheduler with verifiable construction scheduling experience, subject to review and acceptance by the City. Upon request, the Contractor must provide the City with qualifications and experience of the proposed scheduling staff member(s).

2. The Contractor must prepare, update, and maintain a detailed Project Schedule using a version of scheduling software that is compatible with the City's Oracle Primavera P6 Enterprise Project Portfolio Management (EPPM). All schedule submittals must be developed using Oracle's Primavera P6 EPPM software. Schedules must be developed using accepted CPM techniques using the Precedence Diagramming Method (PDM). The Project Schedule must be developed following Defense Contract Management Agency (DCMA) and American Association of Cost Engineering International (AACE International) guidance. The Contractor will be required to use

the Contractor's own P6 license (whether single-user or Enterprise license), unless otherwise directed by the Commissioner. If directed by the Commissioner prior to the Notice to Proceed (NTP), the Contractor must use the Department's P6 Enterprise license and develop the Progress Schedule within the Department's Enterprise environment.

3. Once the Baseline Schedule is accepted by the City, progress updates to the Project Schedule must be submitted monthly, unless otherwise directed by the City, until Substantial Completion. The Data Date for the schedule updates must use the last Friday of the month, or as directed by the City.

4. The Contractor will be responsible for providing the monthly schedule updates once the Baseline Schedule is approved. Each monthly schedule update must be accompanied with a schedule narrative that explains the following:

   a) The progress of work during that particular period of performance;
   b) Any changes in schedule Logic;
   c) The physical conditions that were used to update every Activities Percent Complete;
   d) Any change in actual Start and Finish Dates;
   e) Any Duration changes;
   f) Any added and deleted Activities; and,
   g) Any added Extra Work (e.g., change orders).

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	**Definition**
Activity	A representation of a discrete portion of the overall scope of Work or an event through Duration and description in a CPM schedule.
Baseline Schedule	The planned and detailed CPM schedule of Activities, including all Logic, Durations, Resource and Cost Loading, and showing the entire scope of Work. The Baseline Schedule must be accepted by the City.
Critical Path	The longest sequence of Activities in a network which establishes the minimum length of time for accomplishment of the end event of the Project.
Critical Path Method (CPM)	A management technique used to plan and control a Project which combines all relevant information into a single plan defining the sequence and Duration of operations and depicting the interrelationship of the Work elements required to complete the Project.
Current Schedule	The most recently updated schedule that captures progress to date and forecasts the dates for each Activity.
Data Date	The date used as a starting point for scheduling calculations. The Data Date is changed to the current end of period date when a schedule is updated for progress.
Duration	The amount of time, in workdays, an Activity will take to perform.

Term	Definition
Finish Date	The earliest estimated date an Activity is calculated to be complete, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Free Float	The calculated amount of time that the estimated start or finish of an Activity can be delayed without impacting the start or finish of other downstream Activities logically connected in a progressive relationship. (See Finish Date and Late Finish).
Fragnet	Fragmentary network: a portion of a schedule detailing impacts of an event on specific Activities in the broader schedule.
Inclement Weather	Any weather condition, the duration of which varies in excess of the 3-year average published by the National Oceanic and Atmospheric Administration (NOAA) information for the local area.
Integrated Project Schedule	The Commissioner's overall schedule covering design, procurement, and construction. The Commissioner will use the Contractor's Project Schedule to update the Integrated Project Schedule.
Late Finish	An estimate of the latest plausible date an Activity's completion can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Late Start	An estimate of the latest plausible date an Activity's start can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Logic	A direct progressive relationship between Activities where one Activity's performance restricts the performance of another Activity.
Milestone	A key or critical point in time for reference or measurement.
Network Diagram	A graphic diagram of a network schedule, showing Activities and Activity relationships.
Original Duration	The estimated amount of time, in Work Days, an Activity is expected to take to complete at the beginning of a Project as anticipated by the Contractor based on its planned means and methods at time of bid and documented in the Baseline Schedule.
Percent Complete	The percentage of the scope of Work represented by an Activity completed as of the Data Date calculated as physical percent complete for payment purposes.
Project Schedule	The Contractor's schedule used to manage the orderly and expeditious completion of the Work. The Project Schedule is initially the accepted Baseline Schedule, and is updated throughout the Project.

Term	Definition
Remaining Duration	The amount of time, in Work Days, the remaining scope of Work represented by an Activity is expected to take to complete, measured from the current Data Date.
Resource and Cost Loading	Values assigned for estimated dollars, manpower, equipment and/or materials necessary to complete the scope of Work represented by a specific Activity.
Recovery Schedule	A Recovery Schedule outlining and incorporating extraordinary efforts required to recover lost time with the aim of achieving completion of the Project within the stipulated contract Duration, plus authorized time extensions. In such case, special attention must be given to minimize delays as much as possible and must establish the nature of efforts; for instance, resources and equipment required, extended hours of work, weekend work, accelerated fabrication, required action(s) or effort(s) by the Contractor, its subcontractors, consultants, clients, end users and/or other concerned parties to recover the schedule.
Revised and/or Updated Schedule	A Baseline Schedule, Project Schedule, or Recovery Schedule for the Project that shows the actual Duration of all the completed Activities, including Duration of and the reasons for delays, if any have occurred, AND revisions to all remaining Activities of the Contractor and its subcontractors, including changes, if any, to logical ties, interrelations and the sequence of each of the outlined Activities. Any such revisions should be shown on the row just below the approved schedule of the respective Activity so that revisions can be compared. The Revised and/or updated Schedule must be reviewed and approved by the City.
Start Date	The earliest estimated date an Activity is calculated to begin, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Time Impact Analysis	A forward looking (prospective) schedule analysis used to forecast the impact to the Critical Path and to Milestone Finish Dates caused by a single event or series of events. Time Impact Analysis is not a retrospective (forensic) schedule analysis or a what-if schedule analysis of a potential event.
Total Float	The amount of time the start or finish of an Activity can be delayed without affecting the Project completion date.
Work Breakdown Structure (WBS)	WBS is a deliverable-oriented decomposition of a Project into smaller components. A WBS provides the necessary framework for detailed cost estimating and control along with providing guidance for schedule development and control.
Work Days (WD)	Work Days are every consecutive day on the calendar, excluding weekends (Saturday and Sunday) and holidays.

1.5 PRELIMINARY, BASELINE, AND PROJECT SCHEDULE PREPARATION TIMELINE:

A. Upon receipt of the NTP, the Contractor must promptly prepare a preliminary Project Schedule and subsequently a Baseline Schedule and must submit for the City's acceptance as follows:

1. Submit the Contractor's CPM Scheduler's qualifications to the City for approval within seven (7) Days after NTP. The City will respond to the submittal within seven (7) Days of the submittal receipt.
2. The preliminary Project Schedule must be submitted no later than twenty-one (21) Days after NTP.
3. The initial submittal of the Baseline Schedule must be provided to the City for review no later than forty-five (45) Days after NTP.
4. The Contractor must incorporate all corrections and revisions required by the City and provide an updated version of the Baseline Schedule for review and acceptance no later than seventy-five (75) Days after NTP to ensure that the Baseline Schedule is accepted no later than ninety (90) Days after the NTP. The ninety (90) Days must include fourteen (14) Days review time by the City for each submittal of the Baseline Schedule.
5. Once accepted, the Baseline Schedule will be the basis of Project Schedule updates.

B. Remedies

1. Preliminary Project Schedule: The City will take a credit of three thousand dollars ($3,000) if the preliminary Project Schedule is not submitted within twenty-one (21) Days of the NTP.
2. Acceptable Baseline Schedule: The City will take a credit of five thousand dollars ($5,000) if an acceptable Baseline Schedule is not submitted within ninety (90) Days of the NTP.
3. Monthly Progress Schedule updates: The City will take a credit of two thousand dollars ($2,000) for each schedule update not submitted within the period it was due.
4. Scheduling Firm Services: If an acceptable Baseline Schedule is not provided by the Contractor within ninety (90) Days of the NTP or three (3) updates are not provided by the Contractor during the period they are due, the City may engage the services of a scheduling firm to develop a Project schedule or update an existing schedule. The total cost of such services will be deducted from the monies due to the Contractor.
    a. Any schedules and updates developed by such scheduling firm are for the City's sole use and do not, in any way, represent an acceptance of responsibility by the City to schedule the Work or relieve the Contractor of the obligation to complete the Work within the Durations specified by the Contract.
5. The City will only accept the submitted information after all corrections have been made and all issues have been resolved. The City may find the Contractor in default if items required by this Section are incomplete.

1.6 PRELIMINARY PROJECT SCHEDULE DEVELOPMENT:

A. The preliminary Project Schedule must be a detailed plan (division level per Construction Specifications Institute (CSI) MasterFormat) of all operations, including submittals, permitting, testing, and construction Activities, for either the first ninety (90) Days after NTP or to the point where the Contractor plans to mobilize on site (whichever is greater). This submittal will also depict a summary level (section level per CSI MasterFormat) schedule of the major Activities for the remainder of the Work.

B. The preliminary Project Schedule will be reviewed by the City and returned with comments, as necessary, within fourteen (14) Days of submittal receipt. Information from the preliminary Project Schedule will be the general foundation for development of the Baseline Schedule.

1.7 PROJECT SCHEDULE:

A. The Baseline Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

B. After the Baseline Schedule is approved, the Project Schedule must be the Contractor's working schedule and must be used to plan, organize, execute, and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor's execution plan to complete all of the Work.

C. The Project Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

D. The Project Schedule must be the Contractor's working schedule used to plan, organize, execute, and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor's execution plan to complete all remaining Work.

E. All delay claims must be based on the current approved updates of the Project Schedule.

F. The Contractor must confirm in writing that all subcontractors performing any portion of the Work are in agreement with the accepted Baseline Schedule and the monthly updates.

G. The amount of detail represented in the Baseline and Project Schedule and supporting documents submitted must, at a minimum, include the following items :

1. Contract Milestones must be identified and included in the Baseline and Project Schedule.
2. All submittal, owner review & approval, purchase, manufacture, and delivery Activities for all major materials and equipment.
3. Deliveries of owner-furnished equipment and/or materials.
4. Preparation, submittal, and approval of drawings, material samples, and safety plans.
5. Preparation, submittal, review, and approval of permits required by all regulatory agencies and other third parties.
6. Performance of tests, submission of test reports, and approval of test results.
7. Commissioning Activities for all commissioned systems and equipment is to be clearly delineated and scheduled such that they will be completed prior to Substantial Completion. Such Activities must include, at a minimum, Pre-Functional testing and check sheets; Testing, Adjusting, and Balancing (TAB) verification; Functional Testing, including testing of all controls; and Owner's demonstration and orientation.
8. Completion dates of all items required for phased completion (if applicable).
9. Completion dates of all items required for Substantial Completion.
10. Completion dates of all items required to obtain a Temporary Certificate of Occupancy (TCO) and Certificate of Occupancy (CO).
11. Completion dates for close-out of regulatory and punch list items prior to Final Acceptance and transfer of the Project.
12. Any additional detail requested by the Commissioner.

H. Activities identified in the Baseline and Project Schedule must have the Duration in units of whole Work Days. Construction Activity Durations must not exceed twenty (20) work days unless specifically approved by the City. This is to ensure that Activities are not generalized and that each Activity and sub-Activity are defined as narrowly as reasonable to facilitate schedule tracking. Durations for non-construction Activities such as procurement of materials, delivery of equipment, concrete curing, etc., may exceed twenty (20) work days without prior approval; however, these are still subject to review by the City. Durations must be based on the available resources required for performing each Activity and must be the result of definitive labor hours using established production rates, and with consideration of on-site working conditions. If requested by the City, the Contractor must justify the reasonableness of a planned Duration.

I. Activity descriptions must use plain language that clearly and uniquely define each Activity. Each description must include a verb or work function (e.g. submit, form, pour etc.) an object (e.g. slab, foundation, etc.) and, for any construction Activities, a specific location. The Work related to each Activity must be limited to one responsibility and one trade.

J. Activity relationships must be assigned to clearly establish predecessor and successor relationships to each Activity. Open-ended Activities are not permitted with the exception of the first and last Activities in the network, the first Activity being NTP and the last being Final Acceptance. The use of relationship lag times is discouraged and only permitted with prior approval by the City. The use of negative lag is never permitted.

K. Activity constraint dates are only to be used to reflect contractual constraints unless specifically authorized by the City.

L. Float or slack in any schedule must not be for the exclusive use or benefit of either the City or the Contractor, but must be available for use by both the City and the Contractor.

M. Each resubmittal after the Project Schedule is delivered for acceptance must comply with all requirements of this section. Review and response by the City will be given within fourteen (14) Days after resubmission. The Contractor's receipt of the comments within the time specified must not in any way affect the Contractor's responsibility to complete the Project within the time fixed in Schedule A.

N. Failure by the City to return comments or indicate acceptance status will in no way relieve the Contractor's obligation to submit monthly schedule updates.

O. At the request of the City, the Contractor must be required to make a presentation to explain or clarify the intended logical sequence of construction Activities depicted in the detailed Project Schedule. The Contractor and designated scheduler must discuss anticipated challenges and outline construction methodology and flow of work to show how and when major Milestones will be achieved. In addition, the Contractor may, at no cost to the City, be required to participate in additional Project meetings necessary to obtain acceptance of the above noted submittals.

1.8 ACTIVITY AND CALENDAR CODING STRUCTURE:

A. The Baseline and Project Schedules must contain a sufficient number of Activities to represent adequate planning and execution of the Work so that it shows an accurate flow of work and demonstrates an understanding of the Project by the Contractor.

B. Activity ID and Calendar Coding

1. The Contractor's proposed Activity and calendar coding and must be submitted with the preliminary Project Schedule. A meeting may be requested by the City to discuss the scheme and other schedule information prior to the submittal of the Project Schedule. The accepted coding scheme and WBS Structure must be incorporated into the Project Schedule.

C. Activity ID Coding

1. All Activities/Resources/Calendars (Baseline and Project Schedules) must be coded inside the P6 Project Environment / Project Level (NOT the Global Environment/Enterprise Level) to facilitate selection, sorting and preparation of reports.

2. Activity coding must consist of the Project ID followed by a dash, followed by Activity coding (PROJECT ID-ACTIVITY CODE). Activity codes must be created at the Project level and must utilize the coding scheme outlined in the table below:

Activity Code	Meaning
RESP	Responsibility: Identify the party (e.g. Contractor, subcontractor, City, etc.) responsible for the Activity.
PHAS	Phase: Breakdown of Activities in Milestones, pre-construction, procurement, construction and close-out Activities.
LOCN	Location: Breakdown by floor or elevation.
AREA	Area: Breakdown by room, area, block or wing. May be used as a subdivision of PHAS to include Milestones, permits, subcontractor approvals, submittals, fabrication and delivery, and subdivision of the Site and buildings into Logical modules, such as by blocks, wings, etc.
TRAD	Trade: Breakdown by CSI Code or section number in the Specifications.

a. Description of schedule Activities must include terminology that represents the scope of work associated with that particular Activity. Terminology used to describe similar actions must be consistent across all segments of work.

b. Naming convention for schedule Activities must be descriptive and indicate the associated work covered by the Activity. Activities must use a verb, noun, and location of the work in the Activity name.

3. Project Calendar Coding

a. All calendars created and assigned to Activities must be Project-level calendars. The Calendar Name must consist of the Project ID number followed by a dash, followed by a descriptive Calendar Name (PROJECT ID-CALENDAR NAME).

1.9 WORK BREAKDOWN STRUCTURE:

A. A multi-level hierarchal WBS must be incorporated in all P6 schedules. An initial, proposed WBS must be submitted with the preliminary Project Schedule. The levels (nodes) must include, but not be limited to:

1. LEVEL 01 – The Project Level.
2. LEVEL 02 – Contains a minimum of four (4) nodes; Pre-Construction, Procurement, Construction or Phase of Construction, and Closeout.
3. LEVEL 03 – Decomposition of each of the four (4) nodes in Level 02 into its constituent parts. This level must target specific, tangible, deliverable scopes of the Project Work.

B. The Contractor's proposed WBS must be submitted with the preliminary Project Schedule. The accepted WBS must be incorporated into the Baseline and Project Schedule.

1.10 MAJOR MILESTONES:

A. The schedule must include both contractual and non-contractual Milestones that are provided by the City. These Milestones must be properly associated with the related Work packages and maintained to represent the progress of the Project.

1.11 SHORT (THREE-WEEK) INTERVAL / TWO-WEEK LOOK-AHEAD:

A. On a bi-weekly basis, the Contractor must provide a three (3) week short interval schedule in a format satisfactory to the City. The purpose of this schedule is to report the actual progress of the past week against the previous short interval look-ahead Activities and add any additional Activities planned for the next two (2) weeks. Electronic files and hard copies must be provided to the City on the first day of each work week with the prior week's actual progress included.

B. Each Task listed on the short interval schedule must be representative of the most current Project Schedule Update and include a reference to an Activity shown on the current update.

C. The short interval schedule must list all required DDC coordinated activities, including special inspections.

1.12 SUBMITTALS:

A. General

1. Development of the Baseline Schedule and updating of the Project Schedule must follow the DCMA and AACE International guidelines.

2. Each electronic submission of the Project Schedule must be assigned a unique file name consisting of the Project ID (as noted on the NTP followed by a dash followed by a unique file name clearly marked (i.e. ProjID- B000 = B/L rev0, ProjID-B001 = B/L rev01 etc.) to indicate the specific submission. Similarly, update submittals must be named ProjID-Uxxx where xxx is a sequential number, starting with 001, indicating the revision or issue number.

3. The Contractor must provide all submittals in electronic format and two hard copies.

B. Preliminary Project Schedule

1. For acceptance of the preliminary Project Schedule the Contractor must submit the following:

a. Two (2) 11" x 17" hard copies of the proposed preliminary Project schedule, as well as the native electronic schedule data file, in .XER file format, per the direction of the City.

b. A Schedule Narrative Report detailing the Contractor's initial plan for executing the Contract work within the allotted Contract Duration, and include the following explanation of their provided preliminary schedule:

i. The proposed WBS;
ii. All proposed Project Calendars;
iii. All proposed Activity Codes, clearly defined;
iv. The proposed Activity ID format; and
v. Schedule basis narrative, which must memorialize assumptions made in the development of the schedule.

C. Baseline Schedule

1. The City will return comments within ten (10) Work Days after receipt of the initial Project Schedule Submission. If any of the required submissions are returned to the Contractor for

corrections or revisions, they must be resubmitted within five (5) Work Days from receipt of comments. Each resubmittal must comply with the requirements enumerated above. Review and response by the City will be given within ten (10) Work Days after resubmission.

2. At the request of the City, the Contractor will be required to participate in Project meetings necessary to obtain an acceptance of the above noted submittals.

3. Baseline Schedule submittal must contain a Narrative Report. It must include the following, or as directed by the City:

   a. A description of the Project scope and how the Work is represented in the schedule Activities;

   b. A description of the overall sequence of major components of Work;

   c. Planned work week for each definable feature of work;

   d. Description of the Critical Path and near Critical Paths;

   e. Basis of Durations, described in terms of quantity and production rate;

   f. How weather will be accommodated in the schedule, including a description of the weather calendar and the Activities it is applied to, and the NOAA Inclement Weather data that defined the number of non-Work Days;

   g. How regulatory, operational or third-party constraints are accommodated in the schedule;

   h. Description of key Project coordination points or events;

   i. Discussion of long lead items and basis of time frames for submittals;

   j. Description of anticipated means and methods for large quantity production Activities; and,

   k. Potential opportunities and risks, including quantification of the schedule reduction or expansion.

D. Project Schedule Updates

1. Every schedule submittal must be provided with a corresponding narrative. These schedule submittals and narratives are to be submitted in hard copy, as well as in the native electronic format, as attachments to emails or other media accepted by the City. When opened, the electronic format must provide flawless restoration of the native files (P6 (.XER) for Primavera schedule files and MS Word and/or Adobe Acrobat for Narrative and supporting document submittals).

2. For each submittal of the updated Project Schedule, the following layouts, reports, and graphics are required in the specified formats, unless otherwise directed by the City:

   a. The Contractor must furnish two (2) 11” x 17” hard copies of the complete progress schedule with each initial schedule update and final update incorporating comments furnished by the City. Additionally, the Contractor must provide the native electronic schedule data file, in .XER file format, with the initial and final schedule update submission.

   b. An Activity bar chart layout grouped by Activity Code and then sorted by Start Date, Finish Date, and then Total Float.

   c. Each Activity line must display the Activity ID (Act ID), Description (Name), Original Duration (OD), Remaining Duration (RD), Start Date (ES), Finish Date (EF), and Total

Float (TF), Baseline Original Duration (BL OD) Baseline Start (BL Start), Baseline Finish (BL Fin), Baseline Total Float (BL TF).

d. An Activities progress bar must show both current progress update ES and EF, and baseline ES and EF. The top line of the bar chart area must contain the updated ES and EF; the second line below must depict the accepted baseline ES and EF dates.

3. The City may request additional standard P6 reports from time to time at no additional cost.

4. The Monthly Update submittal must contain a Narrative Report. It must include the following, or as directed by the City:

a. Any changes to the schedule basis narrative
b. A discussion of progress through the update period and status of the Project with respect to completion of the schedule. The progress reporting must detail work Activities that relate to the Project's Critical Path and if these Activities are progressing as planned.
c. A discussion of changes, delays or other circumstances affecting Progress including identified risks and opportunities and the Contractor's strategy.
d. A listing and brief explanation of modifications to the previously submitted network including Logic changes and Activity additions, deletions or modifications.
e. An update on the status of long lead items and whether the item is on the Critical Path.
f. The Contractor must report on all out of sequence Activities, the cause of this deviation to plan, and the proposed resolution of this issue.
g. The Contractor must include an explanation of assumptions and exclusions made in developing the schedule update and narrative.
h. A table of permits, showing status and any changes in status.

5. The Contractor must provide a copy of the computer file(s) in electronic format or other media accepted by the City. When opened, the electronic format must provide flawless restoration of the native files and an electronic copy of the Narrative Report.

1.13 PROJECT SCHEDULE UPDATING:

A. The initial updating must take place immediately after the City accepts the Contractor's Baseline Schedule. The Data Date for the first update must not exceed seven (7) Days from the date of receipt of the accepted Baseline Schedule, or as directed by the City.

B. Subsequent updates of the Project Schedule must be submitted monthly until Substantial Completion. The schedule data date must be the last Work Day of the period unless otherwise directed by the City. Updates must be provided to the City no later than seven (7) Days after the 'schedule Data Date'.

C. Updates must reflect actual or reasonably anticipated progress as of the last Work Day of the period.

D. The City may request meetings with the Contractor to review the Project Schedule and Narrative and jointly verify Project health and information.

E. In addition, the City may request meetings with the Contractor's scheduling representative to:

1. Resolve out-of-sequence Logic;

2. Should out-of-sequence progress occur where Activities have reported progress without predecessor Activities being completed, the Contractor must obtain the City's approval in a Proposed Schedule before revising the Logic ties to reflect the way the Work is actually being performed. Use of progress override by default mechanisms that may be included in CPM scheduling software systems will not be allowed except on a case-by-case basis with the

approval of the City. A written explanation for each instance must be included in the monthly submittal narrative.

3. Assess the impact, if any, of any pending change orders.

4. Incorporate accepted time extensions.

5. Review revised Logic (as-built and projected) and changes in Activity Duration, cost, and labor hours assigned.

F. Contractor's failure to provide required scheduling information within the required timeframe or to adhere to the currently accepted schedule may result in rejection of all or a portion of the progress payment until such time as the required schedule information is submitted and accepted by the City.

G. Delays to the Critical Path – Whenever it becomes apparent from the monthly CPM schedule update that delays to the Critical Path have occurred due to action or inaction of the Contractor and, as a result, the date for Substantial Completion will not be met, the Contractor must promptly take some or all of the following actions at no additional cost to the City, unless otherwise directed by the City:

1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of Work.

2. Increase the number of working hours per shift, shifts per day, or Work Days per week; the amount of construction equipment; the forms for concrete work; etc., or any combination of the foregoing to substantially eliminate the backlog of Work.

3. Reschedule Activities to achieve maximum practical concurrence of accomplishment of Activities and comply with the revised schedule.

4. Submit to the City for review a written statement of the steps the Contractor intends to take to remove or arrest the delay to the schedule.

5. Add to its equipment and materials or construction forces, as well as increase the working hours, if operations for critical, less critical or non-critical Activities fall behind the Contractor's Baseline Schedule at any time during the construction period.

H. The City may, at any time during the Project and at no additional cost to the City, require the Contractor to develop a more detailed schedule/ Fragnet than depicted in the Baseline Schedule to provide a clearer understanding of the effort needed to complete an Activity or group of Activities.

I. If the City determines that either the Critical Path is in the negative by four (4) weeks, or that the Project's date for completion may be affected, the Contractor may be required, at no additional cost to the City, to prepare a Recovery Schedule. Such Recovery Schedule is subject to review and acceptance by the City.

1. The recovery schedule must propose alternative methods, overtime, and other means available to the Contractor to recover the delays incurred to date.

2. The Recovery Schedule must be resource-loaded with manpower and equipment required to bring the date for Substantial Completion back into compliance.

J. The Contractor must submit an "As-Built Schedule", as the last schedule update showing all Activities, with the exception of punch list and closeout tasks, at Substantial Completion. This schedule must reflect the exact manner in which the Project was actually constructed.

1.14 TIME IMPACT ANALYSIS:

A. In addition to the requirements of the Standard Construction Contract Article 11, the Contractor must submit a Time Impact Analysis to the Engineer with all requests for time extension.

B. The Time Impact Analysis must include a written narrative and supporting impact schedule Fragnet detailing the Project delays resulting from the alleged delay. The impact schedule Fragnet, separate and distinct from the Progress Schedule update, must demonstrate that the changes or anticipated delays affect Activities of the current accepted Progress Schedule. The impact schedule will be incorporated into the Progress Schedule only after it is accepted by the Commissioner and a time extension is approved. The Fragnet submitted as part of the Time Impact Analysis must illustrate the impact of these changes or delays on the date for Substantial Completion.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 32 16.20

SECTION 01 32 16.30
PROJECT SCHEDULES (METHOD C)

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 16.30

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:

1. Methods
2. Definitions
3. Preliminary, Baseline, and Project Schedule Preparation Timeline
4. Preliminary Project Schedule Development
5. Project Schedule
6. Activity and Calendar Coding Structure
7. Work Breakdown Structure (WBS)
8. Major Milestones
9. Short (Three-Week) Interval/Two-Week Look-Ahead
10. Submittals
11. Project Schedule Updating
12. Time Impact Analysis

1.3 METHODS:

A. The Contractor must comply with Project schedule development and updating requirements as specified herein.

1. The Contractor must employ or retain the services of a Construction Scheduler with verifiable construction scheduling experience, subject to review and acceptance by the City. Upon request, the Contractor must provide the City with qualifications and experience of the proposed scheduling staff member(s).

2. The Contractor must prepare, update, and maintain a detailed Project Schedule using a version of scheduling software that is compatible with the City's Oracle Primavera P6 Enterprise Project Portfolio Management (EPPM). All schedule submittals must be developed using Oracle's Primavera P6 EPPM software. Schedules must be developed using accepted CPM techniques using the Precedence Diagramming Method (PDM). The Project Schedule must be developed following Defense Contract Management Agency (DCMA), and American Association of Cost Engineering International (AACE International) guidance. The Contractor will be required to use the Contractor's own P6 license (whether single-user or Enterprise

license), unless otherwise directed by the Commissioner. If directed by the Commissioner prior to the Notice to Proceed (NTP), the Contractor must use the Department's P6 Enterprise license and develop the Progress Schedule within the Department's Enterprise environment.

3. Once the Baseline Schedule is accepted by the City, progress updates to the Project Schedule must be submitted monthly, unless otherwise directed by the City, until Substantial Completion. The Data Date for the schedule updates must use the last Friday of the month, or as directed by the City.

4. The Contractor must be responsible for providing the monthly schedule updates once the Baseline Schedule is approved. Each monthly schedule update must be accompanied with a schedule narrative that explains the following:

   a) The progress of work during that particular period of performance;
   b) Any changes in schedule Logic;
   c) The physical conditions that were used to update every Activities Percent Complete;
   d) Any change in actual Start and Finish Dates;
   e) Any Duration changes;
   f) Any added and deleted Activities; and
   g) Any added Extra Work (e.g., change orders).

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	**Definition**
Activity	A representation of a discrete portion of the overall scope of Work or an event through Duration and description in a CPM schedule.
Baseline Schedule	The planned and detailed CPM schedule of Activities, including all Logic, Durations, Resource and Cost Loading, and showing the entire scope of Work. The Baseline Schedule must be accepted by the City.
Critical Path	The longest sequence of Activities in a network which establishes the minimum length of time for accomplishment of the end event of the Project.
Critical Path Method (CPM)	A management technique used to plan and control a project which combines all relevant information into a single plan defining the sequence and Duration of operations and depicting the interrelationship of the Work elements required to complete the Project.
Current Schedule	The most recently updated schedule that captures progress to date and forecasts the dates for each Activity.
Data Date	The date used as a starting point for scheduling calculations. The Data Date is changed to the current end of period date when a schedule is updated for progress.

Term	Definition
Duration	The amount of time, in workdays, an Activity will take to perform.
Finish Date	The earliest estimated date an Activity is calculated to be complete, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Free Float	The calculated amount of time that the estimated start or finish of an Activity can be delayed without impacting the start or finish of other downstream Activities logically connected in a progressive relationship. (See Finish Date and Late Finish).
Fragnet	Fragmentary network: a portion of a schedule detailing impacts of an event on specific Activities in the broader schedule.
Inclement Weather	Any weather condition, the duration of which varies in excess of the 3-year average published by the National Oceanic and Atmospheric Administration (NOAA) information for the local area.
Integrated Project Schedule	The Commissioner's overall schedule covering design, procurement, and construction. The Commissioner will use the Contractor's Project Schedule to update the Integrated Project Schedule.
Late Finish	An estimate of the latest plausible date an Activity's completion can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Late Start	An estimate of the latest plausible date an Activity's start can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Logic	A direct progressive relationship between Activities where one Activity's performance restricts the performance of another Activity.
Milestone	A key or critical point in time for reference or measurement.
Network Diagram	A graphic diagram of a network schedule, showing Activities and Activity relationships.
Original Duration	The estimated amount of time, in Work Days, an Activity is expected to take to complete at the beginning of a project as anticipated by the Contractor based on its planned means and methods at time of bid and documented in the Baseline Schedule.
Percent Complete	The percentage of the scope of Work represented by an Activity completed as of the Data Date calculated as physical percent complete for payment purposes.

Term	Definition
Project Schedule	The Contractor's schedule used to manage the orderly and expeditious completion of the Work. The Project Schedule is initially the accepted Baseline Schedule, and is updated throughout the Project.
Remaining Duration	The amount of time, in Work Days, the remaining scope of Work represented by an Activity is expected to take to complete, measured from the current Data Date.
Resource and Cost Loading	Values assigned for estimated dollars, manpower, equipment and/or materials necessary to complete the scope of Work represented by a specific Activity.
Recovery Schedule	A Recovery Schedule outlining and incorporating extraordinary efforts required to recover lost time with the aim of achieving completion of the Project within the stipulated contract Duration, plus authorized time extensions. In such case, special attention must be given to minimize delays and must establish the nature of efforts; for instance, resources and equipment required, extended hours of work, weekend work, accelerated fabrication, required action(s) or effort(s) by the Contractor, its Subcontractors, consultants, clients, end users and/or other concerned parties to recover the schedule.
Revised and/or Updated Schedule	A Baseline Schedule, or Progress Project Schedule, or Recovery Schedule for the Project that shows the actual Duration of all the completed Activities, including Duration of and the reasons for delays, if any have occurred, AND revisions to all remaining Activities of the Contractor and its Subcontractors, including changes, if any, to logical ties, interrelations and the sequence of each of the outlined Activities. Any such revisions should be shown on the row just below the approved schedule of the respective Activity so that revisions can be compared. The Revised and/or updated Schedule must be reviewed and approved by the City.
Start Date	The earliest estimated date an Activity is calculated to begin, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Time Impact Analysis	A forward looking (prospective) schedule analysis used to forecast the impact to the Critical Path and to Milestone Finish Dates caused by a single event or series of events. Time Impact Analysis is not a retrospective (forensic) schedule analysis or a what-if schedule analysis of a potential event.
Total Float	The amount of time the start or finish of an Activity can be delayed without affecting the Project completion date.

Term	Definition
Work Breakdown Structure (WBS)	WBS is a deliverable-oriented decomposition of a Project into smaller components. A WBS provides the necessary framework for detailed cost estimating and control along with providing guidance for schedule development and control.
Work Days (WD)	Work Days are every consecutive day on the calendar, excluding weekends (Saturday and Sunday) and holidays.

1.5 PRELIMINARY, BASELINE, AND PROJECT SCHEDULE PREPARATION TIMELINE:

A. Upon receipt of the NTP, the Contractor must promptly prepare a preliminary Project Schedule and subsequently a Baseline Schedule and must submit for the City's acceptance as follows:

1. Submit the Contractor's CPM Scheduler's qualifications to the City for approval within seven (7) Days after NTP. The City will respond to the submittal within seven (7) Days of the submittal receipt.
2. The preliminary Project Schedule must be submitted no later than twenty-one (21) Days after NTP.
3. The initial submittal of the Baseline Schedule must be provided to the City for review no later than forty-five (45) Days after NTP.
4. The Contractor must incorporate all corrections and revisions required by the City and provide an updated version of the Baseline Schedule for review and acceptance no later than seventy-five (75) Days after NTP to ensure that the Baseline Schedule is accepted no later than ninety (90) Days after the NTP. The ninety (90) Days must include fourteen (14) Days review time by the City for each submittal of the Baseline Schedule.
5. Once accepted, the Baseline Schedule will be the basis of Project Schedule updates.

B. Remedies

1. Preliminary Project Schedule: The City will take a credit of three thousand dollars ($3,000) if the preliminary Project Schedule is not submitted within twenty-one (21) Days of the NTP.
2. Acceptable Baseline Schedule: The City will take a credit of five thousand dollars ($5,000) if an acceptable Baseline Schedule is not submitted within ninety (90) Days of the NTP.
3. Monthly Progress Schedule updates: The City will take a credit of two thousand dollars ($2,000) for each schedule update not submitted within the period it was due.
4. Scheduling Firm Services: If an acceptable Baseline Schedule is not provided by the Contractor within ninety (90) Days of the NTP or three (3) updates are not provided by the Contractor during the period they are due, the City may engage the services of a scheduling firm to develop a Project schedule or update an existing schedule. The total costs of such services will be deducted from the monies due to the Contractor.
5. Any schedules and updates developed by such scheduling firm are for the City's sole use and do not, in any way, represent an acceptance of responsibility by the City to schedule the Work or relieve the Contractor of the obligation to complete the Work within the Durations specified by the Contract.

6. The City will only accept the submitted information after all corrections have been made and all issues have been resolved. The City may find the Contractor in default if items required by this Section are incomplete.

1.6 PRELIMINARY PROJECT SCHEDULE DEVELOPMENT:

A. The preliminary Project Schedule must be a detailed plan (division level per Construction Specifications Institute (CIS) MasterFormat) of all operations, including submittals, permitting, testing, and construction Activities, for either the first ninety (90) Days after NTP or to the point where the Contractor plans to mobilize on site (whichever is greater). This submittal will also depict a summary level (section level per CSI MasterFormat) schedule of the major Activities for the remainder of the Work.

B. The preliminary Project Schedule will be reviewed by the City and returned with comments, as necessary, within fourteen (14) Days of submittal receipt. Information from the preliminary Project Schedule will be the general foundation for development of the Baseline Schedule.

1.7 PROJECT SCHEDULE:

A. The Baseline Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

B. After the Baseline Schedule is approved, the Project Schedule must be the Contractor's working schedule and must be used to plan, organize, execute and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor’s execution plan to complete the Work.

C. The Project Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

D. The Project Schedule must be the Contractor's working schedule used to plan, organize, execute, and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor's execution plan to complete all remaining Work.

E. All delay claims must be based on the current approved updates of the Project Schedule.

F. The Contractor must confirm in writing that all Subcontractors performing any portion of the Work are in agreement with the accepted Baseline Schedule and the monthly updates.

G. The amount of detail represented in the Baseline and Project Schedule and supporting documents submitted must, at a minimum, include the following, items:

1. Contract Milestones must be identified and included in the Baseline and Project Schedule.
2. All submittal, owner review & approval, purchase, manufacture, and delivery Activities for all major materials and equipment.
3. Deliveries of owner-furnished equipment and/or materials.
4. Preparation, submittal, and approval of drawings, material samples, and safety plans.
5. Preparation, submittal, review, and approval of permits required by all regulatory agencies and other third parties.
6. Performance of tests, submission of test reports, and approval of test results.

7. Commissioning Activities for all commissioned systems and equipment is to be clearly delineated and scheduled such that they will be completed prior to Substantial Completion. Such Activities must include, at a minimum, Pre-Functional testing and check sheets; Testing, Adjusting, and Balancing (TAB) verification; Functional Testing, including testing of all controls; and Owner's demonstration and orientation.
8. Completion dates of all items required for phased completion (if applicable).
9. Completion dates of all items required for Substantial Completion.
10. Completion dates of all items required to obtain a Temporary Certificate of Occupancy (TCO) and Certificate of Occupancy (CO).
11. Completion dates for close-out of regulatory and punch list items prior to Final Acceptance and transfer of the Project.
12. Any additional detail requested by the Commissioner.

H. Activities identified in the Baseline and Project Schedule must have the Duration in units of whole Work Days. Construction Activity Durations must not exceed twenty (20) Work Days unless specifically approved by the City. This is to ensure that Activities are not generalized and that each Activity and sub-Activity are defined as narrowly as reasonable to facilitate schedule tracking. Durations for non-construction Activities such as procurement of materials, delivery of equipment, concrete curing, etc. may exceed twenty (20) Work Days without prior approval; however, these are still subject to review by the City. Durations must be based on the available resources required for performing each Activity and must be the result of definitive labor hours using established production rates, and with consideration of on-site working conditions. If requested by the City, the Contractor must justify the reasonableness of a planned Duration.

I. Activity descriptions must use plain language that clearly and uniquely defines each Activity. Each description must include a verb or work function (e.g. submit, form, pour etc.), an object (e.g. slab, foundation, etc.) and, for any construction Activities, a specific location. The Work related to each Activity must be limited to one responsibility and one trade.

J. Activity relationships must be assigned to clearly establish predecessor and successor relationships to each Activity. Open-ended Activities are not permitted with the exception of the first and last Activities in the network, the first Activity being NTP and the last being Final Acceptance. The use of relationship lag times is discouraged and only permitted with prior approval by the City. The use of negative lag is never permitted.

K. Activity constraint dates are only to be used to reflect contractual constraints unless specifically authorized by the City.

L. Float or slack, in any schedule, must not be for the exclusive use or benefit of either the City or the Contractor, but must be available for use by both the City and the Contractor.

M. Each resubmittal after the Project Schedule is delivered for acceptance must comply with all requirements of this section. Review and response by the City will be given within fourteen (14) Days after resubmission. The Contractor's receipt of the comments within the time specified must not, in any way, affect the Contractor's responsibility to complete the Project within the time fixed in Schedule A.

N. Failure by the City to return comments or indicate acceptance status will in no way relieve the Contractor's obligation to submit monthly schedule updates.

O. At the request of the City, the Contractor must be required to make a presentation to explain or clarify the intended logical sequence of construction Activities depicted in the detailed Project Schedule. The Contractor and designated scheduler must discuss anticipated challenges and outline construction methodology and flow of work to show how and when major Milestones will be achieved. In addition,

the Contractor may, at no cost to the City, be required to participate in additional Project meetings necessary to obtain acceptance of the above-noted submittals.

P. The Contractor must provide a Cost Flow Projection (CFP) summary covering from NTP to Final Acceptance. The CFP summary must match the expected billings for each period of performance.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.7.Q

Q. Schedule Cost and Resource Loading

1. At the direction of the City, and at no additional cost to the City, a Project Schedule must be cost loaded within thirty (30) Days after acceptance of the Baseline Schedule.
2. The Contractor must accurately load all Project Activities with direct field labor associated with the craft or trades required to complete that Activity. All labor must be noted in manhours required to complete the tasking. The Contractor must include in all Activities the hours required of for major pieces of equipment.
3. All Resource ID's must have a unique identifier assigned by the Contractor, and approved by the City, so the Project-specific data can be separated from other data in the system.
4. Cost loading must be accomplished by adding a single summary level cost loaded Activity in the Project Schedule. This Activity will allow initial generation and monthly updates of the planned value that is time-phased into monthly periods.
5. The intent of the cost loading is to facilitate cost forecasting, tracking, and reporting of monthly cost projection. Every month, the cost loaded summary Activity must be updated with earned value for prior months and revised monthly forecast for future periods. If there is a significant difference between the actual cumulative monthly invoice and the cumulative planned value from the cost loaded Project Schedule for any reporting month, the Contractor must provide the City with the reason for variance in the schedule narrative.

1.8 ACTIVITY AND CALENDAR CODING STRUCTURE:

A. The Baseline and Project Schedules must contain a sufficient number of Activities to represent adequate planning and execution of the Work so that it shows an accurate flow of work and demonstrates an understanding of the Project by the Contractor.

B. Activity ID and Calendar Coding

1. The Contractor's proposed Activity and calendar coding and must be submitted with the preliminary Project Schedule. A meeting may be requested by the City to discuss the scheme and other schedule information prior to the submittal of the Project Schedule. The accepted coding scheme and WBS Structure must be incorporated into the Project Schedule.

C. Activity ID Coding

1. All Activities/Resources/Calendars (Baseline and Project Schedules) must be coded inside the P6 Project Environment / Project Level (NOT the Global Environment/Enterprise Level) to facilitate selection, sorting and preparation of reports.
2. Activity coding must consist of the Project ID followed by a dash, followed by Activity coding (PROJECT ID-ACTIVITY CODE). Activity codes must be created at the Project level and must utilize the coding scheme outlined in the table below:

Activity Code	Meaning
RESP	Responsibility: Identify the party (e.g. Contractor, Subcontractor, City, etc.) responsible for the Activity.
PHAS	Phase: Breakdown of Activities in Milestones, pre-construction, procurement, construction and close-out Activities.
LOCN	Location: Breakdown by floor or elevation.
AREA	Area: Breakdown by room, area, block or wing. May be used as a subdivision of PHAS to include Milestones, permits, Subcontractor approvals, submittals, fabrication and delivery, and subdivision of the Site and buildings into Logical modules, such as by blocks, wings, etc.
TRAD	Trade: Breakdown by CSI Code or section number in the Specifications.

a. Description of schedule Activities must include terminology that represents the scope of work associated with that particular Activity. Terminology used to describe similar actions must be consistent across all segments of work.

b. Naming convention for schedule Activities must be descriptive and indicate the associated work covered by the Activity. Activities must use a verb, noun, and location of the work in the Activity name.

3. Project Calendar Coding

a. All calendars created and assigned to Activities must be Project-level calendars. The Calendar Name must consist of the Project ID number followed by a dash, followed by a descriptive Calendar Name (PROJECT ID-CALENDAR NAME).

1.9 WORK BREAKDOWN STRUCTURE:

A. A multi-level hierarchal WBS must be incorporated in all P6 schedules. An initial, proposed WBS must be submitted with the preliminary Project Schedule. The levels (nodes) must include, but not be limited to:

1. LEVEL 01 – The Project Level.
2. LEVEL 02 – Contains a minimum of four (4) nodes: Pre-Construction, Procurement, Construction or Phase of Construction, and Closeout.
3. LEVEL 03 – Decomposition of each of the four (4) nodes in Level 02 into its constituent parts. This Level must target specific, tangible, scopes of the Project Work.
4. LEVEL 04 – Decomposition of Level 03 Activities providing work package details that provide an understanding of the process to be used to execute the Project Work.

B. The Contractor's proposed WBS must be submitted with the preliminary Project Schedule. The accepted WBS must be incorporated into the Baseline and Project Schedule.

1.10 MAJOR MILESTONES:

A. The schedule must include both contractual and non-contractual Milestones that are provided by the City. These Milestones must be properly associated with the related Work and maintained to represent the progress of the Project.

1.11 SHORT (THREE-WEEK) INTERVAL / TWO-WEEK LOOK-AHEAD:

A. On a weekly basis, the Contractor must provide a three (3) week short interval schedule in a format satisfactory to the City. The purpose of this schedule is to report the actual progress of the past week against the previous short interval look-ahead Activities and add any additional Activities planned for the next two (2) weeks. Electronic and hard copies must be provided to the City on the first day of each work week with the prior week's actual progress included.

B. Each task listed on the short interval schedule must be representative of the most current Project Schedule Update and include a reference to an Activity shown on the current update.

C. The short interval schedule must list all required DDC coordinated activities, including special inspections.

1.12 SUBMITTALS:

A. General

1. Development of the Baseline Schedule and updating of the Project Schedule must follow the DCMA and AACE International guidelines.

2. Each electronic submission of the Project Schedule must be assigned a unique file name consisting of the Project ID (as noted on the NTP), followed by a dash followed by a unique file name clearly marked (i.e. ProjID- B000 = B/L rev0, ProjID-B001 = B/L rev01 etc.) to indicate the specific submission. Similarly, update submittals must be named ProjID-Uxxx where xxx is a sequential number, starting with 001, indicating the revision or issue number.

3. The Contractor must provide all submittals in electronic format and two hard copies.

B. Preliminary Project Schedule

1. For acceptance of the preliminary Project Schedule, the Contractor must submit the following:

a. Two (2) 11" x 17" hard copies of the proposed preliminary Project Schedule, as well as the native electronic schedule data file, in .XER file format, per the direction of the City.

b. A Schedule Narrative Report detailing the Contractor's initial plan for executing the Contract work within the allotted Contract Duration, and include the following explanation of their provided preliminary schedule:

i. The proposed (WBS);
ii. All proposed Project Calendars;
iii. All proposed Activity Codes, clearly defined;
iv. The proposed Activity ID format; and
v. Schedule basis narrative, which must memorialize the assumptions made in the development of the schedule.

C. Baseline Schedule

1. The City will return comments within ten (10) Work Days after receipt of the initial Project Schedule Submission. If any of the required submissions are returned to the Contractor for corrections or revisions, they must be resubmitted within five (5) Work Days from receipt of comments. Each resubmittal must comply with the requirements enumerated above. Review and response by the City will be given within ten (10) Work Days after resubmission.

2. At the request of the City, the Contractor will be required to participate in Project meetings necessary to obtain an acceptance of the above noted submittals.

3. Baseline Schedule submittal must contain a Narrative Report. It must include the following, or as directed by the City:

   a. A description of the Project scope and how the Work is represented in the schedule Activities;

   b. A description of the overall sequence of major components of Work;

   c. Planned work week for each definable feature of work.

   d. Description of the Critical Path and near Critical Paths;

   e. Basis of Durations, described in terms of quantity and production rate;

   f. How weather will be accommodated in the schedule, including a description of the weather calendar and the Activities it is applied to, and the NOAA Inclement Weather data that defined the number of non-work days;

   g. How regulatory, operational or third-party constraints are accommodated in the schedule;

   h. Description of key Project coordination points or events;

   i. Discussion of long lead items and basis of time frames for submittals;

   j. Description of anticipated means and methods for large quantity production Activities;

   k. Potential opportunities and risks, including quantification of the schedule reduction or expansion; and

   l. Assumptions/exclusions made in the schedule.

D. Project Schedule Updates

1. Every schedule submittal must be provided with a corresponding narrative. These schedule submittals and narratives must be submitted in hard copy and the native electronic format as attachments to emails or other media accepted by the City. When opened, the electronic format must provide flawless restoration of the native files (P6 (.XER) for Primavera schedule files and MS Word and/or Adobe Acrobat for narrative and supporting document submittals).

2. For each submittal of the updated Project Schedule, the following layouts, reports, and graphics are required in the specified formats, unless otherwise directed by the City:

   a. The Contractor must furnish two (2) 11” x 17” hard copies of the complete progress schedule with each initial schedule update and final update incorporating comments furnished by the City. Additionally, the Contractor must provide the native electronic schedule data file, in .XER file format with the initial and final schedule update submission.

   b. An Activity bar chart Layout grouped by Activity Code and then sorted by Start Date, Finish Date, and Total Float.

   c. Each Activity line must display the Activity ID (Act ID), Description (Name), Original Duration (OD), Remaining Duration (RD), Start Date (ES), Finish Date (EF), and Total Float (TF), Baseline Original Duration (BL OD), Baseline Start (BL Start), Baseline Finish (BL Fin), Baseline Total Float (BL TF).

   d. An Activities progress bar must show both current progress update ES and EF, and baseline ES and EF. The top line of the bar chart area must contain the updated ES and EF; the second line below must depict the accepted baseline ES and EF dates.

3. The City may request additional standard P6 reports from time to time at no additional cost.

4. The Monthly Update submittal must contain a Narrative Report. It must include the following, or as directed by the City:

   a. Any changes to the schedule basis narrative;

   b. Overall health of the Project;

   c. Actual Activity Start Dates;

   d. Actual Activity Finish Dates;

   e. The physical conditions that were used to update Activities percent complete

   f. Percent of Work reported in place;

   g. Contract and Milestone completion date status:

      i. Number of Days ahead or behind schedule; and
      ii. Days lost/gained compared with the previous update.

   h. Schedule change report organized by Milestone and area comparing the number of Activities that were planned to start and finish to the number that actually started and finished for the reporting period;

   i. Lookahead report listing each Activity in the CPM schedule that is scheduled to be performed during the next reporting period;

   j. Plans for executing scheduled Activities during the next reporting period;

   k. Analysis, organized by Milestone and area, of the Critical Path and near Critical Path(s) describing:

      i. The nature of the Critical Path/near Critical Path;
      ii. Impact on other Activities, Milestones and Finish dates; and
      iii. Identify, or update, risks and opportunities that may impact the Critical Path/near Critical Paths.

   l. List of current and anticipated delays by Milestone:

      i. Cause of the delay;
      ii. Corrective actions and schedule adjustments to correct the delay;
      iii. Impact of the delay on other Activities, Milestones and completion dates; and
      iv. Weather delays, when applicable. The Contractor must describe how the impacts of weather conditions and constraints were absorbed and accounted for in the schedule.

   m. Changes in Activity description, Logic, or Duration must be submitted as a separate Proposed Schedule and approved by the City prior to being submitted as an official update. Once allowed, said changes must be grouped and organized in the report in a manner that communicates in detail the rationale associated with each change and the impact upon construction sequence, relationships and the Critical Path. A standard Digger Report is not sufficient to meet this requirement;

   n. Added/deleted Activities and the rationale associated with each action;

   o. Pending issues and status of other items;

   p. Permits, in a tabular format, showing the status and change in status of all permits;

   q. Contract modifications;

   r. Current and potential extra Work, including change orders;

s. Status of long lead procurement items and whether the item is on the Critical Path;

t. Status of Project submittals;

u. Out of sequence report describing the necessity of each Activity relationship shown therein, as described within this Section;

v. Illogical progress/restraint reports (if any);

w. Other Project or scheduling concerns;

x. Electronic copy of the latest CPM schedule update file in Primavera (.XER) format; and

y. Primavera scheduling error report.

1.13 PROJECT SCHEDULE UPDATING:

A. The initial updating must take place immediately after the City accepts the Contractor's Baseline Schedule. The Data Date for the first update must not exceed seven (7) Days from the date of receipt of the accepted Baseline Schedule, or as directed by the City.

B. Subsequent updates to the Project Schedule must be submitted monthly until Substantial Completion is achieved. The schedule Data Date must be set to the last Work Day of the period unless otherwise directed by the City. Updates must be provided to the City no later than seven (7) Days after the 'schedule Data Date'.

C. Updates must reflect actual or reasonably anticipated progress as of the last Work Day of the period.

D. The City may request meetings with the Contractor to review the Project Schedule and narrative and jointly verify Project health and information.

E. In addition, the City may request meetings with the Contractor's scheduling representative to:

1. Resolve out-of-sequence Logic.

2. Should out-of-sequence progress occur where Activities have reported progress without predecessor Activities being completed, the Contractor must obtain the City's approval in a Proposed Schedule before revising the Logic ties to reflect the way the Work is actually being performed. Use of progress override by default mechanisms that may be included in CPM scheduling software systems will not be allowed except on a case-by-case basis with the approval of the City. A written explanation for each instance must be included in the monthly submittal narrative.

3. Assess the impact, if any, of any pending change orders.

4. Incorporate accepted time extensions.

5. Review revised Logic (as-built and projected) and changes in Duration, cost, and labor hours assigned.

F. Contractor's failure to provide required scheduling information within the required timeframe or to adhere to the currently accepted schedule may result in rejection of all or a portion of the progress payment until such time as the required schedule information is submitted and accepted by the City.

G. Delays to the Critical Path – Whenever it becomes apparent from the monthly CPM schedule update that delays to the Critical Path have occurred due to action or inaction of the Contractor, and as a result the date for Substantial Completion will not be met, the Contractor must promptly take some or all of the following actions at no additional cost to the City, unless otherwise directed by the City:

1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of Work.

2. Increase the number of working hours per shift, shifts per day, or Work Days per week; the amount of construction equipment; the forms for concrete work; etc., or any combination of the foregoing to substantially eliminate the backlog of Work.

3. Reschedule Activities to achieve maximum resource utilization across the Project and comply with the revised schedule.

4. Submit to the City a written statement of the steps the Contractor intends to take to remove or arrest the delay to the schedule. The Contractor must promptly provide the necessary level of effort to bring the Work back on schedule.

5. Add to its equipment and materials or construction forces, as well as increase the working hours, if operations for critical, less critical, or non-critical Activities fall behind the Contractor's Baseline Schedule at any time during the construction period.

H. The City may, at any time during the Project and at no additional cost to the City, require the Contractor to develop a more detailed schedule/Fragnet than depicted in the Baseline Schedule to provide a clearer understanding of the effort needed to complete an Activity or group of Activities.

I. If the City determines that either the Critical Path is in the negative by four (4) weeks, or that the Project's date for completion may be affected, the Contractor may be required, at no additional cost to the City, to prepare a Recovery Schedule. Such Recovery Schedule is subject to review and acceptance by the City. The Recovery Schedule must propose alternative methods, overtime, and other means available to the Contractor to recover the delays incurred to date.

J. The Contractor must submit an "As-Built Schedule", as the last schedule update showing all Activities, with the exception of punch list and closeout tasks, at Substantial Completion. This schedule must reflect the exact manner in which the Project was actually constructed.

1.14 TIME IMPACT ANALYSIS:

A. In addition to the requirements of the Standard Construction Contract Article 11, the Contractor must submit a Time Impact Analysis to the Engineer with all requests for time extension.

B. The Time Impact Analysis must include a written narrative and supporting impact schedule Fragnet detailing the Project delays resulting from the alleged delay. The impact schedule Fragnet, separate and distinct from the Progress Schedule update, must demonstrate that the changes or anticipated delays affect Activities of the current accepted Progress Schedule. The impact schedule will be incorporated into the Progress Schedule only after it is accepted by the Commissioner and a time extension is approved. The Fragnet submitted as part of the Time Impact Analysis must illustrate the impact of these changes or delays on the date for Substantial Completion.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 32 16.30

SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 33

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes the following:
   1. Photographic Media
   2. Construction Photographs
   3. Pre-construction Photographs
   4. Periodic Construction Progress Photographs
   5. Special Photographs
   6. DVD Recordings
   7. Final Completion Construction Photographs

B. RELATED SECTIONS: include without limitation the following:
   1. Section 01 10 00 SUMMARY
   2. Section 01 33 00 SUBMITTAL PROCEDURES
   3. Section 01 35 91 HISTORIC TREATMENT PROCEDURES
   4. Section 01 78 39 CONTRACT RECORD DOCUMENTS
   5. Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS

C. PHOTOGRAPHER - The Contractor must employ and pay for the services of a professional photographer who will take photographs showing the progress of the Work.

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 SUBMITTALS:

A. Qualification Data: For photographer.

B. Key Plan: With each Progress Photograph Submittal include a key plan of Project site and building with notation of vantage points marked for location and direction of each image. Indicate location, elevation or story of construction. Include same label information as corresponding set of photographs.

C. Construction Progress Photograph Prints: Take Progress Photographs bi-weekly and submit four (4) color prints of each photographic view for each trade to the Commissioner. Such Progress Photographs must be included in each monthly progress report or as otherwise directed by the Commissioner.

D. Digital Files: Submit digital files in the format required.

1.5 QUALITY ASSURANCE:

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three (3) years.

1.6 COORDINATION:

A. The Contractor and its Subcontractor(s) must cooperate with the photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, such as temporary lighting required to produce clear and well-lit photographs without obscuring shadows.

1.7 COPYRIGHT:

A. The Contractor must include the provisions of this Subsection 1.7 in the agreement between the Contractor and the Photographer who will provide the construction photographs described in this Section. The Contractor must submit to the Commissioner a copy of its agreement with the Photographer.

B. Any photographs, images and/or other materials produced pursuant to this Agreement, and any and all drafts and/or other preliminary materials in any format related to such items produced pursuant to this Agreement, will, upon their creation, become the exclusive property of the City.

C. Any photographs, images and/or other materials provided pursuant to this Agreement ("Copyrightable Materials") will be considered "work-made-for-hire" within the meaning and purview of Section 101 of the United States Copyright Act, 17 U.S.C. § 101, and the City will be the copyright owner thereof and of all aspects, elements and components thereof in which copyright protection might exist. To the extent that the Copyrightable Materials do not qualify as "work-made-for-hire," the Photographer hereby irrevocably transfers, assigns and conveys exclusive copyright ownership in and to the Copyrightable Materials to the City, free and clear of any liens, claims, or other encumbrances. The Photographer will retain no copyright or intellectual property interest in the Copyrightable Materials. The Copyrightable Materials must be used by the Photographer for no purpose other than in the performance of this Agreement without the prior written permission of the City. The Department may grant the Photographer a license to use the Copyrightable Materials on such terms as determined by the Department and set forth in the license.

D. The Photographer acknowledges that the City may, in its sole discretion, register copyright in the Copyrightable Materials with the United States Copyright Office or any other government agency authorized to grant copyright registrations. The Photographer must fully cooperate in this effort and agrees to provide any and all documentation necessary to accomplish this.

E. The Photographer represents and warrants that the Copyrightable Materials: (i) are wholly original material not published elsewhere (except for material that is in the public domain); (ii) do not violate any copyright Law; (iii) do not constitute defamation or invasion of the right of privacy or publicity; and (iv) are not an infringement, of any kind, of the rights of any third party. To the extent that the Copyrightable Materials incorporate any non-original material, the Photographer has obtained all necessary permissions and clearances, in writing, for the use of such non-original material under this Agreement, copies of which must be provided to the City.

PART II – PRODUCTS

2.1 PHOTOGRAPHIC MEDIA:

A. Digital Images: Digital files must be captured as 7.2 megapixel files or greater, with a minimum pixel array of 2,400 pixels by 3,000 pixels. The camera used to capture the digital files must be a Digital SLR (Single Lens Reflex) camera or approved equal; "point and shoot" cameras or camera phones are not acceptable. Digital cameras must produce images using true optical resolution; "digital zoom" is not acceptable. Images must not be resized or interpolated. The file format for digital files must be Joint Photographic Experts Group format ("JPG"). The digital files must not be modified or processed in any way to alter the JPG file's metadata, including the photograph's original capture date.

B. Digital Files: Digital files must be submitted on Digital Versatile Disk ("DVD") or as specified by the Commissioner. DVDs must be inserted in standard weight Archival Quality clear poly sheet protectors and submitted in a hard cover three (3) ring binder. The information imprinted on each print must be provided on an Excel file included on the DVD. The DVD must be labeled with the Project ID and the Project description. Labeling using adhesive labels is not acceptable.

C. Prints:
   1. Format: 8-by-10-inch (203-by-254-mm) smooth-surface matte color prints on single-weight commercial-grade stock paper, with 1-inch wide margins and punched for standard 3-ring binder.
   2. Identification: On the front of each photograph affix a label in the margin with Project name and date photograph was taken. On the back of each print, provide an applied label or rubber-stamped impression with the following information:
      a. Project Contract I.D. Number.
      b. Project Contract Name.
      c. Name of Contractor. (and Subcontractor Trade Represented)
      d. Subject of Image Taken.
      e. Date and time photograph was taken if not date stamped by camera.
      f. Description of vantage point, indicating location, direction and other pertinent information.
      g. Unique sequential identifier.
      h. Name and address of photographer.

PART III – EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS:

A. General: Take photographs that provide the largest possible depth-of-field while still in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
   1. Maintain key plan with each set of construction photographs that identifies each photographic location and direction of view.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
   1. Date and Time: Include date and time in filename for each image.
   2. Field Office Images: Maintain one set of images on USB drive, or other electronic media requested by the Commissioner, in the field office at the Project site so that it is available at all times for reference. Ensure that the images are the same as for those submitted to Commissioner.

3.2 PRE-CONSTRUCTION & PRE-DEMOLITION PHOTOGRAPHS:

A. Before commencement of Contract Work at the Project site, take color photographs of Project site and surrounding properties, including existing structures or items to remain during construction, from different vantage points, as directed by the Commissioner.
   1. Flag applicable excavation areas and construction limits before taking construction photographs.

2. Take photographs of minimum eight (8) views to show existing conditions adjacent to property before starting the Work.
3. Take applicable photographs of minimum eight (8) views of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
4. Take additional photographs as required or directed by the Commissioner to record settlement or cracking of adjacent structures, pavements, and improvements.

B. Demolition Operations: Take photographs as directed by the Commissioner of minimum of eight (8) views each before commencement of demolition operations, at mid-point of operations and at completion of operations.

C. Pre-Demolition Photographs: Take archival quality color photographs, to include all exterior building facades, of all structures at the Project site designated to be fully demolished or removed in compliance with New York City Building Code requirements. Submit four (4) complete sets of pre-demolition photographs, in the format specified herein, to the Commissioner for submission to the New York City Department of Buildings.

3.3 PERIODIC CONSTRUCTION PROGRESS PHOTOGRAPHS:

A. Take photographs of minimum eight (8) views bi-weekly as directed by the Commissioner of construction progress for each contract trade. Select vantage points to show status of construction and progress since last photographs were taken.

3.4 SPECIAL PHOTOGRAPHS:

A. The photographer must take special photographs of subject matter or events as specified in other sections of the Project Specifications from vantage points specified or as otherwise directed by the Commissioner.

B. Historical Elements: As required in Section 01 35 91 HISTORIC TREATMENT PROCEDURES, for Contract Work at designated landmark structures or sites, the photographer, as specified and required by individual sections of the Contract documents or at the direction of the Commissioner, must take images of existing elements scheduled to be removed for replacement, repair or replication in quantities as directed, including post-construction photographs of completed Work as directed by the Commissioner.

1. Take Presentation Quality Photographs of designated landmark structures as directed by the Commissioner for submission to the New York City Landmarks Preservation Commission. Provide a minimum of four (4) color photographic prints of each view as directed.

3.5 VIDEO RECORDING:

A. When Video Recording of Demonstration and Orientation sessions is required, the Contractor must provide the services of a Videographer as indicated in Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

3.6 FINAL COMPLETION CONSTRUCTION PHOTOGRAPHS:

A. For submission as Project Record Documents, take color photographs of minimum eight (8) unobstructed views of the completed Project and/or Project site, as directed by the Commissioner and after all scaffolding, hoists, shanties, field offices or other temporary work has been removed and final cleaning has been done after date of Substantial Completion. Submit four (4) sets of each view of Presentation Quality photographic prints, including negatives and/or digital images electronic file.

END OF SECTION 01 32 33

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART I – GENERAL:

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Coordination Drawings, Catalogue Cuts, Material Samples, and other Submittals required by the Contract Documents.
B. Review of Submittals does not relieve the Contractor of responsibility for any Contractor's errors or omissions in such Submittals, nor from responsibility for complying with the requirements of the Contract.
C. Responsibility of the Contractor: The approval of Shop Drawings will be general and will not relieve the Contractor of the following responsibilities:
   1. Accuracy of such Shop Drawings;
   2. Proper fitting and construction of the Work
   3. Furnishing of materials or Work required by the Contract that may not be indicated on the Shop Drawings.
D. Approval of Shop Drawings must not be construed as approving departures from the Contract Drawings, Supplementary Drawings, or Specifications.
E. This Section includes the following:
   1. Definitions
   2. Submission Procedures
   3. Coordination Drawings
   4. LEED Submittals
   5. Ultra Low Sulfur Diesel Fuel Reporting
   6. Construction Photographs and Recordings
   7. As-Built Documents

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
D. Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION
E. Section 01 40 00 QUALITY REQUIREMENTS
F. Section 01 77 00 CLOSEOUT PROCEDURES
G. Section 01 78 39 CONTRACT RECORD DOCUMENTS
H. Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS
I. Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS
J. Section 01 81 13.10 ENVIRONMENTALLY PREFERABLE PURCHASING (EPP) COMPLIANCE

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and Specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Action Submittals: Written and graphic information, or physical samples that require responsive actions and include, without limitation, all Shop Drawings, product data, letters of certification, tests and other information required for quality control and as required by the Contract Documents.

D. Informational Submittals: Written and graphic information that does not require responsive action. Informational Submittals may be rejected for non-compliance with the Contract.

E. Shop Drawings: Drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, except for coordination drawings, specifically prepared for the Project by the Contractor or any Subcontractor, manufacturer, supplier or distributor, which illustrates how specific portions of the Work must be fabricated and/or installed.

F. Coordination Drawings: As required in Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.

G. Product Data and Quality Assurance Submittals: Includes manufacturer's standard catalogs, pamphlets, and other printed materials including without limitation the following:

1. Catalogue and Product specifications
2. Installation instructions
3. Color charts
4. Catalog cuts
5. Rough-in diagrams and templates
6. Wiring diagrams
7. Performance curves
8. Operational range diagrams
9. Mill reports
10. Design data and calculations
11. Certification of compliance or conformance
12. Manufacturer's instructions and field reports

1.5 COORDINATION DRAWINGS:

A. Coordination Drawings, General: When coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity, or where limited space availability necessitates coordination, prepare Coordination Drawings according to requirements in individual Sections as a prerequisite to submittal of Shop Drawings.

1. Content: Project-specific information, shown accurately to a scale large enough to indicate and resolve conflicts. Do not base Coordination Drawings on standard printed data. Include the following information, as applicable for the Project:

    a. Use applicable background views as a basis for preparation of coordination layouts. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    b. Coordinate the addition of trade-specific information by multiple contractors in a sequence that best presents the information and resolution of conflicts between installed components, before submitting for review.
    c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, plumbing, fire protection, and electrical systems.
    d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
    f. Indicate required installation sequences.
    g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Commissioner indicating proposed resolution of such conflicts.

B. Coordination Drawing Organization: Organize Coordination Drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling raised access floor and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide Coordination Drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:

    a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    c. Fire-rated enclosures around ductwork.
    d. HVAC equipment

7. Electrical Work: Show the following:

    a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
    b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    c. Panel board, switch board, switchgear, transformer, busway, generator, and motor-control center locations.
    d. Location of pull boxes and junction boxes, dimensioned from column center lines.

e. Indicate runs and locations of Audio Visual and Information Technology, and security devices.

8. Fire-Protection System: Show the following:

a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

C. The Contractor must issue the completed Coordination Drawing(s) to the Design Consultant for his/her review. The Design Consultant may call as many meetings as necessary with the Contractor, including attendance by applicable Subcontractors, and may call on the services of the applicable sub consultant(s) where necessary, to resolve any conflicts that become apparent.

D. Upon resolution of any conflicts, the Contractor must provide a final Coordination Drawing(s) which will become the Master Coordination Drawing(s). The Master Coordination Drawing(s) must be signed and dated by the Contractor to indicate acceptance of the arrangement of the Work.

E. A reproducible copy of the Master Coordination Drawing(s) must be provided by the Contractor to each of the appropriate Subcontractor(s), the Resident Engineer and the Design Consultant for information.

F. Shop Drawings must not be submitted prior to acceptance of the final coordinated drawings and must be prepared in accordance with the Master Coordination Drawing(s). No work will be permitted without accepted Shop Drawings. It is therefore essential that this procedure be instituted as quickly as possible.

G. Coordination Drawing Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as original Design Drawings.
2. File Submittal Format: Submit or post coordination drawing files using PDF format.
3. BIM File Incorporation: Submit or post coordination drawing files using PDF format, unless otherwise directed by Commissioner.
4. Commissioner will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.

a. Contractor must execute Digital Data File Release and indemnification form provided by Commissioner.
b. Commissioner makes no representations as to the accuracy or completeness of digital data files as they relate to coordination drawings.

1.6 SUBMITTAL PROCEDURES:

A. Refer to Section 01 35 03 GENERAL MECHANICAL REQUIREMENTS and Section 01 35 06 GENERAL ELECTRICAL REQUIREMENTS for additional Submittal requirements involving electrical and mechanical work or equipment of any nature called for in the Project.

B. Coordination: Coordinate preparation and processing of Submittals with performance of construction activities.

1. Coordinate each Submittal with fabrication, purchasing, testing, delivery, other Submittals, and related activities that require sequential activities, with the Submittal Schedule specified in Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION.
2. Coordinate transmittal of different types of Submittals for related parts of the Work so processing will not be delayed because of need to review Submittals concurrently for coordination.
3. The Commissioner reserves the right to withhold action on a Submittal requiring coordination with other Submittals until related Submittals are received.

C. Identification: Place a permanent label or title block on each Submittal for identification.

1. Indicate name of firm or entity that prepared each Submittal on label or title block.

2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Design Consultant.

3. Include the following minimum information on label for processing and recording action taken:
   a. Project name, DDC Project Number, and Contract Number
   b. Date
   c. Name and address of Design Consultant
   d. Name and address of Contractor
   e. Name and address of Subcontractor
   f. Name and address of supplier
   g. Name of manufacturer
   h. Submittal number or other unique identifier, including revision identifier
   i. Number and title of appropriate Specification Section
   j. Drawing number and detail references, as appropriate
   k. Location(s) where product is to be installed, as appropriate
   l. Other necessary identification

D. PDF Submittals:

1. Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number. Bind transmittal form with each submittal file package. Transmittal form must be the first page in the PDF file constituting the submittal.

2. Submittal files received from sources other than the Contractor will be rejected without review. Re-submission of the same drawings or product data must bear the original number of the prior submission and the original titles.

E. Web-Based Project Software Submittals: Prepare submittals as PDF files, or other format indicated by Project software website.

F. Transmittal Form: Provide locations on form for the following information:

1. Project name, DDC Project number and Contract Number
2. Date
3. Destination (To:)
4. Source (From:)
5. Names of Contractor, Subcontractor, manufacturer, and supplier
6. Category and type of Submittal
7. Submittal purpose and description
8. Specification Section number and title
9. Drawing number and detail references, as appropriate
10. Transmittal number, numbered consecutively
11. Submittal and transmittal distribution record
12. Remarks
13. Signature of transmitter

G. Shop Drawings:

1. Procedures for Preparing, Forwarding, Checking, and Returning all Shop Drawings must be, generally, as follows:

   a. The Contractor must make available to its Subcontractors the necessary Contract Documents and must instruct such Subcontractor to determine dimensions and conditions in the field, particularly in reference to coordination between the trade Subcontractors. The Contractor must direct its Subcontractors to prepare Shop Drawings for submission to the Design

Consultant in accordance with the requirements of these General Conditions. The Contractor must also direct its Subcontractors to "Ring Up" corrections made on all re-submissions for approval, so as to be readily seen, and that the appropriate symbol per item 2 below (e.g., "GC") be used to identify the source of the correction or information that has been added.

The Contractor must:

1. Review and be responsible for information shown on its Subcontractor's Shop and Installation Drawings and manufacturers' data, and conformity to Contract Documents.
2. "Ring Up" corrections made on all submissions for approval, so as to be readily seen, and that the symbol "GC", "PL", "HVAC", or "EL" be used to indicate that the correction and/or information added was made by the Contractor and/or its Subcontractor(s).
3. Clearly designate which entity is to perform the Work when the term, "work by others" or other similar phrases are indicated on the Contract Drawings before submission to the Design Consultant.
4. Stamp submissions "Recommended for Acceptance", date and forward to the Design Consultant.

2. The Contractor must promptly prepare and submit project specific layout detail and Shop Drawings of such parts of the Work as are indicated in the Specifications, or as required. These Shop Drawings must be made in accordance with the Contract Drawings, Specifications and Supplementary Drawings, if any. The Shop Drawings must be accurate and distinct and give all the dimensions required for the fabrication, erection, and installation of the Work.

3. Size of Drawings: The Shop Drawings, unless otherwise directed, must be on sheets of the same size as the Contract Drawings, drawn accurately and of sufficient scale to be legible, with a one half (1/2) inch marginal space on each side and a two (2) inch marginal space for binding on the left side.

4. Scope of Drawings: Shop Drawings must be numbered consecutively and must accurately and distinctly represent all aspects of the Work, including without limitation the following:

   a. All working and erection dimensions
   b. Arrangements and sectional views
   c. Necessary details, including performance characteristics and complete information for making necessary connections with other Work
   d. Kinds of materials including thickness and finishes
   e. Identification of products
   f. Fabrication and installation drawings
   g. Roughing-in and setting diagrams
   h. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring
   i. Shop work manufacturing instructions
   j. Templates and patterns
   k. Schedules
   l. Design calculations
   m. Compliance with specified standards
   n. Notation of coordination requirements
   o. Notation of dimensions established by field measurement
   p. Relationship to adjoining construction clearly indicated
   q. Seal and signature of professional engineer if specified
   r. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring
   s. All other information necessary for the Work and/or required by the Commissioner

5. Titles and Reference: Shop Drawings must be dated and contain:
   a. Name of the Project, DDC Project Number, and Contract Number
   b. The descriptive names of equipment or materials covered by the Contract Drawings and the classified item number or numbers.

c. The locations or points and sequence at which materials, or equipment, are to be installed in the Work
d. Cross references to the section number, detail number, and paragraph number of the Contract Specifications
e. Cross references to the sheet number, detail number, etc., of the Contract Drawings

6. Field Measurements: In addition to the above requirements, the Shop Drawings must be signed by the Contractor and, if applicable, the Subcontractor responsible for preparation of the Shop Drawings. Each Shop Drawing must be stamped with the following wording:

> FIELD MEASUREMENTS: The Contractor certifies that it has verified and supplemented the Contract Drawings by taking all required field measurements, which said measurements correctly reflect all field conditions and that this Shop Drawing incorporates said measurements.

7. Contractor's Statement with Submittal: Any Submittal by the Contractor for acceptance, including without limitation, all dimensional drawings of equipment, blueprints, catalogues, models, samples and other data relative to the equipment, the materials, the Work or any part thereof, must be accompanied by a statement that the Submittal has been examined by the Contractor and that everything shown in the Submittal is in accordance with the requirements of the Contract Drawings and Specifications. If there is any discrepancy between what is shown in the Submittal and the requirements of the Contract Drawings and Specifications, the Contractor must, in its statement, list and clearly describe each discrepancy.

8. Acceptance will be given based upon the Contractor's representation that what is shown in the Submittal is in accordance with the requirements of the Contract Drawings and Specifications. If the Contractor's statement indicates any discrepancy between what is shown in the Submittal and the requirements of the Contract Drawings and Specifications, such change is subject to review and prior written acceptance by the Design Consultant. In addition, such change may require a change order in accordance with Article 25 of the Contract. In the event any such change is approved, any additional expense or increased cost in connection with the change is the sole responsibility of the Contractor.

9. Submission of Shop Drawings:

a. Initial Submission: The Contractor must submit seven (7) copies, or as requested by the Resident Engineer, of each Shop Drawing to the Design Consultant for his/her review and acceptance. If PDF drawings are requested by the Resident Engineer, they must be provided in an original "printed from digital" format, and not scanned. The Design Consultant will transmit Shop Drawings to appropriate sub-consultants for review and acceptance, including Commissioning Authority/Agent as applicable. A satisfactory Shop Drawing will be digitally stamped "No Exceptions Taken", be dated and transmitted by the Design Consultant as follows:

1) Addressed to the Contractor, with a cc to the following:

a) Design Consultant's sub consultant(s) as appropriate
b) DDC

2) Should the Shop Drawing(s) be "Rejected" or noted "Revise and Resubmit" by the Design Consultant, the Design Consultant will transmit the Shop Drawings to the Contractor with the necessary corrections and changes to be made as indicated thereon.

b. Revisions: The Contractor must make such corrections and changes and again transmit each shop drawing to the Design Consultant. The Contractor must revise and resubmit the Shop Drawing as required by the Design Consultant until the Shop Drawings are stamped “No Exceptions Taken”. However, Shop Drawings which have been stamped "Make Corrections Noted" will be considered an "Acceptable" Shop Drawing and NEED NOT be resubmitted.

c. Commencement of Work: No Work or fabrication called for by the Shop Drawings must be done until the acceptance of the said drawings by the Design Consultant is given. In addition to the foregoing Shop Drawing transmissions, a copy of any Shop Drawing prepared by any of the Contractor’s Subcontractors which Shop Drawing indicated Work related to, adjacent to, impinging upon, or affecting Work to be done by other Subcontractors must be transmitted to the Subcontractors so affected. [These accepted Shop Drawings must be distributed to the affected Subcontractors when required with a copy of the transmittal to the Resident Engineer.]

d. Variations: If the Shop Drawings show variations from the Contract requirements because of standard shop practice or other reasons, the Contractor must make specific mention of such variations in its letter of Submittal. Acceptance of the Shop Drawings must constitute acceptance of the subject matter thereof only and not of any structural apparatus shown or indicated.

H. Product Data:

1. General: Except as otherwise prescribed herein, the submission, review, and acceptance of Product Data and Catalogue cuts must conform to the procedures specified in subsection 1.6 E, Shop Drawings.

2. If information must be specially prepared for the Submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.

3. Mark each copy of the Submittal to show which products and options are applicable.

4. Include the following information, as applicable:

   a. Manufacturer's written recommendations.
   b. Manufacturer's product specifications.
   c. Manufacturer's installation instructions.
   d. Standard color charts.
   e. Manufacturer's catalog cuts.
   f. Wiring diagrams showing factory-installed wiring.
   g. Printed performance curves.
   h. Operational range diagrams.
   i. Mill reports.
   j. Standard product operation and maintenance manuals.
   k. Compliance with specified referenced standards.
   l. Testing by recognized testing agency.
   m. Application of testing agency labels and seals.
   n. Notation of coordination requirements.

5. Submit Product Data before or concurrent with Samples.

6. Submission of Product Data:

   a. Initial Submission: The Contractor must submit seven (7) sets of Product Data to the Design Consultant for his/her review and acceptance. The Design Consultant will transmit Product Data to appropriate sub-consultants for review and acceptance, including Commissioning Authority/Agent as applicable. A satisfactory catalogue cut will be digitally stamped "No Exception Taken", be dated and transmitted as follows:

1) Addressed to the Contractor, with a cc to the following:

a) Design Consultant's sub consultant(s) as appropriate
b) DDC

2) Should the Product Data be “Rejected” or noted “Revise and Resubmit” by the Design Consultant, the Design Consultant will return one (1) set of such Product Data to the Contractor with the necessary corrections and changes to be made indicated and one (1) set to DDC.

7. Revisions: The Contractor must make such corrections and changes and again submit seven (7) copies of each Product Data for the review of the Design Consultant. The Contractor must revise and resubmit the Product Data as required by the Design Consultant until the submission is stamped “No Exceptions Taken” by the Design Consultant. However, Product Data which has been stamped "Make Corrections Noted" must be considered an "Accepted" Product Data and NEED NOT be resubmitted.

I. Samples of Materials:

1. For samples of materials involving electrical Work of any nature, refer to Section 01 35 06 GENERAL ELECTRICAL REQUIREMENTS.

2. Samples must be in triplicate or as directed by the Resident Engineer, and of sufficient size to show the quality, type, range of color, finish and texture of the material.

3. Each of the samples must be labeled as follows:

a. Name of the Project, DDC Project Number and Contract Number
b. Name and quality of the material
c. Date
d. Name of Contractor, subcontractor, manufacturer and supplier
e. Related Specification or Contract Drawing reference to the samples submitted

4. A letter of transmittal, in triplicate, from the Contractor requesting acceptance must accompany all such samples.

5. Transportation charges to the Design Consultant’s office must be prepaid on all samples forwarded.

6. Samples for testing purposes must be as required in the Specifications.

7. Samples on Display: When samples are specified to be equal to approved product, they must be carefully examined by the Contractor and by those whom the Contractor expects to employ for the furnishing of such materials.

8. Timely Submissions Log/Schedule: Samples must be submitted in accordance with approved Shop Drawing log so as to permit proper consideration without delaying any operation under the Project. Materials should not be ordered until acceptance is received, in writing, from the Design Consultant. All materials must be furnished equal in every respect to the accepted samples.

9. The acceptance of any samples will be given as promptly as possible, and will be only for the characteristic color, texture, strength, or other feature of the material named in such acceptance, and no other. When this acceptance is issued by the Design Consultant, it is done with the distinct understanding that the materials to be furnished will fully and completely comply with the Specifications, the determination of which may be made at some later date by a laboratory test or by other procedure. Use of materials will be permitted only so long as the quality remains equal to the approved samples and complies in every respect with the Specifications, and the colors and textures of the samples on file in the office of the Design Consultant, for the Project.

10. Acceptability of test Data: The Commissioner will be the final judge as to acceptability of laboratory test data and performance in service of materials submitted.

11. Valuable Samples: Valuable samples, such as hardware, plumbing and electrical fixtures, etc., not destroyed by inspection or test, will be returned to the Contractor and may be incorporated into the Work after all questions of acceptability have been settled, providing suitable permanent records are made as to the location of the samples, their properties, etc.

J. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.

K. Supplementary Qualification Data: Prepare written information that demonstrates capabilities and experience of entity. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

L. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

M. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.

2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS formats. Include names of firms and personnel certified.

N. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

O. Equivalent Quality: Any material, article and/or equipment which is designated in the Drawings and/or Specifications by a number in the catalogue of any manufacturer or by a manufacturer's grade or trade name is designated for the purpose of describing the material, article and/or equipment and fixing the standard of performance and/or function, as well as the quality and/or finish. Any material, article and/or equipment which is other than what is specified in the Drawings and/or Specifications will only be accepted if the Commissioner makes a written determination that such material, article and/or equipment is equivalent to that which is specified in the Drawings and/or Specifications.

P. The submission of any material, article and/or equipment as the equal of any material, article and/or equipment set forth in the Drawings and/or Specifications as a standard must be accompanied by any and all information essential for determining whether such proposed material, article and/or equipment is equivalent to that which is specified. Such information must include, without limitation, illustrations, drawings, descriptions, catalogues, records of tests, samples, as well as information regarding the finish, durability and satisfactory use of such proposed material, article and/or equipment under similar operating conditions.

Q. Engineering Services Submittals:

1. Performance and Design Criteria: Refer to Section 01 40 00 QUALITY REQUIREMENTS, Article 1.5.

2. Engineering Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and three paper copies of certificate, signed and sealed by the responsible professional engineer, for each product and system specifically required of the Contractor to be designed or certified by a professional engineer.

    a. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

3. BIM Incorporation: Incorporate engineering services drawing and data files into BIM established for

Project.

a. Prepare engineering services documents in the required formats, including BIM incorporation.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.7

1.7 LEED SUBMITTALS:

A. Comply with Submittal requirements specified in the following sections:

1. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL;
2. Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS, as applicable;
3. Section 01 81 13.13 VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS;
4. Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS;
5. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS; and/or,
6. Section 01 91 15 BUILDING ENCLOSURE COMMISSIONING REQUIREMENTS.

B. LEED Building Submittal information must be assembled into one package per each applicable Specification Section, separate from all other non-LEED Submittals. Each Submittal package must have a separate transmittal and identification as described in Subsection 1.5 herein.

C. Number of Copies: Submit four (4) copies of LEED Submittals, in accordance with procedure described in Article 1.5 herein, unless otherwise indicated.

D. Material Safety Data Sheets (MSDSs) for LEED Certification: Submit information necessary to show compliance with LEED certification requirements, which will be the limit of the Design Consultant's review for LEED compliance.

1. Designated LEED Submittals that include non-LEED MSDS data will not be reviewed. The entire Submittal will be returned for re-submission.

E. Product Cut Sheets and/or Shop Drawings for LEED Certification: Provide product cut sheets and/or shop drawings with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project. For detailed requirements refer to Subsection 1.6 of Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 PROJECTS, or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

1. Provide the quantity, length, area, volume, weight, and/or cost of each product submitted as required to satisfy LEED documentation requirements. Refer to Subsection 1.6 of Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 PROJECTS.

1.8 ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING:

A. In accordance with Section 01 10 00 SUMMARY, Subsection 1.10 E**,** the Contractor must submit reports to the Commissioner regarding the use of Ultra Low Sulfur Diesel Fuel and Best Available Technology (BAT) in Non road Vehicles. Submission of such reports must be in accordance with the schedule, format, directions and procedures established by the Commissioner.

1.9 CONSTRUCTION PHOTOGRAPHS AND VIDEO RECORDINGS:

A. Submit construction progress photographs and Video recordings in accordance with requirements of Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION.

1.10 AS-BUILT DOCUMENTS:

A. Submit all as-built documents in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 33 00

SECTION 01 35 03
GENERAL MECHANICAL REQUIREMENTS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 03

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. The General Mechanical Requirements contained herein must be followed by the Contractor, as well as its Subcontractor for HVAC work. This Section sets forth the General Requirements applicable to mechanical work for the Project. Such requirements are intended to be read in conjunction with the Specifications and Contract Drawings for the Project. In the event of any conflict between the requirements set forth in this Section and the requirements of the Specifications and/or the Contract Drawings, whichever requirement is the most stringent must take precedence.

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 35 06 GENERAL ELECTRICAL REQUIREMENTS
D. Section 01 42 00 REFERENCES
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. CONCEALED PIPING AND DUCTS: piping and ducts hidden from sight in masonry or other construction, in floor fill, trenches, partitions, hung ceilings, furred spaces, pipe shafts and in service tunnels not used for passage. Where piping and ducts run in areas that have hung ceilings, such piping and ducts must be installed in the hung ceilings. For Work on existing piping, any insulation on such existing piping is to be tested for asbestos and abated if found to be positive by a certified asbestos contractor. Such testing and abatement must occur prior to the performance of any Work on these pipes.

1.5 SUBMITTALS:

A. INTENT OF MECHANICAL CONTRACT DRAWINGS – Mechanical Contract Drawings are, in part, diagrammatic and show the general arrangement of the equipment, ducts, and piping included in the Contract and the approximate size and location of the equipment.

B. The Contractor must follow these Contract Drawings in laying out the Work and verify the spaces in which it will be installed. The Contractor must submit, as directed, Mechanical Shop Drawings, roughing drawings,

manufacturer's Shop Drawings, field drawings, cuts, bulletins, etc., of all materials, equipment and methods of installation shown or specified in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1. Submit sheet metal shop standards. Submit manufacturer's product data including gauges, materials, types of joints, scaling materials and installations for metal ductwork materials and products.
2. Submit scaled layout drawing (3/8"=1') of metal ductwork and fittings including, but not limited to, duct sizes, locations, elevations, slopes of horizontal runs, wall and floor penetrations and connections. Show modifications of indicated requirements made to conform to local shop practice and how those modifications ensure that free area, materials and rigidity are not reduced. Layouts should include all the room plans, mechanical equipment rooms and penthouses. Method of attachment of duct hangers to building construction all with the support details. Coordinate Shop Drawings with related trades prior to submission.
3. Indicate duct fittings, particulars such as gauges, sizes, welds and configuration prior to start of work for low-pressure systems.
4. Submit maintenance data and parts lists for metal ductwork materials and products. Include this data, product data and shop drawings in maintenance manual.

1.6 ACCESS:

A. All Work must be installed by the Contractor to readily provide access for inspection, operation, maintenance and repair. Minor deviations from the arrangement indicated on the Contract Drawings may be made to accomplish this, but they must not be made without prior written approval by the Commissioner.

1.7 CHANGES IN PIPING, DUCTS, AND EQUIPMENT:

A. Wherever field conditions are such that for proper execution of the Work, reasonable changes in location of piping, ducts, and equipment are necessary and required, the Contractor must make such changes as directed and approved, without extra cost to the City.

1.8 CLEANING OF PIPING, DUCTS, AND EQUIPMENT:

A. Piping, ducts, and equipment must be thoroughly cleaned by the Contractor of all dirt, cuttings, and other foreign substances. Should any pipe, duct, or other part of the several systems be obstructed by any foreign matter, the Contractor will be required to pay for disconnecting, cleaning, and reconnecting wherever necessary for the purpose of locating and removing obstructions. The Contractor must pay for repairs to other work damaged in the course of removing obstructions. For work on existing piping, ducts, and equipment, the Contractor must pay special attention during this task so as not to disturb the insulation on such piping, ducts, or equipment.

1.9 STANDARDIZATION OF SIMILAR EQUIPMENT:

A. Unless otherwise particularly specified, all equipment of the same kind, type, or classification, used for identical purposes, must be the product of one (1) manufacturer.

1.10 SUPPORTING STRUCTURES DESIGNED BY THE CONTRACTOR:

A. Unless otherwise specified, supporting structures for equipment to be furnished by the Contractor must be designed by a Professional Engineer licensed in the State of New York retained by the Contractor. Supporting structures must be built by the Contractor of sufficient strength to safely withstand all stresses to which they

may be subjected, within permissible deflections, and must meet the following standards:

1. Structural Steel - ASTM Standard Specifications, AISC and New York City Construction Codes.
2. Concrete for supports for equipment must conform to the Specifications for concrete herein, but in no case must be less than the requirements of the New York City Construction Codes for average concrete.
3. Steel reinforcement for concrete must be of intermediate grade and must meet the requirements of the Standard Specifications for Billet Steel-Concrete Reinforcement Bars, ASTM.
4. Drawings and calculations must be submitted for review and acceptance in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1.11 ELIMINATION OF NOISE:

A. All systems and/or equipment provided under the Contract must operate without objectionable noise or vibration.

B. Should operation of any one or more of the several systems produce noise or vibration which is, in the opinion of the Commissioner, objectionable, the Contractor must, at its own expense, make changes in piping, equipment, etc., and do all work necessary to eliminate objectionable noise or vibration.

C. Should noise or vibration that is found objectionable by the Commissioner be transmitted by any pipe or portions of the structure from systems and/or equipment installed under the Contract, the Contractor must, at its own expense, install such insulators and make such changes in or additions to the installations as may be necessary to prevent transmission of this noise or vibration.

1.12 PRELIMINARY FIELD TEST:

A. As soon as conditions permit, the Contractor must furnish all necessary labor and materials for, and must make preliminary field tests of the equipment to ascertain compliance with the requirements of the Contract. If the preliminary field tests disclose equipment that does not comply with the Contract, the Contractor must, prior to the acceptance test, make all changes, adjustments, and replacements as required.

1.13 INSTRUCTIONS ON OPERATION:

A. At the time the equipment is placed in permanent operation by the City, the Contractor must make all adjustments and tests required by the Commissioner to prove that such equipment is in proper and satisfactory operating condition. The Contractor must instruct the City's operating personnel on the proper maintenance and operation of the equipment for the period of time called for in the Specifications.

1.14 CERTIFICATES:

A. On completion of the Work, the Contractor must obtain certificates of inspection, approval, and acceptance, and be in compliance with all laws from all agencies and/or entities having jurisdiction over the Work and must deliver these certificates to the Commissioner in accordance with Section 01 77 00 CLOSEOUT PROCEDURES. The Work will not be deemed substantially complete until the certificates have been delivered.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 35 03

SECTION 01 35 06
GENERAL ELECTRICAL REQUIREMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section sets forth the General Requirements applicable to electrical work for the Project. Such requirements are intended to be read in conjunction with the Specifications and Contract Drawings for the Project. In the event of any conflict between the requirements set forth in this Section and the requirements of the Project Specifications and/or the Contract Drawings, whichever requirement is the most stringent, as determined by the Commissioner, must take precedence.

B. This Section includes the following:
   1. Related Sections
   2. Definitions
   3. Procedure for Electrical Approval
   4. Submittals
   5. Electrical Installation Procedures
   6. Electrical Conduit System Including Boxes (Pull, Junction and Outlet)
   7. Electrical Wiring Devices
   8. Electrical Conductors and Terminations
   9. Circuit Protective Devices
   10. Distribution Centers
   11. Motors
   12. Motor Control Equipment

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 35 03 GENERAL MECHANICAL REQUIREMENTS
D. Section 01 42 00 REFERENCES
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. WIRING: contains wire and raceway (rigid steel, heavy wall conduit unless specifically indicated otherwise).

B. POWER WIRING: wiring from a panel board or other specified source to a starter (if required), then to a disconnect (if required), then to the final point of usage such as a motor, unit, or device.

C. CONTROL and/or INTERLOCK WIRING: wiring that signals the device to operate or shut down in response to a signal from a remote control device such as a temperature, smoke, pressure, float, etc. device (starters and disconnect switches are not included in this definition) regardless of the voltage required for the controlling device.

D. RIGID STEEL CONDUIT: rigid steel heavy wall conduit that is hot-dip galvanized inside and outside. The conduit must meet the requirements of the latest edition, as amended, of the "Standard for Rigid Steel Conduit" of the Underwriters' Laboratories, Inc. Unless otherwise specified in the Specifications or indicated on the Contract Drawings, rigid steel conduit must be used for all exposed work, all underground conduits in contact with earth, and fire alarms systems, as required by the New York City Construction Codes.

E. ELECTRICAL METALLIC TUBING (EMT): industry standard thin wall conduit of galvanized steel. All elbows, bends, couplings and similar fittings which are installed as a part of the conduit system must be compatible for use with electric metallic tubing. Couplings and terminating fittings must be of the pressure type as approved by the Commissioner. Set screw fittings will not be acceptable. EMT must meet the requirements of the latest edition, as amended, of the "Standard for Electrical Metallic Tubing" of the Underwriters Laboratories Inc. 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.

8. Exposed conduits must be installed parallel or at right angles to ceilings, walls and partitions. Where direction changes of exposed conduit cannot be made with neat bends, as may be required around beams or columns, conduit-type fittings must be used.

9. Conduit must be installed with an expansion joint approved by the Commissioner in the following conditions:

    a. Wherever the conduit crosses a building expansion joint, the Contractor will be held responsible for determining where the building expansion joints are located.

    b. Every 200 feet, when in straight runs of 200 feet or longer.

10. Conduits may only enter and leave a floating slab in a vertical direction, and only in an approved manner. Horizontal entries into floating slabs are not permitted.

11. Conduits installed in pipe shafts must be properly supported to carry the total weight of the raceway system complete with cable. In addition, at least one (1) horizontal brace per 10 ft. section must be provided to assure stability of the raceway system.

12. BUSHINGS AND LOCKNUTS: Approved bushings and locknuts must be used wherever conduits enter outlet boxes, switch boxes, pull boxes, panel board cabinets, etc.

13. CONDUIT BENDS: must be made without kinking conduit or appreciably reducing the internal diameter. All bends in conduits of two (2) inch in diameter or larger must be made with a hydraulic or power pipe bender. The radius of the inner edge of any bend must not be less than six (6) times the internal diameter of the conduit where rubber covered conductors are to be installed, and not less than ten (10) times the internal diameter of the conduit where lead covered conductors are to be used. Long gradual sweeps will be required, rather than sharp bends, when changes of direction are necessary.

14. EMPTY CONDUITS

    a. TESTS: All conduits and ducts required to be installed and left empty must be tested for clear bore and correct installation by the Contractor using a ball mandrel and a brush and snake before the installation will be accepted. The ball must be turned to approximately 85% of the internal diameter of the raceway to be tested. Two (2) short wire brushes must be included in the mandrel assembly. Snaking of conduits, ducts, etc., must be performed by the Contractor in the presence of the Resident Engineer. Any conduits or ducts which reject the mandrel must be cleared at once with the Contractor bearing all costs, such as chopping concrete, to replace the defective conduit and restore the surface to its original condition.

    b. TAGS: Numbers or letters must be assigned to the various conduit runs, and as they test clear they must be identified by a fiber tag not less than 1-¼ inch width, attached by means of a nylon cord. All conduit terminations in panel, splice or pull boxes, as well as those out of the floor or ceiling, must be tagged.

    c. TEST RECORDS: As the conduit runs clear, a record must be kept under the heading of "Empty Conduit Tested, Left Clear, Tagged and Capped" showing conduit designation, diameter, location, date tested and by whom. When complete, this record must be signed by the Resident Engineer and submitted in triplicate for approval. This record must be entered on the Contract Record Drawings under Section 01 78 39 CONTRACT RECORD DOCUMENTS.

    d. CAPPING: After test, all empty conduit and duct openings, must be capped or plugged by the Contractor as directed.

    e. DRAG LINES: A drag line must be left in all empty conduit.

B. BOXES:

1. The Contractor must furnish and erect all pull boxes indicated on the plans or where required. Sides, top and bottom of pull boxes must be Galvanized coated and must be built of No. 12 USSG steel reinforced at corners by substantial angle irons and riveted or welded to plates. Bottom or side of pull boxes must be removable and held in place by corrosion resistant machine screws. Pull boxes in damp locations must have threaded hubs and gaskets and be NEMA 4X. All pull boxes must be suspended from ceiling or walls in the most substantial manner.

2. In centering outlets, the Contractor is cautioned to allow for overhead pipes, ducts and other obstructions, and for variations in arrangement and thickness of fireproofing, soundproofing and plastering. Precaution should be exercised regarding the location of window and door trims, paneling, etc. Mistakes resulting from failure to exercise precaution must be corrected by the Contractor at no additional cost to the City. Outlets in hung ceilings must be supported from the black iron or structure.

3. The exact location of all outlets in finished rooms must be as directed by the Commissioner. When the interior finish has been applied, the Contractor must make any necessary adjustment of its work to properly center the outlets. All outlet boxes for local switches near doors must be located at the strike side of doors as finally hung, whether so indicated on the drawings or not.

4. Exposed wall outlet boxes must be securely anchored, erected neatly and tight against the walls.

5. All wall outlets of each type must be set accurately at the same level on each floor, except where otherwise specified or directed by the Commissioner. Where special conditions occur, outlets must be located as directed.

6. MOUNTING HEIGHTS: The following heights are standard heights and are subject to correction due to coordination with Contract Drawings. All such changes must be approved by the Resident Engineer. Heights given are from finished floor to center line of outlet or device on wall or partition, unless otherwise indicated.

a.	General Convenience Outlets (mount vertical)	1'-6"
b.	Clock Outlets	8'-6"or 1'-6" below ceiling
c.	Wall Lighting Switches	4'-0"
d.	Motor Controllers	5'-0"
e.	Motor Push-button	4'-2"
f.	Telephone Outlets	As Directed by the Commissioner
g.	Fire Alarm Bells	8'-6"or 1'-6" below ceiling
h.	Fire Alarm Stations	4'-0"
i.	Intercom Outlet	1'-6"
j.	Cooking and Refrigerator Unit	As Directed

7. Outlet boxes must be of a design and construction approved by the Commissioner. The type of box, including its form and dimensions, must be appropriate for: its specific location; the kind of fixture to be used; and, the conduits (both quantity and type) that will connect to it. All ferrous outlet boxes must meet the requirements for zinc coating as specified under Electrical Conduit Systems.

8. Knockouts will only be opened to insert conduit. Any outlet boxes with more openings than are necessary for conduit insertion must be sealed by the Contractor without additional charge.

9. All outlet boxes and junction boxes for exposed work must be galvanized cast iron or cast aluminum with threaded openings. Outlet boxes for exposed inside work in damp locations must be galvanized cast iron or cast aluminum with threaded hubs and neoprene gaskets.

10. Junction boxes must not be less than 4 11/16" square and must be equipped with zinc coated plates. Where plates are exposed, they must be finished to match the room decor.

11. FIXTURE SUPPORTS: Outlet boxes supporting lighting fixtures must be equipped with fixture studs held by approved galvanized stove bolts or integral with the box. Cast iron or malleable boxes must have four (4) tapped holes for mounting required cover or fixtures.

12. Outlet boxes exposed to the weather or indicated W.P. must be cast iron or cast aluminum with the covers made watertight with neoprene gaskets. The boxes must have external lugs for mounting. Drilling of the body of the fitting for mounting will not be permitted. The cover screws must be appropriate in size, non-corrodible and not less than four (4) in number for each box opening.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 ELECTRICAL WIRING DEVICES:

A. WALL SWITCHES: must be of the best specification grade, quiet type, and must have a rating of 20 Amperes at 277 volts, as manufactured by Bryant, Hubbell or approved equal. The mechanism must be equipped with arc snuffers. They must be of the tumbler type, single pole. Switches of the 3-way type must have a similar rating.

B. RECEPTACLES:

1. CONVENIENCE OUTLETS: must be of the best specification grade, duplex, two-pole, 3-wire, 20 Amperes at 125 volts. It must have a grounding pole that must be grounded to the conduit system. Receptacles must be capable of both back and side wiring and must have only one (1) grounding screw. Receptacles must be Hubbell Catalog #5262 or approved equal.

2. HEAVY DUTY RECEPTACLE OUTLETS: must have the Ampere rating and the number of poles specified on the Contract Drawings and must be Hubbell, Russell-Stoll, Bryant, AH & H or approved equal. Each outlet must have a grounding pole, which must be grounded to the conduit system.

3. FLOOR RECEPTACLES: must be Russell & Stoll #3040 or approved equal, to fit into floor box previously specified.

4. NAMEPLATES: are required for all receptacles other than 120V.

C. CLOCK HANGERS: Clock outlets for surface type clocks must be equipped with a supporting hook and recessed faceplate to conceal the electrical cord.

D. WATERTIGHT DEVICES: For installations exposed to weather or in damp locations, the devices must be in a gasketed, cast iron enclosure.

E. PLATES:

1. Every convenience outlet and switch outlet must be covered by means of a stainless steel No. 302 - 0.4" antimagnetic plate with an approved finish, unless provided otherwise in the detailed Specifications.

2. Where two (2) or three (3) switches are grouped together, a single faceplate must be used. Where more than three (3) switches are located at one (1) point, the faceplates may be made up in multiple units.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4

3.4 ELECTRICAL CONDUCTORS AND TERMINATIONS:

A. CONDUCTORS FOR LIGHT AND POWER: All wire and cable must be of annealed copper of 98% conductivity. Aluminum wire or cable will not be permitted. The insulation must be flame retardant, moisture and heat resistant, thermoplastic, type THW or THWN rated for 600 volts at 75 degrees Celsius (C.) for both wet and dry locations. Wires No. 8 or larger must be stranded. Wires and cables must also

be subject to the requirements of the NYCEC. Cables for incoming service, or wire in conduits contiguous with the earth, in concrete, or other damp or wet locations, must be synthetic rubber insulated with neoprene jacket, heat and moisture resistant and must be equal to UL Type USE and rated for 600 volts at 75 degrees C. for both wet and dry locations.

B. FIXTURE WIRE: Lighting fixtures must be wired with No. 14 gauge wire designated as AWM and rated at 105 degrees C.

C. OTHER TYPES: Cables and wires for interior communication systems are described in applicable detailed Specifications.

D. MINIMUM SIZE: Conductors smaller than No. 12 AWG must not be used for light or power.

E. COLOR CODE: Wires must have a phase color code, and multiple conductor cables must be color coded.

F. CABLE DATA: The Contractor must submit for approval the following information for each size and type of cable to be furnished:

1. Manufacture of Cable - Location of Plant.
2. Minimum insulation resistance at standard test temperature.
3. Days required for delivery to site of work after order to proceed with manufacture.

G. ORIGINAL REELS: Cable and wire must be delivered to the site of the work on original sealed factory reels.

H. WIRE INSTALLATION:

1. INSTALL WIRES AFTER PLASTERING: Feeder and branch circuits wiring must not be installed into conduit before the rough plastering work is completed. No conductors must be pulled into floor conduits before floor is poured.
2. CONDUIT SECURED IN PLACE: No conductor must be pulled into any conduit run before all joints are made up tightly and the entire run rigidly secured in place.
3. WIRE ENDS: All wires must be left with sufficiently long ends for proper connection and stowing.
4. PULLING COMPOUNDS: to ease the pulling-in of wires into the conduit, only approved compounds as recommended by cable manufacturers must be used.
5. PRESSURE CONNECTORS: pressure connectors for wires must be of the cast copper or forged copper pressure plate type. Connectors must be O.Z., Burndy, National Electric Products or approved equal.
6. Splices and feeder taps in the gutters of panel boxes must be made by means of pressure plate-type connectors encased in composition covers as manufactured by O.Z., Burndy, National Electric Products or approved equal.
7. Splices in branch wiring for sound systems and fire systems, must be first made mechanically secure, then soldered and taped.
8. In lieu of soldered splices (except for sound and fire systems, which must have soldered splices) the following alternates are acceptable for operating temperatures up to 105 degrees C., for fluorescent fixtures and for the splicing of branch circuit wiring up to No. 8 AWG wire:
    a. Mechanical splices made with mechanical connectors as manufactured by the Minnesota Manufacturing Company "Scotchlock" or approved equal. Mechanical connectors requiring a special tool (pressure connectors, insulators and locking rings) by Buchanan or approved equal. The tool used for connector application must be as approved by the connector manufacturer.

b. For branch circuit wire and cable No. 6 AWG and larger, the seamless tubular connector will only be accepted. Application of this connector must be with a tool recommended by the connector manufacturer.

9. TAGS: All feeders and risers must be tagged at both ends, and in all pull and junction boxes and gutter spaces through which they pass. Such tags must be of fiber and have the feeder designation and size stamped thereon.

10. BRANCH CIRCUIT WIRING:

a. The Contractor installing branch circuit wiring must test the work for correct connections and leave all loop splices in the fixture outlet boxes properly spliced and taped. The Contractor must provide wire ends long enough for convenient connection to device.

b. NEUTRALS: No common neutrals must be used except for lighting branch circuits. Each neutral wire must be terminated separately on a neutral busbar in the panelboard. No common neutrals will be permitted for convenience receptacle branch circuits.

I. TERMINATIONS

1. LUGS: All lugs for all devices and all cable terminations must be copper. AL/CU rated lugs will not be permitted. The only exception to this requirement is when the particular device is not manufactured with copper lugs by any manufacturer. Lugs for No. 6 AWG cable and larger must be cast copper or forged copper pressure plate type. Lugs for 1/0 and larger must be fastened with two (2) bolts.

2. All lugs must be of the proper size to accept the cable connected to them. Any Subcontractor furnishing a device containing lugs is to coordinate with the Contractor to ensure that the device terminations are adequate for the wire or cable (whose size may be larger than expected due to voltage drop considerations) connected to the device.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.5

3.5 CIRCUIT PROTECTIVE DEVICES:

This Section sets forth the circuit protective devices such as circuit breakers and safety switches, used in connection with Motor Control Equipment, Distribution Centers, Panel boards and Service Entrance.

A. CIRCUIT BREAKERS:

1. CIRCUIT BREAKERS: must be operable in any position and must be of the quick-make, quick-break type on manual operation. The handle must be trip free, preventing contacts from being held in closed position against abnormal overloads or short circuits. Positive visual indication of automatic tripped position of breaker must be provided, in addition to the "On" and "Off" indication. All circuit breakers must be of the bolted type.

2. TRIP RATING: Circuit breakers must be provided with the required number of trip elements, calibrated at 40 degrees C., ambient temperature, in accordance with wire sizes or motor currents as shown on Contract Drawings or indicated in the Specifications.

3. POLE BARRIER: Multipole pole breakers must be designed to break all poles simultaneously. They must be provided with barriers between poles and arc suppressing devices.

4. ELEMENTS: Multipole circuit breakers must have frames of not less than a 100 Ampere rating. Multipole circuit breakers for 480 volts AC operation must have an NEMA interrupting rating of 18,000 Amperes, unless a higher rating is specified in the Specifications or indicated on the Contract Drawings.

5. For circuit breakers with frame size up to and including 225 Amperes, the breakers may be

provided with non-interchangeable trip elements. For frame ratings above 225 Amperes, the breakers must be provided with interchangeable trip elements, which can be replaced readily.

6. Single pole circuit breakers for branch circuits must have a frame size of no less than 100 Amperes and must be rated at 125 volt A.C. with a NEMA interrupting rating of 10,000 Amperes, unless a higher rating is specified in the Specifications or indicated on the Contract Drawings.

7. INVERSE TIME ACTION: The circuit breakers must be dual element type, one (1) element with time limit characteristics, so that tripping will be prevented on momentary overloads, but will occur before dangerous values are reached and the other with instantaneous trip action. Inverse time delay action must be effective between a minimum tripping point of 125% of rating of breaker and an instantaneous tripping point between 600% and 700% of rated current.

8. CONSTANCY OF CALIBRATION: The tripping elements must ensure constant calibration and be capable of withstanding excessive short circuit conditions without injury.

9. CONTACTS: must be non-welding under operating conditions and of the silver to silver type.

10. TEMPERATURE RISE: Current carrying parts, except thermal elements, must not rise in temperature in excess of 30 degrees C. while carrying current at the part's rated current and frequency.

11. NUMBERING: Each circuit breaker must be distinctly numbered when installed in a group with other breakers. The calibration of trip element must be indicated on each breaker.

B. SAFETY SWITCHES:

NEMA TYPE HD: When safety switches are permitted to be used for service entrance, motor disconnecting means or to control other types of electrical equipment, they must be of the type HD of a rating not less than 30 Amperes. Enclosures must be provided with means for locking. For ratings above 60 Amperes terminals must have double studs.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.6

3.6 DISTRIBUTION CENTERS:

This Section sets forth the construction and installation procedure for Switchboards, Panel boards and Cabinets.

A. PANEL BOARDS, GENERAL TYPE: The panel boards must be of the automatic circuit breaker type with individual breakers for each circuit, removable without disturbing the other units. Circuit breakers must be in accordance with the requirements outlined under Section 3.5, "Circuit Protective Devices."

B. NUMBER AND RATING OF CIRCUIT BREAKERS: The Contract Drawings show a layout of each panel, giving the number, frame, size and trip setting of circuit breakers and number of branch circuits and spare breakers. Each branch circuit must be distinctly numbered.

C. BUS BAR CONSTRUCTION AND SUPPORT: Panel Boards must be of the dead front type and must have bus bars and branch circuits designed to suit the system and voltage. Current carrying parts, exclusive of circuit breakers, must be copper and based on a maximum density of 1,000 Amperes per square inch. Bus bars for the main switchboard must be designed for the frame rating of the Service Breaker. Bus bars must run up the center of the panel, unless otherwise indicated, and must have connected thereto the various branch circuits. Unless otherwise specified, bus bars for each panel board must be equipped with main lugs only and capacity as required on Contract Drawings. Where main protection is required, automatic circuit breakers must be used. A neutral bus of at least the same capacity as a live bus bar must be provided for the connection of all neutral conductors. Each terminal must be identified. All current carrying parts, exclusive of circuit breakers, must be of copper with a minimum number of joints. The bus bar structure must be a self-supporting unit, firmly fastened to a ½

inch plastic board, extending the full length and width of assembly which must serve to insulate the bus structure from the back of panel box. Other methods affording equally effective bus structure support and insulation will be given consideration. An insulating barrier must separate neutral bus from other parts of panel.

D. CIRCUIT BREAKER ASSEMBLY: The entire circuit breaker and bus bar assembly must be mounted on an adjustable metal base or pan and secured to the back of the panel box. The panel must have edges flanged for rigidity.

E. PANEL MOUNTING: The panel must be centered in the panel box, line up with the door openings, be set level and plumb, and no live parts may be exposed with the door open.

F. PANEL CABINET:

1. PANEL CABINET INSTALLATION: When installed, surface mounted in panel closets must be mounted on Kindorf channel.

2. Where cabinets cannot be set entirely flush due to mustow walls or partitions or where cabinet is extra deep, the protruding sides of cabinet must be trimmed with a metal or hardwood return molding of approved design and fastened to cabinet so as to conceal the intersection between the wall and cabinet.

G. NAMEPLATES: Where required, nameplates must be made of engraved Lamicoid sheet, or approved equal. Letters and numbers must be engraved white on a black background (except for Firehouse projects which must have white letters on a red background). The Contractor must submit an engraved sample for approval as to design and style of lettering before proceeding with the manufacture of the nameplate. Nameplates must be of suitable size and must also be provided at the top of the switchboard or section thereof and on the trim at the top of all lighting and power panels. Similar nameplates must also be provided for each distribution circuit breaker giving the breaker number, the number of the feeder, and the name of the equipment fed.

H. SHOP DRAWINGS: showing all details of boxes, panels, etc., must be submitted for approval.

I. DIRECTORIES: A directory must be fastened with brass screws and consist of a noncorrosive metal frame with dimensions not less than five (5) inches x eight (8) inches and a transparent window of Plasticile, Plexiglass, Lucite, Polycarbonate or approved equal that is not less than 1/16 inch thick over cardboard or heavy paper. The directory must be typewritten and show the number and name of each circuit, and lighting or equipment supplied. The size of riser feeder must be as indicated on the directory. The dimensions of the directory must be submitted for approval for each size of panel.

J. CONSTRUCTION

1. FINISH: Panel boxes, doors and trim for installation in dry locations, must be zinc coated after fabrication by the hot-dip galvanizing or electroplate process on inside and outside surfaces. In damp locations, panel boards must be enclosed and gasketed NEMA 3R type. Panel boards located outdoors or exposed to the weather must be NEMA 3X type.

2. PAINTING: Panel boxes, doors and trim must receive a coat of approved priming paint and a second coat of approved paint in the field after installation. Paint must be applied to the inside and outside of boxes and on both sides of trim. Panel trims and doors must receive a third or finishing coat on the outside after installation. Approval as to texture and color must be obtained before the final coat is applied.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.7

3.7 MOTORS:

This Section sets forth the general design, construction and performance requirements, which must apply to all motors furnished in the Contract.

A. MOTOR DESIGN: All motors must be designed to comply with the New York State Energy Conservation Construction Code and the New York City Energy Conservation Code. In the event of any conflict or inconsistency between such codes, the New York City Energy Conservation Code must prevail. Motors must have standard NEMA frames and must have nameplate ratings adequate to meet the specified conditions of operation. Motor performance under variable conditions of voltage and frequency must be within the limits set in NEMA standards, unless modified in the Specifications. Motors must be expressly designed for the hazard duty load, voltage and frequency as specified in the Contract. All motor windings must be copper. All motors intended to operate on a 208 volt system must be designed and rated for 200 volts.

B. STANDARDS OF COMPARISON: In the absence of specific motor specifications, in general, the best standard products of the leading motor manufacturers must be considered as a standard for comparison. The requirements of the NEMA standards for motors and generators must be deemed to contain the minimum requirements of performance and design.

C. OBJECTIONABLE NOISES: Objectionable noises will not be tolerated and exceptionally quiet motors may be required for certain specified locations. Noise control tests as per the New York City Construction Codes may be performed as directed by the Commissioner. Such motors must bear a nameplate lettered "Quiet Motor." Springs and slip rings must be of approved non-ferrous material.

D. BEARINGS:

1. Bearings, unless specified otherwise, must be of the ball or roller type. Motors one (1) horsepower and larger that are equipped with ball roller bearings must also have lubrication of the pressure-relief greasing type. The Contractor furnishing four (4) or more such motors must also furnish, as part of the Contract, a pressure grease gun of rugged design, of approximately ten (10) ounce capacity, complete with necessary adapters. The Contractor must also provide ten (10) pounds of approved gun grease.

2. For any particular unit where sleeve bearings are deemed desirable, permission for their use may be granted by the Commissioner. Motors one (1) horsepower and larger that are equipped with sleeve type bearings must, in addition to having protected fittings easily accessed for oiling, be provided with visible means for determining normal oil level. Lubrication must be positive, automatic and continuous.

E. MOTOR TERMINALS AND BOXES: Each motor must be furnished with flexible leads of sufficient length to extend for a distance of not less than three (3) inches beyond the face of the conduit terminal box. This box must be furnished of ample size to make and house motor connections. These requirements must be met irrespective of any other standards or practices. Size of cable terminals and conduit terminal box holes must be subject to approval. For motors five (5) horsepower or larger, each terminal must come with two (2) cast or forged copper pressure type connectors with bolts, nuts and washers. For motors of smaller ratings, connectors of other acceptable types may be furnished. For installations exposed to the weather or moist locations, terminal boxes must be of cast iron with threaded hubs and gasketed covers. Cover screws must be of non-corrosive material.

F. MOTOR TEMPERATURE RISES: The motor nameplate temperature rises for the various types of motor enclosures must be as listed below:

1.	Open Frame	40 degrees C.
2.	Totally enclosed and enclosed fan cooled	55 degrees C.
3.	Explosion proof and submersible	55 degrees C.

4. Partially enclosed and drip proof 40 degrees C.

The temperature of the various parts of a motor must meet the requirements of NEMA standards for the size and type of the motors. Tests for heating must be made by loading the motor to its rated horsepower and keeping it so loaded for the rated time interval or until the temperature becomes constant.

G. SPECIAL CODE INSTALLATIONS: Electrical installations covered by special publications of NBFU and by special City rulings and regulations must comply in design and safety features with such applicable codes, regulations and rulings, and must be furnished and installed complete with all accessories and safety devices as therein specified.

H. MOTORS ON LIGHTING PANELS: The largest A.C. motor permitted on branch circuits of lighting panels must not exceed 1/4 horsepower.

I. MOTORS RATED: ½ horsepower and larger must be polyphase.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8

3.8 MOTOR CONTROL EQUIPMENT:

This Section sets forth the requirements for motor controllers and associated devices. Such requirements are applicable to all motor control equipment furnished or installed.

A. MANUFACTURER: All control equipment furnished under the Contract must be the product of a single manufacturer. Exceptions to this rule may be granted in the case of controllers for fractional horsepower motors driving special equipment, the various units of which have been engineered to obtain specific performance.

B. CONTROL ITEMS REQUIRED: The Contractor furnishing motors must also furnish therewith complete disconnecting, starting and control equipment as required by the detailed Specifications, the various code authorities and for the successful operation of the driven equipment. These items include circuit breakers, magnetic starters with overload protection and low voltage release or protection, push button stations, pilot lights and alarms, float, pressure, temperature and limit switches, load transfer switches, devices for manual operation and speed controllers, etc. The Contractor must furnish as many of these items as required for the successful operation of the driven unit.

1. Where a motor is to be located out of sight of the controller, the Contractor must furnish an approved disconnecting means to be mounted near motor.

C. TYPES OF STARTERS:

1. SQUIRREL CAGE: A.C. motors of the squirrel cage type, rated from one (1) to thirty (30) horsepower, must have magnetic across the line starters; motors rated above thirty (30) horsepower must be furnished with reduced voltage (autotransformer type) starter or part winding start with time delay to reduce inrush current. Size of starters must be based on 200V operation.

2. SLIP RING: A.C. motors of the slip-ring type must be furnished with primary across the line starters interlocked with secondary starting and regulating equipment. The interlocking feature must prevent starting of the motor when the secondary controller is off the initial starting point.

3. MAGNETIC: For fractional horsepower motors, magnetic type starters are not required unless the particular method of controlling the driven equipment makes them necessary. Where individual single phase fractional horsepower motors or the sum of fractional horsepower motors controlled by an automatic device are ½ horsepower or more, magnetic starters and circuit breakers must be used. Single phase A.C. motors smaller than ½ horsepower or three-phase A.C. motors smaller than one (1) horsepower where manual control is specified may be furnished with starters of toggle switch or push button type with inbuilt thermal protection. No additional disconnecting means is required to be furnished with this type of starter. This type of starter may also be used in series

with automatic control devices such as thermostats, float and pressure switches, provided the individual motor or the sum of fractional horsepower motors is less than ½ horsepower. Means for manual operation must be provided.

D. DISCONNECTING BREAKER: All motor starters, unless otherwise specified, must be provided with a disconnecting means in the form of a circuit breaker of the type specified under Article 3.5 CIRCUIT PROTECTIVE DEVICES. This disconnecting means must be contained in the same housing with the starter and must be operable from outside. Means must be provided for locking the handle of the circuit breaker in the "OFF" position if it is desired to take the equipment out of service and prevent unauthorized starting.

E. CONTROL CABINET – DRY LOCATIONS: All starters must be furnished with general purpose, NEMA Type 1, sheet metal enclosures with hinged covers and baked enamel finish.

F. CONTROL CABINET – WATERTIGHT: In wet locations, cast iron watertight enclosures with threaded hubs, galvanized and gasketed hinged covers must be provided.

G. PANELS: Motor control devices and appliances must be mounted on approved insulating slabs with all wiring and connections made on the back of the slabs.

H. WIRING AND TERMINALS: Wiring connections for currents of one hundred (100) Amperes or less may be made with copper wire or cable with special flameproof insulating coverings. Such wires must be installed in a neat workmanlike manner, flat against the slab, and held in place by clips. Connections must be made with pressure connectors for No. 8 AWG and larger wires, and with grommets for small, stranded wires. Except for incoming and outgoing main leads, all connections must terminate on approved connector blocks, which may be installed on the face of the slab. For small, across the line starters, the above requirements may be modified if satisfactory connections are provided.

I. COPPER BUS: For currents exceeding one hundred (100) Amperes, copper bus must be used in place of wires. The bus must be constructed of copper rods, tubing or flat strap, bent and shaped properly and securely attached to the slab in a neat and workmanlike manner. The cross section of copper must provide sufficient areas to keep current density at not more than one thousand (1,000) Amperes per square inch.

J. COOPERATION: The Contractor’s Subcontractor(s) who furnish electrically operated equipment must give to the Contractor and the Contractor’s electrical Subcontractor full information relative to sizes and locations of apparatus furnished by them which require electrical connections.

END OF SECTION 01 35 06

SECTION 01 35 26
SAFETY REQUIREMENTS PROCEDURES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. The Contractor shall comply with the requirements of "*The City of New York Department of Design and Construction Safety Requirements".* This document is included in the Information for Bidders.

1.2 SUMMARY:

A. This Section includes administrative and general procedural requirements for Safety and Health Requirements, including:

1. Definitions
2. Required Safety Meeting
3. Compliance with Regulations
4. Submittals
5. Personnel Protective Equipment
6. Hazardous and / or Contaminated Materials
7. Emergency Suspension of Work
8. Protection of Personnel
9. Environmental Protection

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 REQUIRED SAFETY MEETINGS:

A. Prior to commencing construction, the Resident Engineer will schedule and hold a preconstruction kick-off meeting either at DDC's main office or at the Project site with representatives of the Contractor, including the principal on-site project representative, one or more safety representatives, the Commissioner's designated representatives and other concerned parties for the purpose of reviewing the Contract safety requirements. Additionally, implementing Work safety provisions must be discussed.

B. The Contractor is responsible for conducting weekly documented jobsite safety meetings, given to all jobsite personnel including all Subcontractors on the Project, with the purpose of discussing safety topics and job-specific requirements at the DDC worksite.

1.5 COMPLIANCE WITH REGULATIONS:

A. The Work, including contact with or handling of hazardous materials, disturbance or dismantling of structures containing hazardous materials, and disposal of hazardous materials, shall comply with the applicable requirement for 29 CFR Parts 1910 and 1926, and 40 CFR, Parts 61, 261, 761 and 763.

B. Work involving disturbance or dismantling of asbestos or asbestos-containing materials, demolition of structures containing asbestos and removal of asbestos, shall comply with 40 CFR Part 61, Subparts A and M, and 40 CFR Part 763, as applicable.

C. Additionally, Work shall comply with all applicable federal, state, and local safety and health regulations.

D. In case of a conflict between applicable regulations, the more stringent requirements shall apply.

E. All workers working on the DDC Project site are required by NYC Local Law 41 to complete the OSHA 10-hour training course.

1.6 SUBMITTALS:

A. The Contractor shall submit to the Resident Engineer, copies of the Safety Program, Site Safety Plan and other required documentation in accordance with the "*New York City Department of Design and Construction Safety Requirements*".

B. Permits: If hazardous materials are disposed of off-site, the Contractor must submit to the Resident Engineer copies of shipping manifests, permits from applicable federal, state, or local authorities and disposal facilities, and certificates that the material has been disposed of in accordance with regulations.

C. Accident Reporting: Submit a copy of each accident report to the Resident Engineer in accordance with the "*New York City Department of Design and Construction Safety Requirements*".

D. All asbestos and lead project regulatory notifications are to be submitted to DDC's Office of Environmental and HazMat Services (OEHS) through the Resident Engineer.

E. Request for Subcontractor Approval: Any Subcontractor performing environmental work must submit required documentation for approval to perform such work as required by DDC's OEHS.

PART II – PRODUCTS

2.1 PERSONNEL PROTECTIVE EQUIPMENT:

A. Special facilities, devices, equipment, and similar items used by the Contractor in execution of the Work shall comply with 29 CFR Part 1910, subpart I, Part 1926, subpart E, and other applicable regulations.

2.2 HAZARDOUS AND / OR CONTAMINATED MATERIALS:

A. The Contractor shall bring to the attention of the Commissioner, any material encountered during execution of the Work that the Contractor suspects to be hazardous and / or contaminated.

B. The Commissioner shall determine whether the Contractor shall perform tests to determine if the material is hazardous and / or contaminated. A change to the Contract price may be provided, subject to the applicable provisions of the Contract.

C. If the material is found to be hazardous, the Commissioner may direct the Contractor to remediate the hazard and a change to the Contract price may be provided, subject to the applicable provisions of the Contract.

PART III – EXECUTION

3.1 EMERGENCY SUSPENSION OF WORK:

A. When the Contractor is notified by the Commissioner of noncompliance with the safety provisions of the Contract, the Contractor shall immediately, unless otherwise instructed, correct the unsafe condition, at no additional cost to the City.

B. If the Contractor fails to comply promptly, all or part of the Work may be stopped by notice from the Commissioner.

C. When, in the opinion of the Commissioner, theContractor has taken satisfactory corrective action, the Commissioner shall provide written notice to the Contractor that the Work may resume.

D. The Contractor shall not be allowed any extension of time or compensation for damages in connection with a work stoppage for an unsafe condition.

3.2 PROTECTION OF PERSONNEL:

A. The Contractor shall take all necessary precautions to prevent injury to the public, occupants, or damage to property of others. The public and occupants includes all persons not employed by the Contractor or a Subcontractor.

B. Whenever practical, the work area shall be fenced, barricaded, or otherwise blocked off from the public or occupants to prevent unauthorized entry into the work area, in compliance with the requirements of Section 01 50 00 TEMPORARY FACILITIES, SERVICES AND CONTROLS, and including without limitation, the following:

1. Provide traffic barricades and traffic control signage where construction activities occur in vehicular areas.
2. Corridors, aisles, stairways, doors, and exit ways shall not be obstructed or used in a manner to encroach upon routes of ingress or egress utilized by the public or occupants, or to present an unsafe condition to the public or occupants.
3. Store, position and use equipment, tools, materials, scraps and trash in a manner that does not present a hazard to the public or occupant by accidental shifting, ignition, or other hazardous activity.
4. Store and transport refuse and debris in a manner to prevent unsafe and unhealthy conditions for the public and occupants. Cover refuse containers and remove refuse on a frequent regular basis acceptable to the Resident Engineer. Use tarpaulins or other means to prevent loose transported materials from dropping from trucks or other vehicles.

3.3 ENVIRONMENTAL PROTECTION:

A. Dispose of solid, liquid and gaseous contaminants in accordance with local codes, laws, ordinances and regulations.

B. Comply with applicable federal, state, and local noise control laws, ordinances, and regulations, including but not limited to 29 CFR 1910.95, 29 CFR 1926.52 and NYC Administrative Code Chapter 28 of Title 15.

END OF SECTION 01 35 26

SECTION 01 35 91
HISTORIC TREATMENT PROCEDURES

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 91

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for the treatment of Landmark Structures and Landmark Quality Structures, as identified in the Addendum. Specific requirements are indicated in other sections of the Specifications.

B. This Section includes, without limitation, the following:

1. Storage and protection of existing historic materials
2. General Protection
3. Protection during use of heat-generating equipment
4. Photographic Documentation
5. NYC Landmarks Preservation Commission Final Approval signoffs

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION
C. Section 01 33 00 SUBMITTAL PROCEDURES
D. Section 01 77 00 CLOSEOUT PROCEDURES
E. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Landmark Structure or Site: Any building or site which has been designated as a landmark, or any building or site within a landmark district, as designated by the New York City (NYC) Preservation Commission or the New York State Historic Preservation Office.

D. Landmark Quality Structure: Any building which has been determined by the City to be of landmark quality and/or historical significance.

E. Preservation: To apply measures necessary to sustain the existing form, integrity, and materials of a historic property. Work may include preliminary measures to protect and stabilize the property.

F. Rehabilitation: To make possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

G. Restoration: To accurately depict the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and the reconstruction of missing features from the restoration period.

H. Reconstruction: To reproduce in the exact form and detail a building, structure, or artifact as it appeared at a specific period in time.

I. Stabilize: To apply measures designed to reestablish a weather-resistant enclosure and the structural reinforcement of an item or portion of the building while maintaining the essential form as it exists at present.

J. Protect and Maintain: To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.

K. Repair: To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Within restoration, repair also includes limited replacement in kind, rehabilitation, and reconstruction, with compatible substitute materials for deteriorated or missing parts of features when there are surviving prototypes.

L. Replace: To duplicate and replace entire features with new material in kind. Replacement includes the following conditions:

1. Duplication: Includes replacing elements damaged beyond repair or missing. Original material is indicated as the pattern for creating new duplicated elements.
2. Replacement with New Materials: Includes replacement with new material when original material is not available as patterns for creating new duplicated elements.
3. Replacement with Substitute Materials: Includes replacement with compatible substitute materials. Substitute materials are not allowed, unless otherwise indicated.

M. Remove: To detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

N. Remove and Salvage: To detach items from existing construction and deliver them to the City ready for reuse.

O. Remove and Reinstall: To detach items from existing construction, repair and clean them for reuse, and reinstall them where indicated.

P. Existing to Remain or Retain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled.

Q. Material in Kind: Material that matches existing materials as much as possible, in species, cut, color, grain, and finish.

1.5 SUBMITTALS:

A. Historic Treatment Program: Submit a written plan for each phase or process, including protection of surrounding materials during operations. Describe in detail materials, methods, and equipment to be used for each phase of the Work.

B. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of the Work, submit for the Commissioner’s approval a written description, including

evidence of successful use on other comparable projects and provide a program of planned testing to demonstrate the effectiveness of the alternative methods and materials for use on this Project.

C. Qualification Data: Submit qualification data for historic treatment specialists as specified and required by individual sections of the Project specifications.

D. Photographs for Designated Landmark Structures: Submit photographs in accordance with Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION and as described in this section.

E. Record Documents: Include modifications to manufacturer's written instructions and procedures, as documented in the historic treatment preconstruction conference and as the Work progresses.

1.6 QUALITY ASSURANCE:

A. Historic Treatment Specialist Qualifications: Refer to Section 01 40 00 QUALITY REQUIREMENTS for Qualifications for Historic Treatment Specialists.

B. Historic Treatment Preconstruction Conference: The Resident Engineer will schedule and hold a preconstruction meeting at the site in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.

1. Review manufacturer's written instructions for precautions and effects of products and procedures on building materials, components, and vegetation.

a. Record procedures established as a result of the review and distribute to affected parties.

1.7 STORAGE AND PROTECTION OF HISTORIC MATERIALS:

A. Removed and Salvaged Historic Materials: As specified and required by individual sections of the Project specifications.

B. Removed and Reinstalled Historic Materials: As specified and required by individual sections of the Project specifications.

C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling during historic treatment. When permitted by the Commissioner, items may be removed to a suitable, protected storage location during historic treatment and reinstalled in their original locations after historic treatment operations are complete.

D. Storage and Protection: When removed from their existing location, store historic materials, at a location acceptable to the Commissioner, within a weather tight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature variations. Secure stored materials to protect from theft.

1. Identify removed items with an inconspicuous mark indicating their original location.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 GENERAL PROTECTION:

A. Comply with manufacturer's written precautions against harmful effects of products and procedures on adjacent building materials, components, and vegetation.

B. Ensure that supervisory personnel are present when work begins and throughout its progress.

C. Temporary Protection of Historic Materials during Construction:

1. Protect existing materials during installation of temporary protections and construction. Do not deface or remove existing materials.

2. Attachments of temporary protection to existing construction must be approved by the Commissioner prior to installation.

D. Protect landscape work adjacent to or within work areas as follows:

1. Provide barriers to protect tree trunks.

2. Bind spreading shrubs.

3. Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than eight (8) hours at a time.

4. Set scaffolding and ladder legs away from plants.

E. Existing Drains: Prior to the start of work or any cleaning operations, test drains and other water removal systems to ensure that drains and systems are functioning properly. Notify the Commissioner immediately of drains or systems that are stopped or blocked. Do not begin Work pertaining to this Section until the drains are in working order.

1. Provide a method to prevent solids, including stone or mortar residue, from entering the drains or drain lines. Clean out drains and drain lines that become blocked or filled by sand or any other solids because of the Work performed under this Contract.

2. Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION DURING USE OF HEAT-GENERATING EQUIPMENT:

A. No roofing work requiring the use of an open flame will be permitted on any Landmark Structure or any Landmark Quality Structure whose roof or wall structure is made of wood or primarily of wood.

B. Comply with the following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used:

1. Obtain Commissioner’s approval for operations involving use of open-flame or welding equipment. Notification must be given for each occurrence and location of work with heat-generating equipment.

2. Where possible, use heat-generating equipment in shop areas or outside the building.

3. Before work with heat-generating equipment commences, furnish personnel to serve as a fire watch (or watches) for location(s) where work is to be performed.

4. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.

5. Remove and keep the area free of combustibles, including rubbish, paper, waste, etc., within the area of operations.

6. If combustible material cannot be removed, provide fireproof blankets to cover such materials.

7. Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks or hot slag into surrounding combustible material.

8. Prevent the extension of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.

9. Inspect each location of the day's work not sooner than thirty (30) minutes after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained.

C. Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to automatic sprinkler heads, shield the individual heads temporarily with guards.

3.3 PHOTOGRAPHIC DOCUMENTATION:

A. Photographs for Designated Landmark Structures: Show existing conditions prior to any historic treatments, including one overall photograph and two close-up photographs of all areas of work affected. Show one overall photograph and two close-up photographs of all areas of work after the successful execution of all historical treatments.

3.4 NEW YORK CITY LANDMARKS PRESERVATION COMMISSION FINAL APPROVALS SIGNOFF:

A. For all projects involving a Landmark Structure or Site, the Contractor, at the completion of the Work, must submit to the Commissioner, in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS, all documentation concerning the successful execution of all historic treatments. This must include, but not be limited to, copies of all before and after photographs of historic treatments, one copy of the GC Contractor's as-built drawings, copies of testing and analysis results, including cleaning, mortar analysis, pointing mortars and all other information pertaining to work performed under the NYC Landmarks Preservation Commission jurisdiction.

END OF SECTION 01 35 91

SECTION 01 40 00
QUALITY REQUIREMENTS

PART I - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes the following:

1. Definitions
2. Engineering Services
3. Conflicting Requirements
4. Quality Assurance
5. Quality Control
6. Approval of Materials
7. Special Inspections (Controlled Inspection)
8. Inspections by Other City Agencies
9. Certificates of Approval
10. Acceptance Tests
11. Repair and Protection

B. This section includes administrative and procedural requirements for quality control to assure compliance with quality requirements specified in the Contract Documents.

C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Documents.

D. Specified tests, inspections, and related actions do not limit Contractor's other quality assurance and quality control procedures that facilitate compliance with the Contract Documents.

E. Provisions of this section do not limit requirements for the Contractor to provide quality assurance and quality control services required by the Commissioner or authorities having jurisdiction.

F. Specific test and inspection requirements are specified in the individual sections of the Specifications.

G. LEED: Refer to the Addendum to identify whether the Project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

H. COMMISSIONING: Refer to the Addendum to identify whether the Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS and/ or Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE. The Contractor must cooperate with the Commissioning Agent and provide whatever assistance is required.

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY

B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION

C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION

D. Section 01 33 00 SUBMITTAL PROCEDURES

E. Section 01 77 00 CLOSEOUT PROCEDURES

F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (Drawings and Specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Commissioning: A Total Quality Assurance process that includes checking the design and installation of equipment, as well as performing functional testing of the same to confirm that the installed equipment is operating and in conformance with the Contract Documents and the City's requirements.

D. Experienced: When used with an entity or individual, "experienced," means having minimum experience levels as described in Article 1.7, Paragraph B "Minimum Experience qualification levels."

E. Installer/ Applicator/ Erector: Contractor or another entity engaged by Contractor as an employee or Subcontractor, to perform a particular construction operation, installation, erection, application, assembly and similar operations.

F. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under sample Submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

G. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

H. Product Tests: Tests and inspections that are performed by a Nationally Recognized Testing Laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

I. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.

J. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory means the same as testing agency.

K. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

L. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements.

1.5 ENGINEERING SERVICES

A. Performance and Design Criteria: Where professional design services provided by a professional engineer are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for clarification to the Commissioner.

1.6 CONFLICTING REQUIREMENTS:

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, the Contractor must comply with the most stringent requirement. The Contractor must refer any uncertainties and/or conflicting requirements to the Commissioner for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified must be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. The Contractor must refer any uncertainties to the Commissioner for a decision before proceeding.

1.7 QUALITY ASSURANCE:

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required. Individual Specification Sections may specify supplementary qualification requirements.

1. **Minimum Experience**: Minimum Experience qualification levels as described herein, apply to all entities indicated in the Specification Sections for the Project, unless such entity requires Special Experience requirements per Subsection 1.7 A.2. below. Individual Specification Sections may specify supplementary qualification requirements.

2. **Special Experience**: Special Experience qualification levels as described herein, apply to all entities indicated in the "Special Experience Requirements" page of the PASSPort procurement. Individual Specification Sections may specify supplementary qualification requirements.

B. **Minimum Experience qualification levels:**

1. **Qualifications for Installer or Applicator or Erector**: An entity complying with the requirements of authorities having jurisdiction and having, prior to the bid opening, been regularly engaged for a minimum of three (3) consecutive years in installing, erecting, applying, or assembling work in a timely fashion similar in material, design, and extent to that indicated for the Project, and whose

work has resulted in construction with a record of successful in-service performance

2. **Qualifications for Installer or Applicator or Erector requiring approval or certification or authorization by Manufacturer**: An entity complying with the requirements of authorities having jurisdiction and having, prior to the bid opening, been regularly engaged for a minimum of three (3) consecutive years in installing, erecting, applying, or assembling work in a timely fashion similar in material, design, and extent to that indicated for the Project, and whose work has resulted in construction with a record of successful in-service performance. In addition, the entity must be approved, or certified, or authorized by the manufacturers listed in the Specification Section and must be eligible to receive manufacturers' warranty.

3. **Qualifications for Fabricator**: An entity complying with the requirements of authorities having jurisdiction; having, prior to the bid opening, been regularly engaged for a minimum of three (3) consecutive years in producing products similar to those indicated for the Project and having a record of successful in-service performance, as well as sufficient production capacity to produce required units.

4. **Qualifications for Manufacturer**: An entity complying with the requirements of authorities having jurisdiction; having, prior to the bid opening, been regularly engaged for a minimum of three (3) consecutive years in manufacturing products or systems similar to those indicated for the Project; having a record of successful in-service performance for not less than three (3) consecutive years and having sufficient production capacity to produce required units. Manufacturer must meet warranty requirements and technical or factory-authorized service representative requirements.

5. **Qualifications for Specialist:** An entity complying with the requirements of authorities having jurisdiction; satisfying qualification requirements indicated in the Specification Section and having, prior to the bid opening, a minimum of three (3) consecutive years successfully engaged in the activities indicated.

C. **Special Experience Qualification Levels:**

1. **Special Qualifications for Installer or Applicator or Erector**: An entity complying with the requirements of authorities having jurisdiction and having, prior to the bid opening, been regularly engaged for a minimum of five (5) consecutive years in successfully installing, erecting, applying, or assembling work similar in material and design to that indicated for the Project. Entity must provide documentation of having successfully completed a minimum of three (3) projects similar in scope, size and type as required for the Project.

2. **Special Qualifications for Fabricator**: An entity complying with the requirements of authorities having jurisdiction; having, prior to the bid opening, been regularly engaged for a minimum of five (5) consecutive years in producing products similar to those indicated for the Project; having a record of successful in-service performance, as well as sufficient production capacity to produce required units. Entity must provide documentation of having successfully completed a minimum of three (3) projects similar in nature, size, and extent, to the requirements of the project.

3. **Special Qualifications for Installer of a Manufacturer-Warrantied Roof System:** An entity complying with the requirements of authorities having jurisdiction; regularly engaged in performing roofing projects with its own workforce; having successfully completed in a timely fashion within the last three (3) consecutive years prior to the bid opening, at least three (3) roofing projects similar in scope, size and type to the required Project, and having performed at least one (1) of those projects in the last twelve (12) months. The three (3) qualifying projects must have utilized one or more of the roofing systems specified for the project being bid herein,

been installed by the entity utilizing its own workforce and must have qualified for, and have been issued, the warranty provided by the manufacturer of the roofing system. In addition, the entity must be a certified or authorized installer for the manufacturer's roofing systems specified herein and must submit proof of same.

4. **Special Qualifications for Installer of Roof tie-in to maintain existing Roof System Warranty:** An entity complying with the requirements of authorities having jurisdiction; regularly engaged in performing roofing projects with its own workforce; having successfully completed in a timely fashion within the last three (3) consecutive years prior to the bid opening, at least three (3) roofing projects similar in scope, size and type to the required Project, and having performed at least one (1) of those projects in the last twelve (12) months. The three (3) qualifying projects must have utilized the manufacturer and manufacturer's Product, been installed by the entity utilizing its own workforce and must have qualified for, and have been issued, the warranty provided by the manufacturer listed in the technical specification. In addition, the entity must be a certified or authorized installer for this manufacturer's specified roofing system specified herein and must submit proof of same.

5. **Special Qualifications for Manufacturer:** An entity complying with the requirements of authorities having jurisdiction; having, prior to the bid opening, been regularly engaged for a minimum of five (5) consecutive years in manufacturing products or systems similar to those indicated for the Project; having completed a minimum of three (3) projects similar in nature, size, and extent, to the requirements of the project; having a record of successful in-service performance, as well as sufficient production capacity to produce required units. Manufacturer must meet warranty requirements, and technical or factory-authorized service representative requirements.

6. **Special Qualifications for Historic Treatment Specialist:** An entity complying with the requirements of authorities having jurisdiction and having prior to the bid opening, been regularly engaged for a minimum of five (5) consecutive years in successfully completing in a timely fashion project similar in scope, size, and type to the required work, based on architectural style, construction method and materials and age of building for the project. Entity must provide documentation of having successfully completed a minimum of three (3) projects similar in scope, size and type as required for the Project, and where at least one (1) such prior project of the three (3) must have involved a landmarked building, as officially designated by the City, State, or Federal government.

D. Professional Engineer Qualifications: A professional engineer who is licensed and registered to practice in the State of New York and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for the Project in material, design, and extent.

E. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for the Project.

F. Testing Agency Qualifications: A Nationally Recognized Testing Laboratory (NRTL), a National Voluntary Laboratory Accreditation Program (NVLAP), or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E329 (Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection); and with additional qualifications specified in individual Specification Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

G. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

   a. Provide test specimens representative of proposed products and construction.
   b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
   c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
   d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
   e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
   f. When testing is complete, remove test specimens and test assemblies, and mockups, and laboratory mockups; do not reuse products on Project.

2. Testing Agency Responsibility: Submit a certified written report of each test, inspection, and similar quality-assurance service to Commissioner, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

H. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by the Commissioner.
2. Notify Commissioner seven (7) days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Commissioner's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise directed or indicated.

I. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings or as indicated on Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials. Comply with requirements in "Mockups" Paragraph in this Section.

J. Room Mockups: Construct room mockups according to approved Shop Drawings or as indicated on Drawings, incorporating required materials and assemblies, finished according to requirements. Provide required lighting and additional lighting where required to enable Commissioner to evaluate quality of the Work. Comply with requirements in "Mockups" Paragraph in this Section.

K. Laboratory Mockups: Comply with the requirements of preconstruction testing and those specified in individual Specification Sections.

1.8 QUALITY CONTROL:

A. City's Responsibilities: Where quality-control services are indicated as the City's responsibility in the Specifications, the City will engage a qualified testing agency to perform these services. (Refer to Special Inspections Article 1.10.)

1. COST OF TESTS BORNE BY THE CITY: Where the City directs tests to be performed to determine compliance with the Specifications regarding materials or equipment, and where such compliance is ascertained as a result thereof, the City will bear the cost of such tests.
2. The City will furnish the Contractor with names, addresses, and telephone numbers of testing entities engaged and a description of the types of testing and inspecting they are engaged to perform.

3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to the Contractor.

B. Contractor's Responsibility: Tests and inspections not explicitly assigned to the City are the Contractor's responsibility. Unless otherwise indicated, the Contractor must provide quality control services as set forth in the Specifications and those required by authorities having jurisdiction, whether specified or not.

1. COST OF TESTS BORNE BY CONTRACTOR - In the case of tests which are specifically called for in the Specifications to be provided by the Contractor or tests which are required by any authority having jurisdiction, but are not indicated as the responsibility of the City, the cost thereof will be borne by the Contractor and will be deemed to be included in the Contract price. The Contractor must reimburse the City for expenditures incurred in providing tests on materials and equipment submitted by the Contractor as the equivalent of that specifically named in the Specifications and rejected for non-compliance.
2. Where services are indicated as Contractor's responsibility, the Contractor must engage a qualified testing agency to perform these quality-control services. Any testing agency engaged by the Contractor to perform quality control services is subject to prior approval by the Commissioner.
3. The Contractor must not employ same entity engaged by the City, unless agreed to in writing by the Commissioner.
4. The Contractor must notify testing agencies and the Commissioner at least 72 hours in advance of the date and time for the performance of Work that requires testing or inspecting.
5. Where quality control services are indicated as Contractor's responsibility, the Contractor must submit a certified written report of each quality-control service, in triplicate, to the Commissioner.
6. Testing and inspecting requested by the Contractor and not required by the Contract Documents are Contractor's responsibility.
7. The Contractor must submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, the Contractor must engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Results must be submitted in writing as specified in Section 01 33 00 SUBMITTAL PROCEDURES. Manufacturer's field representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

D. Retesting/Re-inspecting: Regardless of whether the original tests or inspections were the Contractor's responsibility, the Contractor must provide quality control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Commissioner and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Commissioner and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform duties of Contractor.

F. Associated Services: The Contractor must cooperate with entities performing required tests, inspections, and similar quality control services, and must provide reasonable auxiliary services as requested. The

Contractor must notify the testing agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist testing entity in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing entities.
6. Design mix proposed for use for material mixes that require control by the testing entity.
7. Security and protection for samples and for testing and inspecting equipment at the Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality assurance and quality control services with minimal delay and avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

2. Coordinate and cooperate with the Commissioning Authority/Agent as applicable for start-up, inspection and functional testing in the implementation of the Commissioning Plan.

H. Manufacturer's Directions: Where the Specifications provide that the manufacturer's directions are to be used, such printed directions must be submitted to the Commissioner.

I. Inspection of Material: In the event that the Specifications require the Contractor to engage the services of an entity to witness and inspect any material specially manufactured or prepared for use in or part of the permanent construction, such entity will be subject to prior written approval by the Commissioner.

1. NOTICE - The Contractor must give notice in writing to the Commissioner, sufficiently in advance of its intention to commence the manufacture or preparation of materials specially manufactured or prepared for use in or as part of the permanent construction. Such notice must contain a request for inspection, the date of commencement, and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the Commissioner will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials, or the Commissioner will notify the Contractor that the inspection will be made at a point other than the point of manufacture, or the Commissioner will notify the Contractor that inspection will be waived.

J. No Shipping Before Inspection: The Contractor must comply with the foregoing before shipping any material.

K. Certificate of Manufacture: When the Commissioner so requires, the Contractor must furnish to the Commissioner, authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Specifications. These certificates must include copies of the results of physical tests and chemical analyses where necessary, that have been made directly on the product, or on similar products being fabricated by the manufacturer. This may include such approvals as the Bureau of Standards and Appeals (B.S.A.), the Materials and Equipment (M.E.A.) acceptance Index, the Bureau of Electrical Control (B.E.C.), etc.

L. Acceptance: When materials or manufactured products comprise of such quantity that it is not practical to make physical tests or chemical analyses directly on the product furnished, a certificate stating the results of such tests or analyses of similar materials which were concurrently produced may, at the discretion of the Commissioner, be considered as the basis for the acceptance of such material or manufactured product.

M. Testing Compliance: The testing personnel must make the necessary inspections and tests, and the reports thereof must be in such form as will facilitate checking to determine compliance with the Specifications, indicating thereon all analyses and/or test data and interpreted results thereof.

N. Reports: Reports in duplicate must be submitted and authoritative certification thereof must be furnished to the Commissioner as a prerequisite for the acceptance of any material or equipment.

O. Rejections: If, in making any test, it is ascertained by the Commissioner that the material or equipment does not comply with the Specifications, the Contractor will be notified thereof, and will be directed to refrain from delivering said materials or equipment, or to promptly remove it from the site or from the Work and replace it with acceptable material at no additional cost to the City.

P. Furnish Designated Materials: Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Specifications, the Contractor must immediately proceed to furnish the designated material or equipment.

1.9 APPROVAL OF MATERIALS:

A. Local Laws: All materials, appliances and types or methods of construction must be in accordance with the Specifications and must in no event be less than that necessary to conform to the requirements of the New York City (NYC) Construction Codes, Administrative Code and Charter of the City of New York.

B. Approval of Manufacturer: The names of proposed manufacturers, material suppliers, and dealers who are to furnish materials, fixtures, equipment, appliances or other fittings must be submitted to the Commissioner for approval, as early as possible, to afford proper review and analysis. No manufacturer will be approved for any materials to be furnished under the Contract unless it has a plant of ample capacity and have successfully produced similar products. All approvals of materials or equipment that are legally required by the NYC Construction Codes and other governing authorities must be obtained prior to installation.

C. All Materials: Fixtures, fittings, supplies and equipment furnished under the Contract must be new and unused, except as approved by the Commissioner, and of standard first-grade quality and of the best workmanship and design. The City of New York encourages the use of recycled products where practical.

D. INFORMATION TO SUPPLIERS - In asking for prices on materials under any item of the Contract, the Contractor must provide the manufacturer or dealer with such complete information from the Specifications and Contract Drawings as may in any case be necessary, and in every case the Contractor must inform the manufacturer or dealer of all the General Conditions and requirements herein contained.

1.10 SPECIAL INSPECTIONS:

A. SPECIAL INSPECTIONS:

1. Inspection of selected materials, equipment, installation, fabrication, erection, or placement of components and connections made during the progress of the Work to ensure compliance with the Contract Documents and provisions of the NYC Construction Codes, will be made by a Special Inspector. The City of New York will retain the services of the Special Inspector and bear the costs for the performance of Special Inspections in compliance with NYC Construction Codes requirements or as additionally may be called for in the project specifications, except as noted below for Form TR-3: Technical Report for Concrete Design Mix. The Special Inspector will be an entity that is in compliance with the requirements of the NYC Construction Codes. The Contractor must notify the relevant Special Inspector in writing at least 72 hours before the commencement of any Work requiring special inspection.

2. Form TR3: Technical Report Concrete Design Mix: The Contractor will be responsible for, and bear all costs associated with the filing and securing of approvals, if any, for Form TR3: Technical Report Concrete Design Mix, including, but not limited to, engaging the services of a New York City licensed Concrete Testing Lab for the review and approval of concrete design mix, testing, signatures and professional seals, etc., compliant with NYC Department of Buildings requirements, for each concrete design mix.

3. The Contractor must notify the relevant Special Inspector in writing at least 72 hours before the commencement of any Work requiring Special Inspection. The Contractor will be responsible for and bear related costs to assure that all construction or work has suitable access and remains exposed for inspection purposes until the required inspection is completed.

4. Inspections and tests performed under "Special Inspection" will not relieve the Contractor of the responsibility to comply with the Contract Documents, and that there is no warranty given to the Contractor by the City of New York in connection with such inspection and tests or certifications made under "Special Inspections".

5. The Contractor must coordinate with the Commissioner to provide access and schedule the Work for inspection by the Special Inspector.

6. Any fabricators or off-site activities that require Special Inspection paid for by the City of New York must be within the continental United States, Canada, or Mexico, unless approved in writing by the Commissioner. If approval is granted, the Contractor will be responsible for the Special Inspector's travel costs.

1.11 INSPECTIONS BY OTHER CITY AGENCIES:

A. Letter of Completion: Just prior to Substantial Completion of the Project, the Commissioner will file with the Department of Buildings, an application for a Letter of Completion or a Certificate of Occupancy for the structure.

B. Final Inspections: In connection with the above-mentioned application for a Letter of Completion or a Certificate of Occupancy and before certificates of final payments are issued, the Contractor will be required to arrange for all final inspections by the inspection staff of the Department of Buildings, Fire Department, or other Governmental Agencies having jurisdiction, and secure all reports, sign offs, certificates, etc., by such inspection staff or other governmental agencies, in order that a Letter of Completion or Certificate of Occupancy can be issued promptly.

1.12 CERTIFICATES OF APPROVAL:

A. Responsibility: The Contractor will be responsible for and must obtain all final approvals for the Work installed under the Contract in the form of such certificates that are required by all governmental agencies having jurisdiction over the Work of the Contract.

B. Transmittal: All such certificates must be forwarded to the DDC.

1.13 ACCEPTANCE TESTS:

A. Government Agencies: All equipment and appliances furnished and installed under the Contract must conform to the requirements of the Specifications and will in no event be less than that necessary to comply with the minimum requirements of the law and all of the governmental agencies having jurisdiction.

B. Notice of Tests: Whenever the Specifications and/or any governmental agency having jurisdiction requires the acceptance test, the Contractor will give to all concerned, written notice of the time when these tests will be conducted.

C. Energy: The City will furnish all energy, fuel, water, and light required for tests.

D. Labor and Materials: The Contractor must furnish labor and all other material and instruments necessary to conduct the acceptance tests at no additional cost to the City.

E. Certificates: The Final Acceptance by the Commissioner will be contingent upon the Contractor delivering to the Commissioner all necessary certificates evidencing compliance in every respect with the requirements of the regulatory agencies having jurisdiction.

F. Results: If the results of tests and Special Inspections indicate that the material or procedures do not meet requirements as set forth on the Contract Drawings or in the Specifications or are otherwise unsatisfactory, the Contractor must only proceed as directed by the Commissioner. Additional costs resulting from retesting, re-inspecting, replacing of material and/or damage to the Work and any delay caused to the schedule will be borne by the Contractor.

PART II - PRODUCTS (Not Used)

PART III - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, the Contractor must repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

END OF SECTION 01 40 00

SECTION 01 42 00
REFERENCES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 DEFINITIONS:

REFER TO THE ADDENDUM, Article IX, FOR ADDITIONAL DEFINITIONS AND REVISIONS TO THE CONTRACT AND SPECIFICATIONS

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. "APPROVED," ETC. - "Approved," "acceptable," "satisfactory," and words of similar import will mean and intend approved, acceptable, or satisfactory to the Commissioner.

C. Design Consultant: “Design Consultant” means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

D. "DIRECTED," "REQUIRED," ETC.- Wherever reference is made in the Contract to the Work or its performance, the terms "directed," "required," "permitted," "ordered," "designated," "prescribed," "determined," and words of similar import will, unless expressed otherwise, imply the direction, requirements, permission, order, designation or prescription of the Commissioner.

E. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project Site is shown on Drawings.

1.3 CODES, AGENCIES AND REGULATIONS:

A.B.A	Architectural Barriers Act
A.D.A.A.G.	Americans with Disabilities Act (ADA) Accessibility Guidelines
B.G. & E.	Bureau of Gas and Electricity of the City of New York
B.S. A.	New York City Board of Standards and Appeals
DOE	Department of Energy
E.C.C.C.N.Y.S.	Energy Conservation Construction Code of New York State
EPA	Environmental Protection Administration
N.Y.C.C.C.	New York City Construction Codes
N.Y.C.P.C.	New York City Plumbing Code
N.Y.C.B.C.	New York City Building Code
N.Y.C.M.C.	New York City Mechanical Code New York
N.Y.C.F.G.C.	New York City Fuel Gas Code
N.Y.S. D.O.L	New York State Department of Labor
N.Y.C.D.O.B.	New York City Department of Buildings
N.Y.C.D.E.P.	New York City Department of Environmental Protection
N.Y.C.D.O.T.	New York City Department of Transportation
N.Y.C.E.C.	New York City Electrical Code
N.Y.C.E.C.C	New York City Energy Conservation Code
N.Y.C.F.C.	New York City Fire Code
N.Y.S...D.E.C.	New York State Department of Environmental Conservation
O.S.H.A.	Occupational Safety & Health Administration

1.4 INDUSTRY STANDARDS:

A. STANDARD REFERENCES – Unless otherwise specifically indicated in the Contract Documents, whenever reference is made to the furnishing of materials or testing thereof that conforms to the standards of any technical society, organization or body, it must be construed to mean the latest standard, code, specification adopted and published by that technical society, organization or body, as of the date of the bid opening, unless the provisions of the N.Y.C.C.C. adopts a different or earlier dated version of such standard. All references to the ICC A117.1 are only to the 2009 version, whether or not a specific version is specified.

B. APPLICABILITY OF STANDARDS: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect, to the extent referenced, as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference.

C. CONFLICTING REQUIREMENTS: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantity or quality, comply with the most stringent requirements. Immediately refer uncertainties and requirements that are different but apparently equal, to the Commissioner in writing for a decision before proceeding.

D. STANDARD SPECIFICATIONS - When no reference is made to a code, standard, or specification, the Standard Specifications of the ASTM or the AIEE, as the case may be, shall govern.

E. REFERENCES - Reference to a technical society, organization, or body may be made in the Specifications by abbreviations. Abbreviations and acronyms used in the Specifications and other Contract Documents mean the associated name. The following names are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the Issue Date of the Contract Documents.

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AAPFCO	Association of American Plant Food Control Officials
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists (The)
ABAA	Air Barrier Association of America
ABMA	American Bearing Manufacturers Association
ACI	ACI International (American Concrete Institute)
ACAC	American Council for Accredited Certification
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AGMA	American Gear Manufacturer Association
AHA	American Hardboard Association (Now part of CPA)
AHAM	Association of Home Appliance Manufacturers
AI	Asphalt Institute

AIA	American Institute of Architects (The)
AIEE	American Institute of Electrical Engineers
AIHA	American Industrial Hygiene Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)
ALSC	American Lumber Standard Committee, Incorporated
ALI	Automotive Lift Institute
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	APA - The Engineered Wood Association
APA	Architectural Precast Association
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASA	American Standards Association
ASAE	American Society of Agricultural Engineers
ASCE/SEI	American Society of Civil Engineers, Structural Engineering Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (Formerly: American Society for Testing and Materials)

AWCI	Association of the Wall and Ceiling Industry
AWCMA	American Window Covering Manufacturers Association (Now WCSC)
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWSC	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BICSI	Building Industry Consulting Services International
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
BISSC	Baking Industry Sanitation Standards Committee
CDPH	California Department of Public Health
CIBSE	Charted Institute of Building Services Engineers
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Consumer Electronics Association
CESB	Council of Engineering and Scientific Specialty Boards
CFFA	Chemical Fabrics & Film Association, Inc.
CFSEI	Cold-Formed Steel Engineers Institute
CGA	Compressed Gas Association
CGSB	Canadian General Standards Board
CIMA	Cellulose Insulation Manufacturers Association
CIPRA	Cast Iron Pipe Research Association

CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CPA	Composite Panel Association
CPPA	Corrugated Polyethylene Pipe Association
CPSC	Consumer Product Safety Commission
CRI	Carpet & Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CSSA	Certified Steel Stud Association
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DASMA	Door and Access Systems Manufacturer’s Association International
DHI	Door and Hardware Institute
DOC	U.S. Department of Commerce – National Institute of Standards and Technology
EIA	Electronic Industries Alliance
DOJ	U.S. department of Justice
EIMA	EIFS Industry Members Association
DOL	U.S. Department of labor

EJCDC	Engineers Joint Contract Documents Committee
DOTn	U.S. Department of Transportation
EN	European Committee of Standards
EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association
EVO	Efficiency Valuation Organization
FEMA	Federal Emergency Management Agency
FGIA	Fenestration and Glazing Industry Alliance
FIBA	Federation Internationale de Basketball Amateur (The International Basketball Federation)
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FMG	FM Global (Formerly: FM - Factory Mutual System)
FMRC	Factory Mutual Research (Now FMG)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.
FSA	Fluid Sealing Association
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Now GSI)
GS	Green Seal
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)

HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
HUD	U.S. Department of Housing and Urban Development
IAPMO	International Association of Plumbing and Mechanical Officials
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation
ICC	International Code Council, Inc.
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IEST	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
IICRC	Institute of Inspection, Cleaning, and Restoration
ILIA	Indiana Limestone Institute of America, Inc.
IPEMA	International Play Equipment Manufacturers Association
ISA	International Society of Arboriculture
ISO	International Organization for Standardization
ISSFA	International Solid Surface Fabricators Association
ITS	Intertek

ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LMA	Laminating Materials Association (Now part of CPA)
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.
MFMA	Metal Framing Manufacturers Association
MH	Material Handling (Now MHIA)
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
MIL	Military Specification Standards of the US Dept of Defense
MPEG	Moving Picture Experts Group
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International (National Association of Corrosion Engineers International)
NADCA	National Air Duct Cleaners Association
NAGWS	National Association for Girls and Women in Sport
NAIMA	North American Insulation Manufacturers Association
NBA	National Basketball Association
NBGQA	National Building Granite Quarries Association, Inc.
NCAA	National Collegiate Athletic Association (The)
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute

NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NETA	InterNational Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	NFPA (National Fire Protection Association)
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NICET	National Institute for Certification in Engineering Technologies
NLGA	National Lumber Grades Authority
NIS	National Institute of Standards and Technology
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association)
NRCA	National Roofing Contractors Association
NRDCA	National Roof Deck Association
NRMCA	National Ready Mixed Concrete Association
NSI	Natural Stone Institute
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)

NTRMA	National Tile Roofing Manufacturers Association (Now TRI)
NWWDA	National Wood Window and Door Association (Now WDMA)
OPL	Omega Point Laboratories, Inc. (Acquired by ITS - Intertek)
PCI	Precast / Pre-stressed Concrete Institute
PDCA	Painting & Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PLANET	Professional Landcare Network (Formerly: ACLA - Associated Landscape Contractors of America)
PPS	Power Piping Society
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
RMI	Rack Manufacturers Institute
RTI	(Formerly: NTRMA - National Tile Roofing Manufacturers Association) (Now TRI)
RUS	Rural Utilities Service, Department of Agriculture
SAE	SAE International
SCAQMD	South Coast Air Quality Management District
SCS	Scientific Certification System
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SGCC	Safety Glazing Certification Council

SHBI	Steel Heating Boiler Institute
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)
SFIA	Steel Framing Industry Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMPTE	Society of Motion Picture and Television Engineers
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)
SPIB	Southern Pine Inspection Bureau (The)
SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSMA	the Steel Stud Manufacturers Association
SSPC	SSPC: The Society for Protective Coatings
SSSA	Soil Science Society of America
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TABB	Testing, Adjusting, and Balancing Bureau
TCA	Tile Council of America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society

TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute (Formerly: RTI - Roof Tile Institute)
UL	Underwriters Laboratories Inc.
ULC	Underwriters Laboratories of Canada
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball
USC	United States Code
USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association (Now WCSC)
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WNBA	Women's National Basketball Association
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)
WIC	Woodwork Institute of California (Now WI)
WMMPA	Wood Moulding & Millwork Producers Association
WRI	Wire Reinforcement Institute, Inc.
USEPA	United States Environmental Protection Agency
WSRCA	Western States Roofing Contractors Association

WWPA Western Wood Products Association

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 50 00
TEMPORARY FACILITIES, SERVICES AND CONTROLS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:
1. Temporary Water System
2. Temporary Sanitary Facilities
3. Temporary Electric Power, Temporary Lighting System, and Site Security Lighting
4. Temporary Heat
5. Dewatering Facilities and Drains
6. Temporary Field Office for Contractor
7. DDC Field Office
8. Material Sheds
9. Temporary Enclosures
10. Temporary Partitions
11. Temporary Fire Protection
12. Work Fence Enclosure
13. Rodent and Insect Control
14. Plant Pest Control Requirements
15. Project Identification Signage
16. Project Construction Sign and Rendering
17. Security Guards/Fire Guards on Site
18. Safety

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY

B. Section 01 42 00 REFERENCES

C. Section 01 54 11 TEMPORARY ELEVATORS AND HOISTS

D. Section 01 54 23 TEMPORARY SCAFFOLDS AND SWING STAGING

E. Section 01 77 00 CLOSE OUT PROCEDURES

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	Definition
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the Design Consultant may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Permanent Enclosure	As determined by the Commissioner, permanent or temporary roofing that is complete, insulated, and weather tight; exterior walls which are insulated and weather tight; and all openings that are closed with permanent construction or substantial temporary closures.

1.5 SUBMITTALS:

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Reports: Submit reports of tests, inspections, meter readings and similar procedures for temporary use.

1.6 PROJECT CONDITIONS:

A. Temporary Use of Permanent Facilities and Services: The Contractor will be responsible for the operation, maintenance, and protection of each permanent facility and service during its use as a construction facility before Final Acceptance by the City, regardless of previously assigned responsibilities.

B. The Contractor must install, operate, maintain and protect temporary facilities, services, and controls, including without limitation:

1. Keep temporary services and facilities clean and neat in appearance;
2. Operate temporary services in a safe and efficient manner;
3. Relocate temporary services and facilities as needed as Work progresses;
4. Do not overload temporary services and facilities or permit them to interfere with progress;
5. Provide necessary fire prevention measures; and
6. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on-Site.

1.7 NON-REGULAR WORK HOURS (OVERTIME):

A. The Contractor must provide the temporary services, facilities and controls set forth in this section during non-regular working hours if the Contract Drawings and/or the Specifications indicate that the Work, or specific components thereof, must be performed during non-regular working hours. In such case, all costs for the provision of temporary services, facilities and controls during non-regular working hours will be deemed included in the total Contract price.

B. The Contractor must provide the temporary services, facilities and controls set forth in this section during non-regular working hours if a change order is issued directing the Contractor to perform the Work, or specific components thereof, during non-regular working hours. In such case, compensation for the provision of temporary services, facilities and controls during non-regular working hours will be provided

through the change order.

1.8 SERVICES BEYOND COMPLETION DATE:

A. The Contractor must provide the temporary services, facilities and controls set forth in this section until the date on which it completes all required Work at the Site, including all Final Approved Punch List Work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. The Contractor must provide such temporary services, facilities and controls even if completion of all required Work at the Site occurs after the time fixed for such completion in Schedule A.

PART II – PRODUCTS

2.1 MATERIALS:

A. The Contractor must provide undamaged materials in serviceable condition and suitable for use intended.

B. Tarpaulins: Waterproof, fire-resistant UL labeled with flame spread rating of fifteen (15) or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

C. Water: Potable and in compliance with requirements of the New York City Department of Environmental Protection (DEP).

2.2 EQUIPMENT:

A. The Contractor must provide undamaged equipment in serviceable condition and suitable for use intended.

B. Water Hoses: Heavy-duty abrasive-resistant flexible rubber hoses, one hundred (100) feet (thirty (30) m) long with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

C. Electric Power Cords: Grounded extension cords.

1. Provide hard-service cords where exposed to abrasion or traffic.

2. Provide waterproof connectors to connect separate lengths of electric cords where single lengths do not reach areas of construction Activity.

3. Do not exceed safe length-voltage ratio.

D. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART III –EXECUTION:

3.1 INSTALLATION, GENERAL:

A. The Contractor must locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. The Contractor must provide each facility ready for use when needed to avoid delay. The Contractor must not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities as approved by the Resident Engineer.

3.2 TEMPORARY WATER SYSTEM:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2 A

A. TEMPORARY WATER SYSTEM - NEW FACILITIES: During construction, the Contractor must furnish a Temporary Water System as set forth below.

1. Immediately after the Commissioner has issued an order to start the Work, the Contractor must file an application with DEP for the schedule of charges for water use during construction. The Contractor will be responsible for payment of water charges.

2. Immediately after the Commissioner has issued an order to start the Work, the Contractor must file an application with DEP's Bureau of Water Supply and obtain a permit to install the temporary water supply system. The system must be installed and maintained for the use of the Contractor and its Subcontractors. A copy of the above-mentioned permit must be filed with the Commissioner. The Contractor must provide temporary water main, risers and waste stacks as directed and install on each floor, outlets with two (2) 3/4" hose valve connections over a barrel installed on a steel pan. The Contractor must provide drains from the pans to the stack and house sewer and hose bibs to drain the water supply risers and mains. During winter months, the Contractor must take the necessary precautions to prevent the temporary water system from freezing. The Contractor must provide repairs to the temporary water supply system for the duration of the Project until said temporary system is dismantled and removed.

3. Disposition of Temporary Water System: The Contractor will be responsible for dismantling the temporary water system when no longer required for the construction operations, or when replaced by the permanent water system installed for the Project, or as otherwise directed by the Resident Engineer. All repair work resulting from the dismantling of the temporary water system will be the responsibility of the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2 B

B. TEMPORARY WATER SYSTEM – PROJECTS IN EXISTING FACILITIES:

1. When approved by the Commissioner, use of existing water system will be permitted for temporary water service during construction, as long as the system is cleaned and maintained in a condition acceptable to the Commissioner. At Substantial Completion, the Contractor must restore the existing water system to conditions existing before initial use.

2. The Contractor will be responsible for all repairs to the existing water system permitted to be used for temporary water service during construction. The Contractor will be responsible to maintain the existing system in a clean condition on a daily basis, acceptable to the Commissioner.

3. The Contractor will be responsible for payment of water charges as directed by the Commissioner. Billing will be in accordance with the New York City Water Board Water and Wastewater Rate Schedule.

C. WASH FACILITIES: The Contractor must install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition, including without limitation:

1. Dispose of drainage properly.

2. Supply cleaning compounds appropriate for each condition; and

3. Include safety showers, eyewash fountains and similar facilities for the convenience, safety and sanitation of personnel.

D. DRINKING WATER FACILITIES: The Contractor must provide drinking water fountains or containerized tap-dispenser bottled-drinking water units, complete with paper cup supplies. Where power is available, provide

electric water coolers to maintain dispensed water temperature at forty-five (45) to fifty-five (55) deg. F (7 to 13 deg. C).

3.3 TEMPORARY SANITARY FACILITIES:

A. The Contractor must provide toilets, wash facilities, and drinking water fixtures in compliance with regulations and health codes for type, number, location, operation and maintenance of fixtures and facilities. Provide toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each facility, and provide covered waste containers for used materials.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3 B

B. SELF-CONTAINED TOILET UNITS:

1. The Contractor must provide temporary single-occupant toilet units of the chemical, aerated re-circulation, or combustion type for use by all construction personnel. Units must be properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material. Quantity of toilet units must comply with the latest Occupational Safety and Health Administration (OSHA) regulations.

2. Toilets: The Contractor must install separate, self-contained toilet units for male and female personnel. Shield toilets to ensure privacy.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3 C

C. EXISTING TOILETS:

1. TOILET FACILITIES: When approved by the Commissioner, the Contractor must arrange for the use of existing toilet facilities by all personnel during the execution of the Work. The Contractor will be responsible to clean and maintain facilities in a condition acceptable to the Resident Engineer and, at Substantial Completion, to restore facilities to the condition at the time of initial use.

2. MAINTENANCE - The Contractor must maintain the temporary toilet facilities in a clean and sanitary manner and make all necessary repairs.

3. NUISANCES - The Contractor must not cause any sanitary nuisance to be committed by its employees or the employees of its Subcontractors in or about the Work and must enforce all sanitary regulations of the City and State Health Authorities.

3.4 TEMPORARY ELECTRIC POWER, TEMPORARY LIGHTING SYSTEM, AND SITE SECURITY LIGHTING:

A. SCOPE: This section sets forth the General Conditions and procedures relating to Temporary Electric Power, Temporary Lighting System, and Site Security Lighting during the construction period.

B. TEMPORARY ELECTRIC POWER: The Contractor must provide and maintain a temporary electric power service and distribution system of sufficient size, capacity and power characteristics required for construction operations for all required Work by the Contractor and its Subcontractors, including but not limited to, power for the temporary lighting system, site security lighting, construction equipment, hoists, temporary elevators and all field offices. temporary electric power must be provided as follows:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B (1)

1. CONNECTION TO UTILITY LINES:

a. Temporary electric power service for use during construction must be provided as follows: The Contractor must make all necessary arrangements with the public utility company and pay all charges for the Temporary Electric Power system. The Contractor must include in its total Contract price any charges for temporary electric power, including charges that may be made

by the public utility company for extending its electrical facilities, and for making final connections. The Contractor will make payment directly to the public utility company.

b. APPLICATIONS FOR METER: The Contractor must complete an application to the public utility company and sign all documents necessary for, and pay all charges incidental to, the installation of a watt hour meter or meters for Temporary Electric Power. The Contractor must pay to the public utility company all bills for temporary electric energy used throughout the Work as they become due.

c. SERVICE AND METERING EQUIPMENT: The Contractor must furnish and install, at a suitable location on the Site, approved service and metering equipment for the Temporary Electric Power System, ready for the installation of the public utility company's metering devices. The temporary service mains to and from the metering location must not be less than one hundred (100) Amperes, 3-phase, 4-wire and must be of sufficient capacity to take care of all demands for all construction operations and must meet all requirements of the New York City Electrical Code.

d. PAYMENT: See Sub-Section 3.4.F regarding payment for this scope of work.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B (2)

2. CONNECTION TO EXISTING ELECTRICAL POWER SERVICE:

a. When approved by the Commissioner, electrical power service for the temporary lighting system and for the operation of small tools and equipment less than ¼ horsepower may be taken from the existing electric distribution system if the existing system is of adequate capacity for the temporary power load. The Contractor must cooperate and coordinate with the facility custodian, so as not to interfere with the normal operation of the facility.

b. There will be no charge to the Contractor for the electrical energy consumed.

c. The Contractor must provide, maintain and pay all costs for separate temporary electric power for any temporary power for equipment larger than 1/4 horsepower. When directed by the Commissioner, the Contractor must remove its own temporary power system.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B (3)

3. ELECTRICAL GENERATOR POWER SERVICE:

a. When connection to utility lines or existing facility electric service is not available or is not adequate to supply the electric power need for construction operations, the Contractor must provide self-contained generators to provide power beyond that available.

b. Pay for all energy consumed in the progress of the Work, exclusive of that available from the existing facility or utility company.

c. Provide for control of noise from the generators.

d. Comply with the Ultra Low Sulfur Fuel in Non-Road Vehicles requirements as set forth in Article 5.4 of the Contract.

e. PAYMENT: See Sub-Section 3.4.F regarding payment for this scope of work.

C. USE OF COMPLETED PORTIONS OF THE ELECTRICAL WORK:

1. USE OF MAIN DISTRIBUTION PANEL: As soon as the permanent electric service feeders and equipment metering equipment and main distribution panel are installed and ready for operation, the Contractor must have the temporary lighting and power system changed over from the temporary service points to the main distribution panel.

2. COST OF CHANGE OVER: The Contractor will be responsible for all costs due to this change over of service and it must also make application to the public utility company for a watt hour meter to be set on the permanent meter equipment.

3. The requirements for temporary electric power service specified herein must be adhered to after change over of service until Final Acceptance of the Project.

4. NO EXTRA COST: The operation of the service and switchboard equipment will be under the supervision of the Contractor, but this will in no way be interpreted to mean the acceptance of such part of the installation or relieve the Contractor from its responsibility for the complete Work or any part thereof. There will be no additional charge for supervision by the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 D

D. TEMPORARY LIGHTING SYSTEM:

1. The Contractor must provide adequate service for the temporary lighting system, or a minimum of one hundred (100) Amperes, 3-phase, 4-wire service for the temporary lighting system, whichever is greater, and make all necessary arrangements with the public utility company and pay all charges by them for the Temporary Lighting System.

2. The Contractor must furnish and connect to the metered service point a Temporary Lighting System to illuminate the entire area where Work is being performed and points adjacent to the Work, with separately fused circuits for stairways and bridges. Control switches for stairway circuits must be located near entrance on ground floor.

3. ITEMS: The Temporary Lighting System provided by the Contractor must consist of wiring, fixtures, left-hand double sockets (one (1) double socket for every 400 square feet, with one (1) lamp and one (1) three-prong outlet), lamps, fuses, locked-type guards, pigtails and any other incidental material. Additional details may be outlined in the detailed Specifications for the electrical Work. Changes may be made, provided the full equivalent of those requirements is maintained.

4. The Temporary Lighting System will be progressively installed as required for the advancement of the Work under the Contract.

5. RELOCATION: The cost for the relocation or extension of the original Temporary Lighting System, as required by the Contractor or its Subcontractors, that is not required due to the normal advancement of the Work, as determined by the Resident Engineer, will be borne by the Contractor.

6. PIGTAILS: The Contractor must furnish pigtails with left-hand sockets with locked-type guards and forty (40) feet of rubber covered cable. The Contractor must furnish and distribute a minimum of three (3) complete pigtails to each Subcontractor. See the detailed Electrical Specifications for possible additional pigtails required.

7. LAMPS: The Contractor must furnish and install one (1) complete set of lamps, including those for the trailers. Broken and burned out lamps in the temporary lighting system, DDC field office, and construction trailers must be replaced by the Contractor. All lamps must be compact fluorescent.

8. CIRCUIT PROTECTION: The Contractor must furnish and install Ground Fault Interruption (GFI) protection for the temporary lighting and site security lighting systems.

9. MAINTENANCE OF TEMPORARY LIGHTING SYSTEM:

   a. The Contractor must maintain the Temporary Lighting System in good working order during the scheduled hours established.

   b. The Contractor must include in its total Contract price all costs in connection with the Temporary Lighting System, including all costs for installation, maintenance and electric power.

10. REMOVAL OF TEMPORARY LIGHTING SYSTEM: The temporary lighting system must be removed by the Contractor when authorized by the Commissioner.

11. HAND TOOLS: The temporary lighting system must not be used for power purposes, except that light hand tools not larger than 1/4 horsepower may be operated from such system by the Contractor and its Subcontractors.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 E

E. SITE SECURITY LIGHTING (NEW CONSTRUCTION ONLY):

1. The Contractor must furnish, install and maintain a system of site security lighting, as herein specified, to illuminate the construction Site of the Project, with the system connected to and energized from the Temporary Lighting System. All costs in connection with site security lighting will be deemed included in the total Contract price.

2. It is essential that the site security lighting system be completely installed and operating at the earliest possible date. The Contractor must direct its Subcontractors to cooperate, coordinate and exert every effort to accomplish an early complete installation of the site security lighting system. If, after the system is installed and in operation, a part of the system interferes with the Work of any trade, the Contractor will be completely responsible for the expense of removing, relocating, and replacing all equipment necessary to reinstate the system to proper operating conditions.

3. The system must consist of flood lighting by pole-mounted guarded sealed-beam units. Floodlight units must be mounted sixteen (16) feet above grade. Floodlights must be spaced around the perimeter of the Site to produce an illumination level of no less than one (1) foot candle around the perimeter of the Site, as well as in any potentially hazardous area or any other area within the Site that might be deemed by the Resident Engineer to require security illumination. The system must be installed in a manner acceptable to the Resident Engineer. The first lighting unit in each circuit must be provided with a photoelectric cell for automatic control. The photoelectric cell must be installed as per manufacturer's recommendations.

4. All necessary poles must be furnished and installed by the Contractor.

5. The site security lighting must be kept illuminated at all times during the hours of darkness. The Contractor must, at its own expense, keep the system in operation and must furnish and install all material necessary to replace all damaged or burned out parts.

6. The Contractor must be on telephone call alert for maintaining the system during the operating period stated above.

7. All materials and equipment furnished under this section will remain the property of the Contractor and must be removed and disposed of by the Contractor when authorized in writing by the Resident Engineer.

F. PAYMENT FOR TEMPORARY ELECTRICAL

1. The following temporary Electrical scope will be paid for on unit price basis:

   a. Temporary Electric power where the Contractor pays for the utility costs (subsection 3.4.B.1)

   b. Temporary Electric power where the Contractor provides generator service (subsection 3.4.B.3)

2. All temporary electrical scope described in Subsection 3.4 except as noted above in 3.4.F.1 must be included in the Contractor’s lump sum price.

3. For the temporary electric power that will be paid for by unit price:

a. The quantity to be measured for payment under this item will be the number of months (to the nearest 1/4 month increment) that the Contractor satisfactorily provides for temporary electric power in accordance with these General Conditions.

b. The unit price bid per month for temporary electric power must include the cost of furnishing all labor, materials, plant, equipment, insurance, and incidentals required to provide temporary electric power, all in accordance with the Contract Drawings, these specifications, and the directions of the Commissioner.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.5

3.5 TEMPORARY HEAT:

A. GENERAL:

1. Definition: The provision of Temporary Heat means the provision of heat in order to permit construction to be performed in accordance with the Progress Schedule during all seasons of the year and to protect the Work from the harmful effects of low temperature. In the event the building, or any portion thereof, is occupied during construction, the provision of Temporary Heat will include the provision of heat to permit normal operations in such occupied areas.

   a. The provision of Temporary Heat must be in accordance with the temperature requirements set forth in sub-section 3.5 C herein.

   b. The provision of Temporary Heat must include the provision of: 1) all fuel necessary and required, 2) all equipment necessary and required, and 3) all operating labor necessary and required. Operating labor must mean that minimum force required for the safe day-to-day operation of the system for the provision of Temporary Heat and must include, without limitation, heating maintenance labor and/or fire watch as required by New York City Fire Department (FDNY) regulations. Operating labor may be required seven (7) days per week and during non-regular working hours, for the period of time required by seasonal weather conditions.

   c. In the event the building, or any portion thereof, is occupied and the Project involves the replacement, modification, and/or shut down of the permanent heating system, or any key component thereof, and such system is a combined system which furnishes domestic hot water for the building occupants, the provision of Temporary Heat must include the provision of domestic hot water at the same temperature as the system which is being replaced. Domestic hot water must be provided in accordance with the phasing requirements set forth in the Contract Documents.

2. Responsibility: The Contractor's responsibility for the provision of Temporary Heat, including all expenses in connection therewith, is as set forth below:

   a. Projects involving enclosure of the building:

      i. Prior to Enclosure: Until the Commissioner determines that the building has been enclosed, as set forth in sub-section 3.5 B, the Contractor is responsible for the provision of Temporary Heat.

      ii. Post Enclosure: Once the Commissioner determines that the building, or any portion thereof, has been enclosed, as set forth in sub-section 3.5 B, the Contractor is responsible for the provision of Temporary Heat by one or more of the following means: 1) by an existing heating system (if any), 2) by a permanent heating system which is being installed as part of the Project, or 3) by a temporary heating system(s).

      iii. The Contractor must, within two (2) weeks of the kick-off meeting, submit to DDC for review its proposed plan to provide Temporary Heat. Such plan is subject to approval

by the Resident Engineer. The Contractor must provide Temporary Heat in accordance with the approved plan until written acceptance by the Commissioner of the Work of all Subcontractors, including punch list Work, unless directed otherwise in writing by the Commissioner. The responsibility of the Contractor provided for herein is subject to the exception set forth in sub-section 3.5 A.2 (b) herein.

b. Projects not involving enclosure of the building:

i. If the Project involves the installation of a new permanent heating system if one did not exist previously, or the replacement, modification, and/or shut down of the existing permanent heating system, or any key component thereof, the Contractor will be responsible for the provision of Temporary Heat, except as otherwise provided in sub-section 3.5 H.3(b).2 herein.

ii. If the Project does not involve the installation of a new permanent heating system if one did not exist previously, or the replacement, modification, and/or shut down of the existing permanent heating system, or any key component thereof, there is no Contractor responsibility of the provision of Temporary Heat, unless otherwise specified in the Contract Documents. However, if the Commissioner, pursuant to sub-section 3.5 H.3 (b).1 herein, determines that the provision of Temporary Heat is necessary due to special and/or unforeseen circumstances, the Contractor will be responsible for the provision of Temporary Heat and must be paid for the same in accordance with sub-section 3.5 H.3 (b).1 herein.

B. ENCLOSURE OF STRUCTURES:

1. Notification: The Contractor must notify all of its Subcontractors and the Resident Engineer at least thirty (30) Days prior to the anticipated date that the building(s) will be enclosed.

2. Commissioner Determination: The Commissioner will determine whether the building, or any portion thereof, has been enclosed. As indicated in sub-section 3.5 A.2 above, once the building has been enclosed, the Contractor will be responsible for the provision of Temporary Heat. The Commissioner's determination with respect to building enclosure will be based upon all relevant facts and circumstances, including without limitation, 1) whether the building meets the criteria set forth in Paragraph 3 below, and 2) whether the openings in the building, such as doorways and windows, have been sufficiently covered so as to provide reasonable heat retention and protection from the elements.

3. Criteria for enclosure:

a. Roof Area:

i. A building will be considered to be roofed when the area to be roofed is covered by a permanent structure and all openings through the permanent structure are covered and protected by temporary covers as described in Paragraph (c) below.

ii. Intermediate floor structures of multi-floor buildings will be considered to be roofed subject to the same requirements of the building roof.

iii. The final roofing system need not be in place for the building or structure to be determined to be enclosed, provided, however, all openings through the permanent structure covering the roof must be covered and protected by temporary covers, as described in Paragraph (c) below.

b. Walls: For the walls to be determined to be enclosed, permanent exterior wall elements or facing material must be in place and all openings must be covered and protected by temporary covers, as described in Paragraph (c) below.

c. Temporary Covers: In order to be acceptable, temporary covers must be securely fixed to prevent the entrance of rain, snow and direct wind. The minimum material requirements for temporary covers are as follows: 1) minimum ten (10) millimeter plastic, 2) minimum twelve (12) ounce waterproof canvas tarpaulins, or 3) a minimum three-eighths (3/8) inch thickness exterior grade plywood.

d. Temporary covers for openings will be the responsibility of the Contractor and such Work will be deemed included in the Contract price.

C. TEMPERATURE REQUIREMENTS:

1. Unoccupied Buildings: The temperature requirement for the provision of Temporary Heat in unoccupied buildings will be the GREATER of the following: 1) fifty (50) degrees Fahrenheit, or 2) the temperature requirement for the particular type of Work set forth in the Contract Documents.

2. Occupied Buildings: The temperature requirement for the provision of Temporary Heat in occupied buildings, or portions thereof, will be the GREATER of the following: 1) sixty-eight (68) degrees Fahrenheit, or 2) the temperature requirement for the particular type of Work set forth in the Contract Documents.

D. DURATION:

1. The Contractor is required to provide Temporary Heat until Final Acceptance, including all punch list work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. The Contractor is responsible for the provision of Temporary Heat for the time specified herein, regardless of any delays in completion of the Project, including delays that result in the commencement of the provision of Temporary Heat during a season that is later than that which may have been originally anticipated. Payment for temporary heat will be made on a unit price basis in accordance with Sub-Section 3.5.K.

E. METHOD OF TEMPORARY HEAT:

1. The method of temporary heat must be in conformance with the New York City Fire Code and with all applicable laws, rules, and regulations. Prior to implementation, such method must be subject to the written approval of the Commissioner.

2. The method of temporary heat must:

a. Not cause the deposition of dirt or smudges upon any finished Work or cause any defacement or discoloration to the finished Work.

b. Not be injurious or harmful to people or materials.

c. Portable fueled heating devises or equipment will NOT be allowed for use as temporary heat other than construction-related curing or drying in conformance with the NYC Fire Code.

3. No open fires will be permitted.

F. TEMPORARY HEATING SYSTEM:

1. The temporary system for the provision of Temporary Heat provided by the Contractor following enclosure of the building must be complete, including, subject to provisions of paragraph E above, boilers pumps, radiators, space heaters, water and heating piping, insulation and controls. The temporary system for the provision of Temporary Heat must be capable of maintaining the minimum temperature requirements set forth in Paragraph C above.

G. COORDINATION:

1. The Contractor, in the provision of Temporary Heat, must coordinate its operations in order to insure sufficient and timely performance of all required Work, including Work performed by trade Subcontractors. The Contractor must supply and pay for all water required and used in the building

for the operation of the heating system(s) for the purpose of Temporary Heat. The Contractor must include all expenses in connection with the supply of water for Temporary Heat in its total Contract price. During the period in which Temporary Heat in an enclosed building is being furnished and maintained, the Contractor must provide proper ventilating and drying, open and close the windows and other openings when necessary for the proper execution of the Work and when directed by DDC. The Contractor must maintain all permanent or temporary enclosures at its own expense.

H. USE OF PERMANENT HEATING SYSTEMS:

1. Use of Permanent Heating System for Temporary Heat after Building Enclosure:

   a. The Contractor must provide all labor and materials to promptly furnish and set all required equipment, convectors and/or radiators, piping, valves, fitting, etc., in ample time for their use for the provision of Temporary Heat after enclosure of the building.

   b. New portions of the permanent heating system that are used for furnishing Temporary Heat must be left in near-perfect condition when delivered to the City for operation. Any repairs required, other than for ordinary wear and tear on the equipment, must be made by the Contractor at his/her expense. The starting date for the warranty or guarantee period for such equipment must be the date of Substantial Completion acceptance.

   c. In the event that the Contractor does not advance the installation of the permanent heating system in sufficient time to permit its use for Temporary Heat as determined by DDC, the Contractor must furnish and install a separate system for the provision of Temporary Heat as required to maintain the minimum temperature requirements set forth in Paragraph C above.

2. All equipment for the system for the provision of Temporary Heat must be placed so as to comply with the requirements specified hereinbefore, and must be connected, disconnected and suitably supported and located so as to permit construction Work, including finish Work such as wall plastering and painting, to proceed. The installation of the system for the provision of Temporary Heat by the Contractor, including the placing of ancillary system equipment, must be coordinated with the operations of all trade Subcontractors so as to insure sufficient and timely performance of the Work. Once the permanent heating system is operating properly, the Contractor must remove all portions of the system for Temporary Heat not part of the permanent heating system.

I. RELATED ELECTRICAL WORK:

1. The Contractor must be responsible for providing the items set forth below and must include all expenses in connection with such items in its total Contract price. The Contractor must provide such items promptly when required and must in all respects coordinate its Work with the Work performed by trade Subcontractors in order to facilitate the provision of Temporary Heat.

   a. The Contractor must provide all labor, materials, equipment and power necessary and required to furnish and maintain any temporary or permanent electrical connections to all equipment specified to be connected as part of the work of the Contractor’s Contract.

   b. The Contractor must supply and pay for all power necessary and required for the operation of the system for the provision of Temporary Heat and/or the permanent heating system used for Temporary Heat. Such power must be provided by the Contractor for the duration the Contractor is required to provide Temporary Heat, as set forth in sub-section 3.5 D herein.

2. In providing the items set forth in Paragraph 1 above, the Contractor is advised that labor may be required seven (7) days a week and/or during non-regular working hours for the period of time required by seasonal weather conditions.

J. RELATED PLUMBING WORK:

1. The Contractor must be responsible for providing all labor, materials, and equipment necessary and required to furnish and maintain all temporary or permanent connections to all equipment or plumbing

outlets specified to be provided as part of the Work of this Contract. The Contractor must include all expenses in connection with such items of Work in its total Contract price. The Contractor must provide such items of Work promptly when required and must in all respects coordinate its Work with the Work performed by trade Subcontractors in order to facilitate the provision of Temporary Heat.

2. In the event portions of the permanent plumbing equipment furnished by the Contractor as part of the Work of this Contract are used for the provision of Temporary Heat either during construction or prior to acceptance by the City of the complete plumbing system, the Contractor will be responsible to provide such plumbing equipment to the City in near-perfect condition and must make any repairs required, other than for ordinary wear and tear on the equipment, at the Contractor's expense. The starting date for warranty and/or guarantee period for such plumbing equipment must be the date of Substantial Completion by the City.

3. For Projects requiring the installation of new and/or modified gas service, as well as associated meter installations, the Contractor must promptly perform all required filings and coordination with the utility companies in order to expedite the installation, testing, and approval of the gas service and associated meter(s).

K. PAYMENT FOR TEMPORARY HEAT

1. Payment for temporary heat will be made on a unit price basis.

2. The quantity to be measured for payment under this item will be the number of months (to the nearest 1/4 month increment) that the Contractor satisfactorily provides for temporary heat in accordance with these specifications.

3. The unit price bid per month for temporary heat must include the cost of furnishing all labor, materials, plant, equipment, insurance, and incidentals required to provide temporary heat, all in accordance with the Contract Drawings, these specifications, and the directions of the Commissioner. When directed in writing by the Commissioner, temporary heat will be provided and paid for a period of time beyond 6 months past the Substantial Completion date. Payment for each month's temporary heat after the date of Substantial Completion acceptance will be made as part of the final payment.

3.6 STORM WATER CONTROL, DEWATERING FACILITIES AND DRAINS:

A. PUMPING:

1. Comply with requirements of authorities having jurisdiction. Maintain Project Site, excavations, and construction free of water. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rainfall.

2. Contractor must furnish and install all necessary automatically operated pumps of adequate capacity with all required piping to run-off agencies, so as to maintain the excavation, cellar floor, pits and exterior depressions and excavations free from accumulated water during the entire period of construction and up to the date of Final Acceptance of Work of the Contract.

3. All pumps must be maintained at all times in proper working order.

4. Dispose of rainwater in a lawful manner that will not result in flooding the Project or adjoining properties nor endanger permanent Work or temporary facilities.

5. Remove snow and ice as required to minimize accumulations.

3.7 TEMPORARY FIELD OFFICE FOR CONTRACTOR:

A. The Contractor must establish a temporary field office for its own use at the Site during the period of construction, at which readily available copies of all Contract Documents must be kept.

B. The field office must be located where it will not interfere with the progress of any part of the Work or with visibility of traffic control devices.

C. CONTRACTOR'S REPRESENTATIVE: There must be a responsible and competent representative of the Contractor in charge of the office who is duly authorized to receive orders and directions and to put them into effect.

D. Arrangements must be made by the Contractor whereby its representative may be readily available by telephone.

E. All temporary structures must be of substantial construction and neat appearance, and must be painted a uniform gray unless otherwise directed by the Commissioner.

F. CONTRACTOR'S SIGN: The Contractor must post and keep posted on the outside of its field office, office, exterior fence, or wall at Site of Work, a legible sign giving the full name of the company, address of the company and telephone number(s) of responsible representative(s) of the firm who can be reached in the event of an emergency at any time.

G. ADVERTISING PRIVILEGES: The City reserves the right to all advertising privileges. The Contractor must not cause any signs of any kind to be displayed at the Site unless specifically required herein or authorized by the Commissioner.

3.8 DDC FIELD OFFICE:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 A

A. OFFICE SPACE IN EXISTING BUILDING:

1. The Resident Engineer will arrange for office space for sole use in the building where Work is in progress. The Contractor must provide and install a lockset for the door to secure the equipment in the room. The Contractor must provide two (2) keys to the Resident Engineer. After completion of the Project the Contractor must replace the original lockset on the door and ensure its proper operation.

2. In addition to equipment specified in sub-section 3.8 D, the Contractor must provide, for exclusive use of the DDC Field Office, the following:

   a. Two (2) single pedestal desks, 42” x 32”; two (2) swivel chairs with arms and three (3) side chairs without arms to match desk. Two metal (2) lockers, single units, 15” x 18” x 78” overall including 6” legs. Lockers to have flat key locks with two (2) keys each, General Steel products or approved equal. Two (2) full ball bearing suspension four (4) drawer vertical legal filing cabinets with locks, approximately 52”H x 28 ½”D x 18”W.

   b. One (1) 9000 B.T.U air conditioner or as directed by Commissioner. Wiring for the air conditioner must be minimum No. 12 AWG fed from individual circuits in the fuse box.

   c. One (1) folding conference table, 96” x 30” and ten (10) folding chairs.

   d. Two (2) metal wastebaskets.

   e. One (1) fire extinguisher, one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.

   f. One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the Project as required.

3. The Contractor must provide one (1) telephone, where directed and must pay all costs for telephone service for calls within the New York City limits for the duration of the Project.

4. All furniture and equipment, except computer equipment specified in sub-section 3.8 D.3, must

remain the property of the Contractor.

5. Computer workstation quantities must be provided as specified in sub-section 3.8 B 3-a for DDC Managed Projects, or sub-section 3.8 B 3-b for CM Managed Projects.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 B

B. DDC FIELD OFFICE TRAILER:

1. GENERAL: The Contractor must, for the time frame specified herein, provide and maintain at its own cost and expense a DDC Construction Field Office and all related items as specified herein [hereinafter collectively referred to as the "DDC Field Office"] for the exclusive use of the Resident Engineer. The DDC Field Office must be located at the Project Site and must be solely dedicated to the Project. Provision of the DDC Field Office must commence within thirty (30) Days from Notice to Proceed (NTP) and must continue through forty-five (45) Days after Substantial Completion of the required construction at the Project Site. The Contractor must remove the DDC Field Office forty-five (45) Days after Substantial Completion of the required construction, or as otherwise directed in writing by the Commissioner.

2. TRAILER: The Contractor must provide at its own cost and expense a mobile office trailer for use as the DDC Field Office. The Contractor must install and connect all utility services to the trailer within thirty (30) Days from NTP. The trailer must have equipment in compliance with the minimum requirements hereinafter specified. Any permits and fees required for the installation and use of said trailer must be borne by the Contractor. The trailer including furniture and equipment therein, except computer equipment specified in sub-section 3.8D.3 herein, must remain the property of the Contractor.

3. Trailer must be an office-type trailer of the size specified herein, with exterior stairs at entrance. Trailer construction must be minimum 2 x 4 wall construction fully insulated with paneled interior walls, pre-finished gypsum board ceilings and vinyl tile floors.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8.B.3a or SUB-SECTION 3.8.B.3b.

a. 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.

iii. Computer Workstation: Provide one (1) complete computer workstation and one (1) tablet, as specified in sub-section 3.8.D herein, in the private office area as directed by the Resident Engineer.

b. 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.

8. The washroom must be equipped with a flush toilet, wash basin with two (2) faucets, medicine cabinet, complete with supplies and a toilet roll tissue holder. Plumbing and fixtures must be approved house type, with each appliance trapped and vented and a single discharge connection. Five (5) gallon capacity automatic electric heater for domestic hot water must be furnished.

9. HVAC: The trailer must be equipped with central heating and cooling adequate to maintain a temperature of seventy-two (72) degrees during the heating season and seventy-five (75) degrees during the cooling season when the outside temperature is five (5) degrees F. winter and eighty-nine (89) degrees F. summer.

10. Interior lighting must be provided via ceiling mounted fluorescent lighting fixtures to a minimum level of fifty (50) foot candles in the open and private office(s) along with sufficient lighting in the washroom. Broken and burned out lamps must be replaced by the Contractor. A minimum of four (4) duplex convenience outlets must be provided in the open office and two (2) each in the private office(s). These outlets must be in addition to special outlet requirements for computer stations, copiers, HVAC unit, etc. Exterior lighting must be provided for the security of staff and visitors, with lighting provided at all entrances and as directed by the Commissioner.

11. Electrical service switch and panel must be adequately sized for the entire trailer load. Provide dedicated circuits for HVAC units, hot water heater, copiers and other equipment as required. All wiring and installation must conform to the New York City Electrical Code.

12. The following movable equipment must be furnished:

a. Two (2) single pedestal desks, 42" x 32"; two (2) swivel chairs with arms and three (3) side chairs without arms to match desk. Two (2) full ball bearing suspension four (4) drawer

vertical legal filing cabinets with locks and two (2) full ball bearing two (2) drawer vertical legal filing cabinets in each private office located below built-in desk.

b. One (1) folding conference table, 96” x 30” and ten (10) folding chairs.

c. Three (3) metal wastebaskets.

d. One (1) fire extinguisher one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.

e. One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the Contract as required.

13. TRAILER TEMPORARY SERVICE: Plumbing and electrical Work required for the trailer will be furnished and maintained as below.

a. PLUMBING WORK: The Contractor must provide temporary water and drainage service connections to the DDC Field Office trailer for a complete installation. Provide all necessary soil, waste, vent and drainage piping.

Contractor to frost-proof all water pipes to prevent freezing.

1) REPAIRS, MAINTENANCE: The Contractor must provide repairs for the duration of the Project until the trailer is removed from the Site.

2) DISPOSITION OF PLUMBING WORK: At the expiration of the time limit set forth in sub-section 3.8 B 1 herein, the temporary water and drainage connections and piping to the DDC Field Office trailer must be removed by the Contractor and must be plugged at the mains. All piping must become the property of the Contractor for plumbing Work and must be removed from the Site, all as directed. All repair Work due to these removals must be the responsibility of the Contractor.

b. ELECTRICAL WORK:

1) The Contractor must furnish, install and maintain a temporary electric feeder to the DDC Field Office trailer immediately after it is placed at the job Site.

2) The temporary electrical feeder and service switch/fuse must be adequately sized based on the trailer load and installed per the New York City Electrical Code and complying with utility requirements.

3) Make all arrangements and pay all costs to provide electric service.

4) The Contractor must pay all costs for current consumed and for maintenance of the system in operating condition, including the furnishing of the necessary bulb replacements lamps, etc., for the duration of the Project and for a period of forty-five (45) Days after the date of Substantial Completion.

5) Disposition of Electric Work: At the expiration of the time limit set forth, the temporary feeder, safety switch, etc., must be removed and disposed of as directed.

6) All repair Work due to these removals must be the responsibility of the Contractor.

c. MAINTENANCE:

1) The Contractor must provide and pay all costs for regular weekly janitor service and furnish toilet paper, sanitary seat covers, cloth towels and soap and maintain the DDC Field Office in first-class condition, including all repairs, until the trailer is removed from the Site.

2) Supplies: The Contractor must be responsible for providing (1) all office supplies, including without limitation, pens, pencils, stationery, filtered drinking water and sanitary

supplies, and (2) all supplies in connection with required computers and printers, including without limitation, an adequate supply of blank CD's/DVD's, storage boxes for blank CDs/DVDs, and paper and toner cartridges for the printer.

3) Risk of Loss: The entire risk of loss with respect to the DDC Field Office and equipment must remain solely and completely with the Contractor. The Contractor must be responsible for the cost of any insurance coverage determined by the Contractor to be necessary for the field office.

4) At forty-five (45) Days after the date of Substantial Completion, or sooner as directed by the Commissioner, the 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) Telephone and internet access in each private office. Telephone service must include voice mail. All electronic voicemail messages must be automatically forwarded as email attachments, to allow for the voicemails to be played remotely.

4) A remote bell located on outside of trailer.

5) The telephone service must continue until the trailer is removed from the Site.

e. SECURITY CAMERAS: Wi-Fi enabled security cameras must be provided at all entrances and exits, except for fire escapes / emergency stairwells, which do not require cameras. One security camera must be provided for the interior of the DDC Field Office, with the location to be determined by the Commissioner. Cameras must be minimum 1080p video resolution. Cameras must have internet cloud storage, with all videos stored for a minimum of two weeks. The cloud storage must be accessible via desktop or mobile. Cameras may be hardwired for power or battery powered; battery powered cameras must have the batteries changed by the Contractor as required to ensure no lapses of service. Signs must be posted indicating that the area is under video surveillance.

f. PERMITS: The Contractor must make the necessary arrangements and obtain all permits and pay all fees required for this Work.

C. RENTED SPACE: The Contractor has the option of providing, at its cost and expense, rented office or store space in lieu of trailer. Said space must be in the immediate area of the Project and have adequate plumbing, heating and electrical facilities. Space chosen by the Contractor for the DDC Field Office must be approved by the Commissioner before the area is rented. All insurance, maintenance and equipment, including computer workstations and security cameras specified in sub-section 3.8 D in quantities required as specified in sub-section 3.8 B 3 for the DDC Field Office trailer, must also apply to rented spaces.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 D

D. ADDITIONAL EQUIPMENT FOR THE DDC FIELD OFFICE:

1. Photocopying Machine: Stand-alone, heavy duty, electric, dry-process color photocopying type with color scan and send capability via email, a minimum production rate of seventy (70) pages per minute and an adequate supply of copy paper, toner, etc. The machine must be capable of duplex copying paper sizes of 8-1/2 x 11 inches, 8-1/2 x 14 inches and 11 x 17 inches, and have separate trays for each paper size. It must have a document feeder, collator, stapler, and the capability to reduce/enlarge copies between each paper size. The supply of each size copy paper, toner, etc.

must be replenished and the machines must be maintained for the duration of the Contract by the Contractor as required by the Resident Engineer. Make and model can be Minolta, Canon, IBM, Epson, or an approved equivalent, and must be networked to the office computers for printing capability. Copier must remain at job Site until the DDC Field office trailer is removed from the Site.

2. The Contractor must furnish a fax service and a telephone answering service (or computer based equivalent system) at commencement of the Project for the exclusive use of the DDC Field Office. All materials must be new, sealed in manufacturer's original packaging and must have manufacturers' warrantees. All items must remain the property of the City of New York at the completion of the Project.

3. COMPUTER WORKSTATION: The Contractor must provide one (1) complete computer workstation, in quantities specified in sub-section 3.8.B.3, as specified herein:

   a. Hardware/Software Specification:

      1) Computer Equipment: Computers must be provided for all Contracts that have a total Consecutive Calendar Days (CCD) for construction duration, as set forth in Schedule "A", of 180 CCD's or greater. Contracts of lesser duration must not require computers.

      2) Computers furnished by the Contractor for use by City Personnel for the duration of the Contract must be in accordance with the Specific Requirements contained herein, must remain the property of the City of New York at the completion of the Project, and must meet the following minimum requirements:

      3) Personal Computers – Personal Computers must meet the requirements of the US General Services Administration (GSA) Government-Wide Strategic Solutions (GSS) Standard Laptop, Desktop, and Tablet Specifications, V7. (Available online at (Government-Wide Strategic Solutions (GSS) Version 7 Specifications | NITAAC (nih.gov)).

         (a) Computer type for Personal Computers to be “Desktop Small Form Factor.” Computer type for tablet to be “Tablet”
         (b) The following components listed as optional in the GSA specification must be provided with each personal computer: monitor, speakers, optical drive, smart card reader, webcam, and headset.
         (c) The following additional software must be provided with licenses for each computer:
            1. Adobe Acrobat Pro DC or Bluebeam Revu
            2. Microsoft Office Professional
            3. Autodesk AutoCAD LT
            4. Anti-virus software
            5. Microsoft Visio (only one license required per field office)

      iv. DDC Field Office Specs: DDC Field Offices requiring computers must be provided with the following:

         a) One (1) broad-band internet service account. See table below for minimum required upload and download speeds. Telephone service should be bundled together with Internet connectivity. Because of throughput requirements Verizon FIOS is the preferred connectivity provider where available.

Office Personnel #	**Download Speeds (*Minimum*)**	**Upload Speeds (*Minimum*)**
1 – 5	10 Mbps	15 Mbps

6 – 10	20 Mbps	15 Mbps
11 – 15	25 Mbps	15 Mbps
16 – 20	50 Mbps	15 Mbps

This account will be active for the life of the Project. The e-mail name for the account must be the DDC Field Office/Project ID (preferably Gmail or Outlook e.g. ABC1234@gmail.com).

b) One (1) 600 DPI HP Color Laser Jet Printer (twelve (12) pages per minute or faster) with one (1) Extra Paper (Legal Size) (Not required if photocopying machine prints in color).

c) All necessary cabling for equipment specified herein

d) Storage Boxes for Blank CD's

e) Printer Table

f) UPS/Surge Suppressor combo

g) Ten (10) USB Thumb (or Flash) Drives – sixteen (16) GB each

5) All computers required for use in the DDC Field Office must be delivered, installed, and setup in the Field Office by the Contractor.

6) All Computer Hardware must come with a three (3) year warranty for on-site repair or replacement. Additionally, and notwithstanding any terms of the warranty to the contrary, the Contractor is responsible for rectifying all computer problems or equipment failures within one (1) business day.

7) An adequate supply of blank CDs/DVDs, and paper and toner cartridges for the printer must be provided by the Contractor and must be replenished by the Contractor as required by the Resident Engineer.

8) It is the Contractor's responsibility to ensure that electrical service and phone connections are also available at all times; that is, the Field Office Computer(s) is to be powered and turned on twenty-four (24) hours each Day.

9) Broadband connectivity is preferred at each field office location. Please take into consideration that an extra phone line dedicated to the modem must be ordered as part of the Contract unless Internet broadband connectivity, via Cable or DSL, is available at the planned field office location. Any questions regarding this policy should be directed to the Assistant Commissioner of ITS at 718-391-1761.

E. HEAD PROTECTION (HARD HATS):

1. The Contractor must provide a minimum of ten (10) standard protective helmets for the exclusive use of DDC personnel and their visitors. Helmets must be turned over to the Resident Engineer and kept in the DDC Field Office.

2. Upon completion of the Project, the helmets must become the property of the Contractor.

F. PAYMENT FOR DDC FIELD OFFICE

1. The DDC Field Office will be paid monthly on a unit price basis.

2. MEASUREMENT. The quantity to be measured for payment under this item will be the number of months that the DDC Field Office is available for occupancy by the Commissioner during the period of the Project. Payment will begin the first month that the DDC Field Office is fully equipped, serviced

as specified, and made available for occupancy. The DDC Field Office is to be continuously made available and monthly payments will continue for the duration of the Project through a period not to exceed 6 months past the Substantial Completion date. When directed in writing by the Commissioner, the DDC Field Office will be provided and paid for a period of time beyond 6 months past the Substantial Completion date. Payment for each month's occupancy after the date of Substantial Completion acceptance will be made as part of the final payment. Monthly payments may be terminated on a specified date prior to acceptance of the Project by written notification by the Commissioner that such office will no longer be required on the Project.

3. PRICE TO COVER. The unit price bid per month for the item DDC Field Office shall include the cost of furnishing all labor, materials, equipment, ground rental, fire and theft insurance, and utility charges necessary to complete the work of providing or constructing the field office; making all necessary electrical, water, sewer, and other connections required to make the above facilities operative; payment of all rental costs; furnishing and paying for heating fuel, as required; all electrical energy; private telephone services; staples, as specified; and all necessary incidentals to complete the work all in accordance with the specifications and the directions of the Commissioner.

3.9 MATERIAL SHEDS:

A. Material sheds used by the Contractor for the storage of its materials must be kept at locations which will not interfere at any time with the progress of any part of the Work or with visibility of traffic control devices.

B. The Contractor must store combustible materials apart from the facility.

3.10 TEMPORARY ENCLOSURES:

A. The Contractor must provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.

B. Where heating or cooling is needed and Permanent Enclosure is not complete, the Contractor must insulate temporary enclosures.

3.11 TEMPORARY PARTITIONS:

A. The Contractor must provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate occupied tenant areas from fumes and noise, including, but without limitation:

1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
2. Construct dustproof partitions with 2 layers of 3-mil (0.07-mm) polyethylene sheet on each side. Cover floor with two (2) layers of 3-mil (0.07-mm) polyethylene sheet, extending sheets eighteen (18) inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant plywood.
    a. Construct vestibule and airlock at each entrance through temporary partition with not less than forty-eight (48) inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.
3. Insulate partitions to provide noise protection to occupied areas.
4. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
5. Protect air-handling equipment.
6. Weather strip openings.

7. Provide walk-off mats at each entrance through temporary partition.

3.12 TEMPORARY FIRE PROTECTION:

A. The Contractor must install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with National Fire Protection Association (NFPA) Standard 241.

B. Smoking in all areas is prohibited.

C. The Contractor must supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.

D. The Contractor must develop and supervise an overall fire-prevention and protection program for personnel at Project Site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

E. The Contractor must provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.13

3.13 WORK FENCE ENCLOSURE:

A. The Contractor must furnish, erect and maintain a wood construction or chain-link fence to the extent shown on the Contract Drawings or required by the Work enclosing the entire Project on all sides. All materials used must be new. Any permit required for the installation and use of said fence and costs must be borne by the Contractor.

B. WOOD FENCE must be seven (7) feet high with framing construction of yellow pine, using 4" x 4" approved preservative-treated posts on not more than 6'-0" centers, with three (3) rails of at least 2" x 4" size to which must be secured minimum 1/2 inch thick exterior grade plywood. Posts must be firmly fixed in the ground at least 30" and thoroughly braced. Top edge of fence must be trimmed with a rabbeted edge mould. Provide on the street traffic sides of fence, observation openings as directed.

1. GATES: The Contractor must provide an adequate number of double gates, complete with hardware, located as approved by the Resident Engineer. Double gates must have a total clear opening of 14'-0" with two (2) 7'-0" hinged swinging sections. Hanging posts must be 6" x 6" and must extend high enough to receive and be provided with tension or sag rods for the swinging sections.

2. PAINTING: The fence and gates must be entirely painted on the street and public sides with one (1) coat of exterior primer and one (1) top coat of exterior grade acrylic-latex emulsion paint. Black stenciled signs reading "POST NO BILLS" must be painted on fence with three (3) inch high letters on twenty-five (25) foot spacing for the entire length of fence on street traffic sides. Signs must be stenciled five (5) feet above the sidewalk.

C. CHAIN-LINK FENCING must be minimum two (2) inch thick, galvanized steel, chain-link fabric fencing; eight (8) feet high with galvanized steel pipe posts; minimum 2-3/8-inch Outside Diameter (OD) line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Fence must be accurately aligned and plumb, adequately braced and complete with gates, locks and hardware as required. Under no condition must fencing be attached or anchored to existing construction or trees.

D. ADDITIONAL REQUIREMENTS:

1. It must be the obligation of the Contractor to remove all posters, advertising signs, and markings, etc., immediately.

2. Should the fencing be required to be relocated during the course of the Contract, it must be done by

the Contractor at no additional cost to the City.

3. Where sidewalks are used for "drive over" purposes for Contractor vehicles, a suitable wood mat or pad must be provided for protection of sidewalks and curbs.

4. Where required, make provision for fire hydrants, lampposts, etc.

E. REMOVAL: When directed by the Commissioner, the fence must be removed.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.14

3.14 RODENT AND INSECT CONTROL:

A. DESCRIPTION: The Contractor must provide all labor, materials, plant and equipment, and incidentals required to survey and monitor rodent activity and to control any infestation or outbreak of rodents, rats, mice, water beetles, roaches and fleas within the Project area. Special attention should be paid to the following conditions or areas:

1. Wet areas within the Project area, including all temporary structures.

2. All exterior and interior temporary toilet structures within the Project area.

3. All Field Offices and shanties within the Project area of all Subcontractors and DDC.

4. Wherever there is evidence of food waste and/or discarded food or drink containers, in quantity, that would cause breeding of rodents or the insects herein specified.

5. Any other portion of the Site requiring such special attention.

B. MATERIALS:

1. All materials must be approved by the New York State Department of Environmental Conservation (DEC) and comply with the New York City Health Code, OSHA and the laws, ordinances and regulations of state and federal agencies pertaining to such chemical and/or materials.

C. PERSONNEL:

1. All pest control personnel must be supervised by an exterminator licensed in categories 7A and 8.

D. METHODS:

1. Application and dosage of all materials must be done in strict compliance with the manufacturer’s recommendations.

2. Any unsanitary conditions, such as uncollected garbage or debris, resulting from all Contractor’s activities, which will provide food and shelter to the resident rodent population must be corrected by the Contractor immediately after notification of such condition by the Resident Engineer.

E. RODENT CONTROL WORK:

1. In wetlands, woodlands, and areas adjacent to a stream, special precautions must be taken to protect water quality and to ensure the safety of other wildlife. To prevent poisoned bait from entering streams, no poisoned bait must be used in areas within seventy-five (75) feet of all stream banks. Live traps must be used in these seventy-five (75) foot buffer zone areas and within wetland and woodland areas.

2. In areas outside the seventy-five (75) foot zone of protection adjacent to streams, and in areas outside wetlands and woodlands, tamper proof bait stations with poisoned bait must be placed during the period of construction and any consumed or decomposed bait must be replenished as directed.

3. At least one (1) month prior to initiation of the construction Work, and periodically thereafter, live traps and/or rodenticide bait in tamper proof bait stations, as directed above, must be placed at locations that do not allow access to pets, human beings, children and other non-target species, particularly wildlife (for example-birds) in the Project area.

4. The Contractor must be responsible for collecting and disposing of all trapped and poisoned rodents found in live traps and tamper-proof bait stations. The Contractor must also be responsible for posting and maintaining signs announcing the baiting of each particular location.

5. The Contractor must be responsible for the immediate collection and disposal of any visible rodent remains found on streets or sidewalks within the Project area.

6. It is anticipated that public complaints will be addressed to the Commissioner. The Contractor, where directed by the Commissioner, must take appropriate actions, like baiting, trapping, proofing, etc., to remedy the source of complaint within the next six (6) hours of normal working time which is defined herein for the purposes of this section as 7 A.M. to 6 P.M. on Mondays through Saturdays.

7. Emergency service during the regular workday hours (Monday through Friday) must be rendered within twenty-four (24) hours, if requested by the Commissioner, at no additional cost to the City.

F. EDUCATION & NOTICES:

1. The Contractor must post notices on all Construction Bulletin Boards advising workers, employees, and residents to call the DDC Field Office to report any infestation or outbreak of rodents, rats, mice, water beetles, roaches and fleas within the Project area. The Contractor must provide and distribute literature pertaining to Integrated Pest Management (IPM) techniques of rodent control to affected businesses and superintendents of nearby residential buildings to ensure their participation in maintaining their establishments free of unsanitary conditions, harborage removal and rodent proofing.

2. Prior to application of any chemicals, the Contractor must furnish to the Commissioner copies or sample labels for each pesticide, antidote information, and Material Data Safety Sheets (MSDS) for each chemical used.

G. RECORDS

1. The Contractor must keep a record of all rodent and waterbug infestation surveys conducted and make available, upon request, to the Commissioner. The findings of each survey must include, but not be limited to, recommended IPM techniques, like baiting, trapping, proofing, etc., proposed for rodent and waterbug pest control.

2. The Contractor must maintain records of all locations baited along with the type and quantity of rodenticide and insecticide bait used, using the NYC Pesticide Use Reporting System (“NYCPURS”). These records will be kept by the Commissioner. A weekly report from NYCPURS must be prepared, signed and certified by the approved licensed exterminator retained by the Contractor. Such reports must be submitted to the Commissioner each week, prior to payment.

H. PAYMENT FOR RODENT AND INSECT CONTROL

1. Payment for rodent and inspect control will be made on a unit price basis.

2. The quantity to be measured for payment under this item will be the number of months (to the nearest 1/4 month increment) that the Contractor satisfactorily provides for rodent and insect

control in accordance with these specifications.

3. The unit price bid per month for rodent and insect control must include the cost of furnishing all labor, materials, plant, equipment, insurance and incidentals required to provide rodent and insect control, all in accordance with the Contract Drawings, these specifications, and the directions of the Commissioner.

3.15 PLANT PEST CONTROL REQUIREMENTS AND TREE PROTECTION REQUIREMENTS:

A. Plant Pest Control Requirements: The Contractor and its Subcontractors, including the Certified Arborist described below, must comply with all federal and New York State laws and regulations concerning Asian Longhorned Beetle (ALB) management, including protocols for ALB eradication and containment promulgated by the New York State Department of Agriculture and Markets (NYSDAM). The Contractor is referred to: (1) Part 139 of Title 1 NYCRR, Agriculture and Markets Law, Sections 18, 164 and 167, as amended, and (2) State Administrative Procedure Act, Section 202, as amended.

1. All tree Work performed within the quarantine areas must be performed by NYSDAM certified entities. Transportation of all host material, living, dead, cut or fallen, inclusive of nursery stock, logs, green lumber, stumps, roots, branches and debris of a half inch or more in diameter from the quarantine areas is prohibited unless the Contractor or its Subcontractor performing tree Work has entered into a compliance agreement with NYSDAM. The terms of said compliance agreement must be strictly complied with. Any host material so removed must be delivered to a facility approved by NYSDAM. For the purpose of this Contract, host material must be ALL species of trees.

2. Any host material that is infested with the ALB must be immediately reported to NYSDAM for inspection and subsequent removal by either State or City contracts, at no cost to the Contractor.

3. Prior to commencement of tree Work, the Contractor must submit to the Commissioner a copy of a valid ALB compliance agreement entered into with NYSDAM and the Contractor or its Subcontractor performing tree Work. If any host material is transported from the quarantine area the Contractor must immediately provide the Commissioner with a copy of the New York State 'Statement of Origin and Disposition' and a copy of the receipt issued by the NYSDAM approved facility to which the host materials are transported.

4. Quarantine areas, for the purpose of this Contract, must be defined as all five boroughs of the City of New York. In addition, prior to the start of any tree Work, the Contractor must contact the NYC Department of Parks & Recreation's (DPR) Director of Landscape Management at (718) 699-6724, to determine the limits of any additional quarantine areas that may be in effect at the time when tree Work is to be performed. The quarantine area may be expanded by federal and state authorities at any time and the Contractor is required to abide by any revisions to the quarantine legislation while working on this Contract. For further information please contact: NYSDAM (631) 288-1751.

B. Tree Protection Requirements: The Contractor must retain a Certified Arborist, as defined by DPR regulations, to provide the services described below.

1. Surveys and Reports: The Certified Arborist must, at the times indicated below, conduct a survey and prepare a plant material assessment report which includes: (1) identification, by species and pertinent measurements, of all plant material located on the Project Site, or in proximity to the Project Site, as described below, including all trees, significant shrubs and/or planting masses; (2) identification and plan for the containment of plant pests and pathogens, including the ALB, as described in paragraph A above; and (3) evaluation of the general health and condition of any infected plant material.

2. Frequency of Reports: The Certified Arborist must conduct a survey and provide a plant material assessment report at two (2) points in time: (1) prior to the commencement of construction Work; and (2) at the time of Substantial Completion. In addition, for projects exceeding twenty-four (24) months in duration, the Certified Arborist must conduct a survey and prepare a report at the midpoint of

construction. Copies of each plant material assessment report must be submitted to the Resident Engineer within two (2) weeks of the survey.

3. Proximity to Project Site: Off-site trees, significant shrubs and/or planting masses must be considered to be located in proximity to the Project Site under the circumstances described below.

   a. The tree trunk, significant shrub, or primary cluster of stems in a planting mass is within fifty (50) feet of the project's Contract Limit Lines (CLLs) or Property Lines (PLs).

   b. Any part of the tree or shrub stands within fifty (50) feet of: (a) a path for Site access for vehicles and/or construction equipment; or (b) scaffolding to be erected for construction activity, including façade remediation projects.

   c. The Certified Arborist determines that the critical root zone (CRZ) of an off-site tree, significant shrub, or primary cluster of stems in a planting mass extends into the Project Site, whether or not that plant material is located within the fifty (50) foot inclusionary perimeter as outlined above.

4. Tree Protection Plan: The Certified Arborist must prepare, and the Contractor must implement, a Tree Protection Plan for all trees that may be affected by any construction Work, excavation or demolition activities, including without limitation: (1) on-site trees, (2) street trees, as defined below, (3) trees under DPR jurisdiction as determined by the NYC Department of Transportation, and (4) all trees that are located in proximity to the Project Site, as defined above. The Tree Protection Plan must comply with the DPR rules, regulations and specifications. The Contractor is referred to Chapter 5 of Title 56 of the Official Compilation of the Rules of the City of New York. Copies of the Tree Protection Plan must be submitted to the Resident Engineer prior to the commencement of construction. Implementation of the Tree Protection Plan for street trees and trees under DPR jurisdiction must be in addition to any tree protection requirements specified or required for the Project Site. For the purpose of this article, a "street tree" means the following: (1) a tree that stands in a sidewalk, whether paved or unpaved, between the curb lines or lateral lines of a roadway and the adjacent property lines of the Project Site, or (2) a tree that stands in a sidewalk and is located within fifty (50) feet of the intersection of the Project's Site's PL with the street frontage property line.

C. No Separate Payment: No separate payment must be made for compliance with Plant Pest Control Requirements or Tree Protection Requirements. The cost of compliance with Plant Pest Control Requirements and Tree Protection Requirements must be deemed included in the Contractor's bid for the Project.

3.16 PROJECT IDENTIFICATION SIGNAGE:

A. The Contractor must provide, install and maintain Project identification and other signs where indicated to inform public and individuals seeking entrance to the Project.

B. In order to properly convey notice to persons entering upon a City construction Site, the Contractor must furnish and install a sign at the entrance (gates) as follows:

NO TRESPASSING

AUTHORIZED PERSONNEL ONLY

C. If no construction fence exists at the Site, this notice must be conveyed by incorporating the above language into safety materials (barriers, tape, and signs).

D. Provide temporary, directional signs for construction personnel and visitors.

E. Maintain and touch up signs so that they are legible at all times.

3.17 PROJECT CONSTRUCTION SIGN AND RENDERING:

A. PROJECT SIGN:

1. Responsibility: The Contractor must produce and install one (1) Project sign which must be posted and maintained upon the Project Site at a place and in a position directed by the Commissioner. The Contractor must protect the sign from damage during the continuance of Work under the Contract and must do all patching of lettering, painting and bracing thereof necessary to maintain the sign in first class condition and in proper position. Prior to fabrication, the Contractor must submit an 8-1/2" x 11" color match print proof from the sign manufacturer of the completed sign for approval by the Commissioner.

2. Sign Quality: The Contractor must provide all materials required for the production of the sign as specified herein. Workmanship must be of the best quality, free from defects and must be produced in a timely manner.

3. Schedule: Upon Project mobilization, the Contractor must commence production and installation of the sign.

4. Removal: At the completion of all Work under the Contract, the Contractor must remove and dispose of the Project sign away from the Site.

5. Sign construction:

   a. Frame: The frame must be from quality dressed 2"x2" pine, fire retardant, pressure treated lumber, that surrounds the inside back edge of the sign. The sign must have one (1) intermediate vertical and two (2) diagonal supports, glued and screwed for rigidity. Frame must be painted white with two (2) coats of exterior enamel paint, prior to mounting of sign panel.

   b. Edging: U-shaped, twenty-two (22) gauge aluminum edging, with a white enameled finish to match sign background, must run around entire edging of sign panel and frame. Corners must be mitered for a tight fit. Channel dimensions must be 1" inch (overlap to sign panel face) x 1 3/4" (or as required across frame depth) x 1" (back overlap).

   c. Sign Panel: 4' x 8' panel must be constructed in one (1) piece of fourteen (14) gauge (.0785") 6061-T6 aluminum. This panel must be pre-finished both sides with a glossy white baked-on enamel finish and be flush with edge of 2" x 2" wood frame. Samples must be submitted for approval.

   d. Fastening: Fasten sign panel to wood frame using cadmium plated no. 8 sheet metal screws at ½" below edge of panel and 8" on center. The U-shaped aluminum channel must be applied over the wood frame edge and fastened with cadmium plated no. 8 sheet metal screws at 12" on center around the entire perimeter.

6. Sign Graphics:

   a. A digital file of the Project sign will be provided to the Contractor by the Commissioner's representative for printing. The Commissioner's representative must insert the Project name and names and titles of personnel (three (3) or more) and any other required information associated with the Project. All signs may include a second panel for a Project rendering as described in sub-section 3.17.B herein.

   b. The digital file must be reproduced at the Sign Panel size of 4' x 8' on 3M High Performance Vinyl or approved equal. The 3M High Performance Vinyl or equivalent must be guaranteed for nine (9) years. Guarantee must cover fading, peeling, chipping or cracking. The sign manufacturer is

required to maintain all specified Pantone Matching System (PMS) type and other composition elements represented in the digital file of the Project sign.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SETION 3.17 B

B. PROJECT RENDERING:

1. Responsibility: In addition to the Project sign, the Contractor must furnish and install one (1) sign showing a rendering of the Project. A digital file of the Project rendering will be provided to the Contractor by the Commissioner's representative. From an approved image file provided by DDC, the Project rendering is to be sized, printed, and mounted in an identical manner as described in sub-section 3.17.A above for the Project sign. A color match print proof from the sign manufacturer of the rendering sign printed from the supplied file is to be submitted to DDC for approval before fabrication. The rendering sign is to be posted at the same height as the Project sign. Where possible, the rendering sign must be mounted with a perfect match of the short sides of the rectangle so that the rendering sign and the Project sign together will create one long rectangle.

2. Removal: At the completion of all Work under the Contract, the Contractor must remove and dispose of the Project rendering away from the Site.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.18

3.18 SECURITY GUARDS/FIRE GUARDS ON SITE:

A. SECURITY GUARDS (WATCHMEN):

1. The Contractor must provide a competent security guard service on the Site, beginning on the date on which the Contractor commences actual construction Work, or on such earlier date on which there is activity at the Site related to the Work, including without limitation, delivery of materials or construction set-up. The Contractor must continue to provide such security guard service until the date on which it completes all required Work at the Site, including all punch list Work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. Throughout the specified time period, there must be no less than one (1) security guard on duty every day, including Saturdays, Sunday and holidays, twenty-four (24) hours a day, except between the hours of 8:00 A.M. and 4:00 P.M. on any day that the Contractor is present. This exception during the working day must not apply after the finishing painting of the plaster Work is commenced; thereafter, not less than one (1) security guard must be on duty continuously, twenty-four (24) hours a day.

2. Every security guard must be required to hold a "Certificate of Fitness" issued by FDNY. Every security guard must, during his/her tour of duty, perform the duties of fire guard in addition to his/her security obligations.

3. Should the Commissioner find that any security guard is unsatisfactory, such guard must be replaced by the Contractor upon the written demand of the Commissioner.

4. Each security guard furnished by the Contractor must be instructed by the Contractor to include in his/her duties the entire construction Site including the Field Office, temporary structures, and equipment, materials, etc.

5. Should the Contractor or any other Subcontractor consider the security requirements outlined above inadequate, the Contractor must provide such additional security as it thinks necessary, after obtaining the written consent of the Commissioner. The additional cost of such approved increased protection will be paid by the Contractor.

6. Nothing contained in this sub-section must diminish in any way the responsibility of the Contractor and each Subcontractor for its own Work, materials, tools, equipment, nor for any of the other risks and obligations outlined hereinbefore in this Article.

B. COSTS: The Contractor must employ security guards/fire guards throughout the specified time period, except as otherwise modified by the detailed Specifications and as approved by the Commissioner, for the purpose of safeguarding and protecting the Site. All costs for security guards/fire guards must be borne by the Contractor.

C. RESPONSIBILITY: The Contractor and its Subcontractors will be responsible for safeguarding and protecting their own work, materials, tools and equipment.

D. PAYMENT FOR SECURITY GUARDS

1. Payment for security guards will be made on a unit price basis.

2. The quantity to be measured for payment under this item will be the number of months (to the nearest 1/4 month increment) that the Contractor satisfactorily provides for security guards in accordance with these specifications.

3. The unit price bid per month for security guards must include the cost of furnishing all labor, materials, plant, equipment, insurance and incidentals required to provide security guards, all in accordance with the Contract Drawings, these specifications, and the directions of the Commissioner.

3.19 SAFETY:

A. The Contractor, in compliance with requirements of Section 01 35 26, SAFETY REQUIREMENTS PROCEDURES, must provide and maintain all necessary temporary closures, guard rails, and barricades to adequately protect all workers and the public from possible injury. Any removal of these items, during the progress of the Work, must be replaced by the Contractor at no additional cost to the City.

END OF SECTION 01 50 00

SECTION 01 54 11
TEMPORARY ELEVATORS AND HOISTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:
   1. Temporary Use, Operation and Maintenance of Elevators during Construction
      a. For new buildings up to and including fifteen (15) stories
      b. For new buildings over fifteen (15) stories
      c. For existing buildings
   2. Temporary Construction Hoists and Hoistways (For Material and Personnel)

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY

B. Section 01 42 00 REFERENCES

C. Section 01 50 00 TEMPORARY FACILITIES AND CONTROLS

D. Section 01 54 23 TEMPORARY SCAFFOLDS AND SWING STAGING

E. Section 01 77 00 CLOSE OUT PROCEDURES

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.1

3.1 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR NEW BUILDINGS UP TO AND INCLUDING FIFTEEN (15) STORIES:

A. INSTALLATION: The Contractor must install, complete, operate, and maintain in good working order, as indicated herein, one (1) selected main elevator for the transport of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of Work at the Project. The Contractor must furnish, install, and maintain such elevator in good working order, including all necessary hoisting ropes, governor cables, traveling conductor cables, operating devices, temporary hand reset target annunciators, temporary signal devices, and all other permanent or temporary parts. The installation, operation and maintenance of the temporary elevator and all equipment and/or parts utilized in connection therewith must be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use.

B. RESPONSIBILITY: The Contractor must be responsible for any injury to persons or damage to property arising out of the temporary elevator and all equipment and/or parts utilized in connection therewith.

C. COSTS: The Contractor must be responsible for all costs in connection with the temporary elevator, including without limitation:

1. Installing and operating the temporary elevator;
2. Maintaining the temporary elevator in clean and proper operating condition, including the cost of lubricants and/or parts for such maintenance;
3. Performing all Work in pits, shaft ways and machine rooms necessary for the operation of the temporary elevator;
4. Replacing the temporary elevator or any equipment or parts utilized in connection therewith, if required, due to damage, destruction, or excessive wear or corrosion, except for the replacement of hoisting ropes as set forth below;
5. Performing all required electrical Work in connection with the temporary elevator;
6. Providing all electric power required to operate the temporary elevator;
7. Providing all necessary conduit and wiring connections for the proper operation and signaling of the temporary elevator; and
8. Providing all labor for the operation and maintenance of the temporary elevator, including on an overtime basis if necessary.

The total Contract price must include all costs in connection with the temporary elevator, including without limitation, the costs specified herein.

D. COMMENCEMENT OF SERVICE: The Contractor must begin to provide temporary elevator service using the selected main passenger elevator no later than eight (8) weeks (forty (40) Days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed. No later than three (3) weeks (fifteen (15) Days) after the machine room roof slab has been placed, or that portion of it surrounding the elevator shaft, the following Work must be completed:

1. The shaft must be completely enclosed by either a permanent or temporary enclosure meeting all building code requirements.
2. The machine room must be completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary, must be provided to enable the safe and practicable hoisting of the elevator machinery for installation.
3. On all floors at the shaft way entrances to the elevator, the Contractor must install solid substantial frames, either sliding or swing doors with substantial hardware and door locks, and any necessary approved wire mesh barricades for adjacent shaft ways.
4. The Contractor must furnish and install solid, substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at the top of car and a substantial temporary door or gate on the front of the elevator entrance.

E. ELECTRICAL INSTALLATION: The Contractor, no later than twenty (20) Days after the machine room roof slab or that portion of it surrounding the elevator has been placed, must furnish and install temporary or permanent power and light feeders as required for the elevator used for temporary service. Additionally, the Contractor must connect such feeders to the terminals on the starter panels or controllers in the machine room to the low voltage transformers and car light outlets in the center of the shaft way and for the car control and signal traveling cables. The Contractor must make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.

F. REMOVAL: As directed by the Commissioner and when elevators for permanent use have been installed and are in proper condition for service, the Contractor must remove the temporary enclosures and all temporary elevator equipment and promptly proceed with the installation of the permanent equipment as required under the Contract.

G. INSPECTION: Before temporary elevator equipment is removed, a joint inspection of the equipment must be made by the Contractor and the Commissioner to determine the condition of this equipment upon the discontinuation of its temporary use. If this inspection deems it necessary, the Contractor must furnish and install new governor and compensating ropes, traveling cables, controller parts, etc. The car and counterweight safeties must be thoroughly cleaned of all dirt and all foreign matter, then properly lubricated and placed in good operating condition to the satisfaction of the Commissioner. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes must be installed and payment will be made in accordance with Article 26 of the Contract.

H. REPLACEMENT: The Contractor must furnish and install new equipment or parts for any equipment or parts of the temporary elevator installation that have been damaged, destroyed, or that indicate excessive wear or corrosion, except for the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheave spaces used for temporary operation of elevators must be thoroughly cleaned. Where lubricated rails are used they must be washed down. If roller guides are used, all rust, dirt, etc., must be moved from the rails. The full cost of parts replacement, cleaning, etc., must be borne by the Contractor except for the replacement of hoisting ropes.

I. LIMITATIONS ON USE: The temporary elevator must not be used during its operation for the hoisting of materials or the removal of rubbish, but must be limited only to the transportation of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of work at the Project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its Subcontractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation. In the event of any damage to the temporary elevator, the Contractor must notify the Resident Engineer within twenty-four (24) hours after such damage has occurred. As indicated above, the Contractor must be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.

J. LIQUIDATED DAMAGES: The Contractor will be charged at the rate of one hundred dollars ($100) per Day for each Day it fails to provide the temporary elevator service described in this section beginning with the forty-first (41st) Day after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed and stripped. This charge will be deducted from any amount due and owing to the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2

3.2 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR NEW BUILDING OVER FIFTEEN (15) STORIES:

A. INSTALLATION: The Contractor must install, complete, operate, and maintain in good working order, as indicated herein, two (2) selected main elevators for the transport of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of work at the Project. The Contractor must furnish, install, and maintain such elevators in good working order, including all necessary hoisting ropes, governor cables, traveling conductor cables, operating devices, temporary hand reset target annunciators, temporary signal devices, and all other permanent or temporary parts. The installation, operation, and maintenance of the temporary elevators and all equipment and/or parts utilized in connection therewith must be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use. The two (2) elevators must not be operated simultaneously.

B. RESPONSIBILITY: The Contractor must be responsible for any injury to persons or damage to property arising out of the temporary elevators and all equipment and/or parts utilized in connection therewith.

C. COSTS: The Contractor must be responsible for all costs in connection with the temporary elevators, including without limitation:

1. Installing and operating the temporary elevators;

2. Maintaining the temporary elevators in clean, proper operating condition, including the cost of lubricants and/or parts for such maintenance;

3. Performing all Work in pits, shaft ways and machine rooms necessary for the operation of the temporary elevators;

4. Replacing the temporary elevators or any equipment or parts utilized in connection therewith, if required due to damage, destruction, or excessive wear or corrosion, except for the replacement of hoisting ropes as set forth below;

5. Performing all required electrical Work in connection with the temporary elevators;

6. Providing all electric power required to operate the temporary elevators;

7. Providing all necessary conduit and wiring connections for the proper operation and signaling of the temporary elevators; and

8. Providing all labor for the operation and maintenance of the temporary elevators, including on an overtime basis if necessary.

The total Contract price must include all costs in connection with the temporary elevators, including without limitation, the costs specified herein.

D. LOW RISE ELEVATOR: The Contractor must begin to provide temporary elevator service using one (1) selected main passenger elevator no later than six (6) weeks (thirty (30) Days) after the twelfth (12th) floor slab, or that portion of it surrounding the elevator shaft, has been placed and stripped. No later than one (1) week, (five (5) Days), after the twelfth (12th) floor slab, or that portion of it surrounding the elevator shaft, has been placed and stripped, the following Work must have been completed:

1. The shaft must be completely enclosed up to the twelfth (12th) floor by either the permanent or a temporary enclosure meeting the requirements of the law.

2. A temporary machine room enclosure must be provided at the eleventh (11th) floor and must be completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary, must be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.

3. The Contractor must install on all floors up to and including the ninth (9th) floor at the shaft entrances to the elevator, solid substantial wood frames, either sliding or swing doors with substantial hardware and door locks, and any necessary approved wire mesh barricades for adjacent shaft ways.

4. The Contractor must furnish and install solid substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at top of car, except that the portion of the front at the elevator entrance must be provided with a substantial temporary door or gate.

E. ELECTRICAL INSTALLATION: The Contractor must, no later than ten (10) Days after the twelfth (12th) floor slab or that portion of it surrounding the elevator has been poured and stripped, furnish and install temporary or permanent power and light feeders as required for the elevator used for temporary service. The Contractor must connect such feeders to the terminals on the starter panels or controllers in the temporary machine room to the low voltage transformers, car light outlets in the center of the shaftway, and for the car control and signal traveling cables. The Contractor must make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.

F. HIGH RISE ELEVATOR: The Contractor must begin to provide temporary elevator service to all floors using a selected main passenger elevator no later than eight (8) weeks (forty (40) Days) after the machine room roof slab, or that portion of it surrounding the elevator shaft has been placed. No later than three (3) weeks (fifteen (15) Days) after the machine room roof slab, or that portion of it surrounding the elevator shaft has been placed, the following Work must have been completed:

1. The shaft must be completely enclosed by either the permanent or temporary enclosure, meeting the

requirements of the law.

2. The machine room must be completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary, must be provided to enable the safe and practicable hoisting of the elevator machinery for installation.

3. The Contractor must install on all floors at the shaft way entrances to the elevator solid substantial frames, either sliding or swing doors with substantial hardware and door locks, and any necessary approved wire mesh barricades for adjacent shaft ways.

4. The Contractor must furnish and install solid substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at top of car, except that the portion of the front at the elevator entrance must be provided with a substantial temporary door or gate.

G. ELECTRICAL INSTALLATION: The Contractor must, not later than twenty (20) Days after the machine room slab or that portion of it surrounding the elevator shaft has been placed, furnish and install temporary or permanent power and light feeders as required for the high-rise elevator to be used for temporary service. The Contractor must connect such feeders to the terminals on the motor-generator starter panels, or controllers in the machine room, to the signal circuits low voltage transformers for the annunciators and car light outlets in the center of shaft way. The Contractor must make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.

H. When the high-rise elevator is completed and ready for temporary operation, the low-rise temporary elevator must be shut down.

I. REMOVAL: When directed by the Commissioner and one (1) or more elevators for permanent use have been installed and are in condition for service, the Contractor must remove the temporary enclosures, all temporary elevator equipment, and promptly proceed with the installation of the permanent equipment as required under the Contract.

J. INSPECTION: Before temporary elevator equipment is removed, a joint inspection of the equipment must be made by the Contractor and the Commissioner to determine the condition of this equipment upon the discontinuation of its temporary use. If this inspection determines it necessary, the Contractor must furnish and install new governor and compensating ropes, new traveling cables, new controller parts, etc. The car and counterweight safeties must be thoroughly cleaned of all dirt and all foreign matter, then properly lubricated and placed in good operating condition to the satisfaction of the Commissioner. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes must be installed and payment will be made in accordance with Article 26 of the Contract.

K. REPLACEMENT: The Contractor must furnish and install new equipment or parts for any equipment or parts of the temporary elevator installations that have been damaged, destroyed, or that indicate excessive wear or corrosion, except the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheaves spaces used for temporary operation of elevators must be thoroughly cleaned down. Where lubricated rails are used they must be washed down; if roller guides are used, all rust, dirt, etc., must be removed from the rails. The full cost of parts replacement cleaning, etc., must be borne by the Contractor except for the replacement of hoisting ropes.

L. LIMITATIONS ON USE: The temporary elevators must not be used during their operation for the hoisting of materials or the removal of rubbish, but must be limited only to the transportation of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of Work at the Project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its Subcontractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation, but only after such times as all plastering has been completed from the second floor up. In the event of any damage to the temporary elevator, the Contractor must notify the Resident Engineer within twenty-four (24) hours after such damage has occurred. As indicated above, the Contractor must be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.

M. LIQUIDATED DAMAGES: The Contractor will be charged at the rate of one hundred dollars ($100) per Day for each Day it fails to provide the temporary elevator service described in this Section beginning with the thirty-first (31st) Day after the twelfth (12th) floor slab, or that portion of the twelfth (12th) floor slab surrounding the elevator shaft, has been placed and stripped. This charge will be deducted from any amount due and owing to the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR EXISTING BUILDINGS:

A. The Contractor may use, at the Commissioner's discretion, one (1) selected elevator in the building for temporary operation by the Contractor for the transportation of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction over the Work at the Project. The operation of the temporary elevator and all equipment and/or parts utilized in connection therewith must be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use.

B. RESPONSIBILITY: The Contractor must be responsible for any injury to persons or damage to property arising out of the temporary elevator and all equipment and/or parts utilized in connection therewith.

C. REPLACEMENT: The Contractor must furnish and install new equipment or parts for any equipment or parts of the elevator for temporary operation that have been damaged, destroyed, or that indicate excessive wear or corrosion, except the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheave spaces used for temporary operation of elevators must be thoroughly cleaned down. Where lubricated rails are used they must be washed down, if roller guides are used, all rust, dirt, etc., must be moved from the rails. The full cost of parts replacement, cleaning, etc., must be borne by the Contractor except for the replacement of hoisting ropes. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes must be installed and payment will be made in accordance with Article 26 of the Contract.

D. LIMITATIONS ON USE: The temporary elevator must not be used during its operation for the hoisting of materials or the removal of rubbish, but must be limited only to the transportation of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of Work at the Project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its Subcontractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation. In the event of any damage to the temporary elevator, the Contractor must notify the Resident Engineer within twenty-four (24) hours after such damage has occurred. As indicated above, the Contractor must be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.

E. LIQUIDATED DAMAGES: The Contractor will be charged at the rate of one hundred dollars ($100) per Day for each Day it fails to provide elevator services described in this section beginning with fifteen (15) Days from Notice to Proceed (NTP). This charge will be deducted from any amount due and owing to the Contractor.

3.4 TEMPORARY HOISTS AND HOISTWAYS (FOR MATERIAL AND PERSONNEL):

A. RESPONSIBILITY: The Contractor must provide adequate numbers of material hoists for the most expeditious performance of all parts of the Work including the Work of all its Subcontractors.

B. LOCATIONS: No hoists must be constructed at such locations as to interfere with, or affect the construction of, floor arches or the Work of Subcontractors. The hoists may be located at the exterior sides of the structure or in the courtyard and extend upward adjacent to the line of window openings. The hoists must be located a sufficient distance from the exterior walls and be so protected as to prevent any of the permanent Work from being damaged, stained or marred.

C. ELEVATOR SHAFT: Wherever possible, one or more of the permanent elevator shafts may be used as temporary hoistways, providing such use complies with the requirements of the Building Code of the City of New York, has been approved by the Commissioner, and does not interfere with the progress of the Work.

D. PROTECTION FOR INTERIOR HOISTS: All interior material hoistways must be enclosed on each floor and must be adequately protected with appropriate safety guards. In no event must the protection be less than that required by law.

END OF SECTION 01 54 11

SECTION 01 54 23
TEMPORARY SCAFFOLDING AND PLATFORMS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. Section 01 35 26 SAFETY REQUIREMENTS PROCEDURES.

C. The Contractor must comply with the requirements of "*The City of New York Department of Design and Construction Safety Requirements".* This document is included in the Information for Bidders.

1.2 SUMMARY:

A. This Section includes administrative and general procedural requirements for Temporary Scaffolding and Platforms, including:

1. Conformance
2. Responsibility
3. Jobsite Documentation and Submittals
4. Inspections

B. This Section governs ALL scaffold used on DDC Project site(s), including but not limited to, Suspended Scaffold, Supported Scaffold, and Sidewalk Sheds.

1.3 CONFORMANCE:

A. Unless otherwise indicated, the Contractor is responsible for providing, erecting, installing, and maintaining all temporary scaffolding and platforms which must comply with requirements of Chapter 33 (Safeguards During Construction or Demolition) of the New York City (NYC) Building Code, NYC Local Law 52 of 2005, OSHA Construction Standard 1926 Subpart L, and furnishing the items and personnel set forth in this Section.

1.4 RESPONSIBILITY:

A. Jobsite Safety Coordinator: The Contractor must designate and employ a Jobsite Safety Coordinator, who must be a competent person, who must have a daily presence on the Project site during scaffold use. This designee must possess and maintain a valid New York City Department of Buildings (DOB) supported scaffold certificate of completion. An alternate must also be designated in the event that the Jobsite Safety Coordinator is absent. The Jobsite Safety Coordinator must:

1. Verify completeness of documentation and submittals (as described below);
2. Verify that inspections are performed, including pull tests (see below), reports are filed and reported deficiencies are corrected;
3. Monitor trades using scaffold;
4. Limit access to scaffold areas that are tagged for non-use;
5. Inform trades of scaffold load limitations;
6. Monitor loading of decks;
7. Verify that any ties that are temporarily removed are properly restored in the same shift;
8. Verify that outriggers and planks that are moved are properly set up and secured;
9. Verify that all scaffold decks in use have proper access/egress;
10. Verify that all open sides of decks in excess of 14 inches have proper guardrails and toe-boards;

11. Notify appropriate parties, including but not limited to the Resident Engineer, Site Safety Coordinator / Monitor, Site Safety consultant, scaffold users, Contractor and the Scaffold Engineer, of misuses, non-conformances, hazards and accidents; and,
12. Keep a log of significant actions and events connected with the scaffolding.

B. The Contractor will be responsible for erecting, maintaining, and dismantling the scaffolding and/or sidewalk shed in conformance with requirements of the NYC Building Code, OSHA and the Contract Documents, including the Specifications. The Contractor must also be guided by generally accepted standards of scaffold industry practice as promulgated by the Scaffold Industry Association.

C. The Contractor must require the Subcontractor responsible for erecting the scaffolding to engage a Scaffold Engineer, licensed as a professional engineer by the State of New York. The Scaffold Engineer will be responsible to ensure the following: (1) that the installation design is in compliance with requirements of the NYC Building Code and OSHA, (2) that the design comports with the capabilities of the components and the characteristics of the site, (3) that scaffold loads on the host building, including netting, have been properly considered, and (4) that the design documents provide accurate information for erectors and users.

D. Scaffold users are trade contractors assigned to work on the scaffold. Training certificates from a DOB-approved training provider are mandatory. These users have a duty to become familiar with the NYC Building Code and OSHA requirements germane to users, to obey the instructions of the Jobsite Safety Coordinator, and to inform the Jobsite Safety Coordinator of known hazards, non-conformances, or violations.

1.5 JOBSITE DOCUMENTATION AND SUBMITTALS:

A. The Contractor must prepare, obtain, and submit the following to the Commissioner:

1. NYC DOB permit(s) for scaffold and sidewalk sheds (as applicable) including filing applications signed and sealed by a Professional Engineer licensed in the State of New York;
2. Site logistics plan / site safety plan;
3. Installation drawing(s), design, and product data to be provided for **all** scaffold(s) and shed(s) must include, at a minimum:
    a. Plan(s);
    b. Elevation(s);
    c. Duty load designation: “standard” (150 psf live load) or “heavy duty” (300 psf live load);
    d. Details including base support, anchors and ties;
    e. Notes and specifications including load limits, number of planked levels, tie spacing, netting, and sequence of installation and removal;
    f. Anchorage into sound material;
    g. Load limits based on pull tests;
    h. Specifications for pull test(s), method, proof load and the number of trials;
    i. Elevations, levels or heights, where anchorage is made into masonry;
    j. Specifications for frames, planks, screw jacks, anchors, and any other ancillary hardware;
    k. Samples for anchors, ties and netting;
    l. Sequence of operations for erection and demolition;
    m. Location plan, heights, widths, “jumps” over doorways and driveways;
    n. Specify size, maximum span and maximum spacing of headers and stringers;
    o. Specify legs, girts, braces, nailing and connections; and,
    p. All sidewalk sheds must be designed, engineered, signed, and sealed by a Professional Engineer licensed in the State of New York.
        i. Generic (not job-specific) engineering drawings are satisfactory for standard sheds and arrangements.

ii. Special engineering is required for custom sheds, site-specific problems or non-standard arrangements.

1.6 INSPECTIONS:

A. Signed inspection reports must be issued for each inspection and pull-test below, and must be logged and maintained on site by the Jobsite Safety Coordinator for the duration of the Project.

B. Pull testing will be required during design, and during or post erection, where anchorage is made into masonry. The Scaffold Engineer must specify the test method, proof load, and the number of trials.

C. Sidewalk sheds must be inspected after initial installation, major modification, or damage and thence every three months. Inspections must be by a Scaffold Engineer for custom sheds and by a Competent Person employed by the Contractor for standard sheds.

D. Scaffolds must be inspected by the Scaffold Engineer during erection, post-erection, and prior to use and thence every three (3) months. The Scaffold Engineer must repeat inspections after major alteration/ modification, and/or damage.

E. A Qualified Person assigned by the Contractor must inspect: the progress of erection and dismantling; and, the condition and integrity of the sidewalk sheds after high winds, major storms, and at least once per month during usage.

F. A Qualified Person assigned by the Contractor must inspect: the progress of erection and dismantling at least weekly; and, the condition and integrity of the scaffold after high winds, major storms, and at least once per month during usage.

G. Scaffolds and Sidewalk Sheds must be inspected daily by the Jobsite Safety Coordinator or alternate, prior to use by scaffold users. The inspection results must be recorded in the maintenance log and must always be available on-site.

H. At the completion of the Project, submit all inspection documents as Miscellaneous Record Documents in accordance with SECTION 01 78 39 CONTRACT RECORD DOCUMENTS.

1.7 LADDERS AND STAIRS:

A. The Contractor must provide and maintain ladders or temporary stairs extending from the street to the first story, and to and from every floor and roof level of the Project.

1.8 ACCESS AND EXITS:

A. The ladders or temporary stairs must be of acceptable size, number and location, so that proper and convenient access may be had by those required to proceed to and from all parts of the Project.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.9

1.9 PAYMENT FOR SIDEWALK SHEDS:

A. Payment for sidewalk sheds will be made on a unit price basis.

B. The quantity to be measured for payment under this item will be the number of months (to the nearest 1/4 month increment) that the Contractor satisfactorily provides for sidewalk sheds in accordance with these specifications.

C. The unit price bid per month for sidewalk sheds must include the cost of furnishing all labor, materials, plant, equipment, insurance and incidentals required to provide sidewalk sheds, all in accordance with the Contract Drawings, these specifications, and the directions of the Commissioner.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 54 23

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 RELATED SECTIONS:

A. Section 01 42 00 REFERENCES for applicable industry standards for products specified.

1.4 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved by Commissioner through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics are listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure.

1.5 ACTION SUBMITTALS

A. Product Specification Submittals: Comply with requirements in Section 01 33 00 SUBMITTAL PROCEDURES. Show compliance with requirements.

B. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Review Action: If necessary, Commissioner will request additional information or documentation for evaluation and will notify Contractor of approval or rejection of proposed comparable product request.

    a. Format of Approval of Submittal: Per Article 1.6 of Section 01 33 00 SUBMITTAL PROCEDURES.
    b. Use product specified, or products by Manufacturers specified if Commissioner does not issue a decision on use of a comparable product request.

1.6 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:

    a. Name of product and manufacturer.
    b. Model and serial number.
    c. Capacity.
    d. Speed.
    e. Ratings.

3. See individual identification sections in Divisions 21, 22, 23, and 26 for additional identification requirements.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
5. Protect stored products from damage and liquids from freezing.

1.8 PRODUCT WARRANTIES

A. Warranties specified in other Sections will be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of Guaranty obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to the City of New York.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for the City of New York.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 77 00 CLOSEOUT PROCEDURES.

PART II – PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Descriptive, performance, and reference standard requirements in the Specifications establish required characteristics of products.
2. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
3. Commissioner will review and approve products with warranties meeting the requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Commissioner will make selection.

B. Or Approved Equal:

1. Comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product, or for use of a product by an unnamed Manufacturer, as designated by the term "Or approved equal".

2. Submit additional documentation required by Commissioner, in order to establish equivalency of proposed products. Evaluation of "Or approved equal" product status is by the Commissioner, whose determination is final.

C. Product Selection Procedures:

1. Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products will be considered. Comply with requirements in "Comparable Products" Article for consideration of a product by an unnamed manufacturer. Products' listing is indicated by the following:

    a. Products: Subject to compliance with requirements, provide one of the following:

        1) Manufacturer; Product designation
        2) Manufacturer; Product designation
        3) Manufacturer; Product designation
        4) Or approved equal

2. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed. Comparable products from unnamed Manufacturers will be considered. Comply with requirements in "Comparable Products" Article for consideration of a product by an unnamed manufacturer. Manufacturer's listing is indicated by the following:

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) Manufacturer
        2) Manufacturer
        3) Manufacturer
        4) Or approved equal

3. Basis-of-Design Product: Where Specifications name a basis-of-design product, provide the specified product, or a comparable product by one of the other named manufacturers. Drawings may indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Specifications indicate performance requirements and physical properties, durability and other special and required features that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers. Basis-of-Design Product listing is indicated by the following:

    a. Subject to compliance with requirements, provide [product indicated on Drawings] [manufacturer's name; product name or designation] or comparable product by one of the following:

        1) Manufacturer
        2) Manufacturer
        3) Or approved equal

4. Sole Source Product (Single Proprietary): Where Specifications name a single manufacturer and product, provide the named product. A Sole Source Product selection requires prior request by the Design Consultant and approval by the Commissioner for its inclusion in specifications. Sole Source Product is indicated by the following phrase listing:

    a. Sole Source Product: Manufacturer's name and Product designation.

        1) No substitutions Permitted.

D. Visual Matching Specification: Where Specifications require "match Commissioner's sample," provide a product that complies with requirements and matches Commissioner's sample. Commissioner's decision will be final on whether a proposed product matches.

E. Visual Selection Specification: Where Specifications include the phrase "as selected by Commissioner from manufacturer's full range" or similar phrase, select a product that complies with requirements. Commissioner will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products (Or Approved Equal): Commissioner will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Commissioner may return requests without action, except to record noncompliance with these requirements:

B. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.

C. Evidence that proposed product provides specified warranty.

D. List of similar installations for completed projects with project names and addresses and names and addresses of architects and Owners, if requested.

E. Samples, if requested.

F. Submittal Requirements: Approval by the Commissioner of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements.

G. Comply with all other specified product and submittal requirements.

PART III – EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00
EXECUTION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes general procedural requirements governing execution of the Work including without limitation the following:

1. Delivery of Materials
2. Contractor's Superintendent
3. Surveys
4. Borings
5. Examination
6. Environmental Assessment
7. Preparation
8. Deferred Construction
9. Installation
10. Permits
11. Transportation
12. Sleeves and Hangers
13. Sleeve and Hanger Drawings
14. Cutting and Patching
15. Location of Partitions
16. Furniture and Equipment
17. Removal of Rubbish and Surplus Material
18. Cleaning
19. Security and Protection of Work Site
20. Maintenance of Site and Adjoining Property
21. Maintenance of Project Site
22. Safety Precautions for Control Circuits
23. Obstructions in Drainage Lines
24. Correction of the Work

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 33 00 SUBMITTAL PROCEDURES
D. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT & DISPOSAL
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	Definition
Design Consultant	The entity responsible for providing design services for the Project, including, without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 QUALITY ASSURANCE:

A. Land Surveyor Qualifications: A professional land surveyor who is licensed in the State of New York and who is experienced in providing land-surveying services of the kind indicated.

PART II - PRODUCTS (Not Used)

PART III - EXECUTION

3.1 DELIVERY OF MATERIALS:

A. Material Orders: The Contractor must furnish to the Commissioner a copy of each material order, indicating date of order and quantity of material, and must also notify the Commissioner when materials have been delivered to the Site and in what quantities.

B. Ample Quantities: The Contractor must deliver materials in ample quantities to ensure the most prompt and uninterrupted progress of the Work so as to complete the Work within the Contract time.

C. Containers: The manufacturer's containers must be delivered with unbroken seals and must bear proper labels.

D. Deliveries: The Contractor must coordinate deliveries in order to avoid delaying or impeding the progress of the Work.

E. Handling: The Contractor must provide equipment and personnel to handle products by methods to prevent soiling or damage.

1. Promptly inspect shipments to assure products comply with requirements, quantities are correct, and products are undamaged.

2. Promptly return damaged shipments or incorrect orders to manufacturer.

3. For materials or equipment to be reused or salvaged, use special care in removal, storage and reinstallation to insure proper function in completed Work.

F. Storage: Store products in accordance with provisions of Article 3.1 of the Standard Construction Contract, and periodically inspect to assure that stored products are undamaged and are maintained under required conditions.

G. Stacking: All materials must be properly stacked in convenient places adjacent to the Site, or where directed, and protected in a satisfactory manner. Stacked materials must be arranged so as to not interfere with visibility of traffic control devices.

H. Overloading: If the Commissioner permits the storage of materials in any part of the Project area, they must be so stored as to cause no overloading.

I. No Interference: If it becomes necessary to remove and restack materials to avoid impeding the progress of any part of the Work or interfering with the Work to be done by any trade Subcontractor, the Contractor must remove and restack such materials at no additional cost to the City.

3.2 CONTRACTOR'S CONSTRUCTION SUPERINTENDENT:

A. Contractor's Construction Superintendent: The Contractor must devote its time and personal attention to the Work and must employ and retain at the Project Site, from commencement until Final Acceptance, a Contractor's Construction Superintendent. The Contractor's Construction Superintendent must be registered with the New York City Department of Buildings (DOB) in compliance with the Construction Superintendent Rule of the City of New York, be competent and capable of maintaining proper supervision and care of the Work, and be acceptable to the Commissioner. The Construction Superintendent, in the absence of the Contractor, and irrespective of any superintendent or foreman employed by any Subcontractor, must see that the instructions of the Commissioner are carried out.

B. Replacement: The Contractor's Construction Superintendent on the job must not be changed or removed without the consent of the Commissioner.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 SURVEYS:

A. Line and Grade: The City will establish a baseline and bench mark near the Site of the Work for use by the Contractor in connection with the performance of the Work.

B. Responsibility: The Contractor must establish all other lines and elevations required for the Work and must be solely responsible for the accuracy thereof.

C. Safeguard All Points: The Contractor must safeguard all points, stakes, grade marks and bench marks made or established by the Contractor on the Work. The Contractor must re-establish same if disturbed, and bear the entire expense of rectifying the Work if improperly installed due to not maintaining, protecting or removing without authorization from the Commissioner such established points, stakes, or marks.

D. City Monuments and Markers: No Work must be performed near City monuments or markers so as to disturb them until the said monuments or markers have been referenced or reset or otherwise disposed of by the relevant Agency or party who installed them.

E. Foundations: The Contractor must furnish certification from a licensed Surveyor that all portions of the foundation Work are located in accordance with the Contract Drawings and at the elevations required thereby. This certification must show the actual locations and the actual elevations of all the Work in relation to the locations and elevations shown on the Contract Drawings, including, but not restricted to the following:

1. The locations and elevations of all piles, if any.
2. Elevations of tops of all spread footings, tops of pile caps, and tops of all foundation walls, elevator pit walls and ramp walls.
3. Location of all footing centers and pier centers including those for exterior wall columns.
4. Location of all foundation walls including wall columns, elevator pit walls and ramp walls.

F. Wall Lines: After the first courses of masonry or stone have been laid, the Contractor must establish the permanent lines of exterior walls. The Contractor must promptly furnish certification from a licensed Surveyor in the form of signed original drawings showing the exact location of such wall lines of all portions

of all structures. Except at its own risk, the Contractor must not proceed further with the erection of walls until the Surveyor's certification has been submitted and verified for correct location of wall lines.

G. Surveyor: The Surveyor selected for any of the purposes mentioned in Paragraph E and Paragraph F above, and Paragraph I below, must be a land Surveyor licensed in the State of New York and must be subject to the approval of the Commissioner. The Surveyor must not be a regular employee of the Contractor, nor must the Surveyor have any interest in the Contract. The Surveyor's certification must represent an independent and disinterested verification of all layout. The Surveyor must report to the Department of Design and Construction's (DDC) Resident Engineer each time upon arrival to and departure from the Site and review with the Resident Engineer the data required for the Project.

H. Final Certification: Final certification must be submitted upon completion of the Work or upon completion of any subdivision of the Work as directed by the Commissioner. Any exceptions or deviations from the Contract Drawings must be noted on the final certificate and must include any maps, plates, notes, pertinent documents and data necessary, in the opinion of the Commissioner, to constitute a full and complete report.

I. Final Survey: The Contractor must submit to DDC for submission to DOB a final Survey by the licensed Surveyor showing the location of the new Work, before completion of the Work. This Survey must show the location of the first tier of beams or of the first floor; the finish grades of the open spaces on the plot; the established curb level and the location of all other Work on the plan, together with the location and boundaries of the lot or plot upon which the Work is constructed, curb cuts, all yard dimensions, etc.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4

3.4 BORINGS:

A. The work of this article must be the responsibility of the Contractor unless otherwise indicated.

B. Reference Drawings: The boring drawings as listed on the title sheet are for information to the bidder and are to be used under the conditions as follows:

1. Boring logs: shown on the boring drawings, record information obtained under engineering supervision in the course of exploration carried out by or under the direction of DDC at the Site.

2. Soils and Rock Samples: All inferences are drawn from the indications observed as made by engineering and scientific personnel. All such inferences and all records of the Work, including soil samples and rock cores, if any, are available to bidders for inspection.

3. Certification of Samples: The City certifies that the Work was carried out as stated, and that the soil samples and rock cores were actually taken from the site at the times, places, and in the manner indicated on the boring drawings. The samples are available for inspection in DDC’s Subsurface Exploration Unit.

4. Bidder’s Responsibility: The bidder, however, is responsible for any conclusions to be drawn from the Work. If the bidder accepts those of the City, it must do so at its own risk. If the bidder prefers not to assume such risk, the bidder is under the obligation of employing its own experts to analyze the available information and must be responsible for any consequences of acting on their conclusions.

5. Continuity Not Guarantee: The City does not guarantee continuity of conditions shown at actual boring locations over the entire Site. Where possible, borings are located to avoid all obstructions and previous construction which can be found by inspection of the surface. The bidder is required to estimate the influence of such features from its own inspection of the Site.

3.5 EXAMINATION:

A. Existing Conditions: The existence and location of Site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning the Work, the Contractor must investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, the Contractor must verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground utilities and other construction indicated as existing are not guaranteed. Before beginning Site Work, the Contractor must investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, the Contractor must verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, water-service piping, and underground electrical services.
2. The Contractor must furnish location data for Work related to the Project that must be performed by public utilities serving the Project Site.

C. Acceptance of Conditions: Examine all existing substrates, areas, equipment, and conditions, with the Subcontractor responsible for purchase of equipment, installation or application, for compliance with requirements for installation tolerances, equipment compatibility, and other conditions affecting performance. The Contractor must record observations of these examinations:

1. Verify compatibility with and suitability of substrates and equipment, including compatibility with existing finishes, primers, electrical services, and mechanical equipment.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces, equipment, and conditions.

3.6 ENVIRONMENTAL ASSESSMENTS:

A. City Responsibilities: An Environmental Assessment and survey is performed by DDC and its findings are included in the Contract Documents. In accordance with the NYC Administrative Code Title 15 Chapter 1, an asbestos survey is required to be performed by an Asbestos Investigator certified by the NYC Department of Environmental Protection (DEP) to identify the presence of asbestos containing material (ACM) prior to any alteration, renovation, or demolition activity. The findings of such survey are required for the submission of approvals and permits issued by DOB. When the findings indicate that asbestos containing material is present and will be disturbed during the alteration, renovation, or demolition activity, then abatement design specifications will be incorporated into the Contract Documents. The Contractor must comply with all federal, state and local asbestos regulations affecting the work for this Contract.

B. Contractor Responsibility: The Contractor must comply with all federal, state and local environmental regulations, including without limitation, United States Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) regulations, which require the Contractor to assess if lead-based paint will be disturbed during the Work in order to protect the Contractor's workers and the building occupants from migration of lead dust into the air. The Contractor must comply with all federal, state and local environmental waste disposal regulations which may be required during the Work. The Contractor is required to hire licensed abatement and disposal companies for the requisite Work.

3.7 PREPARATION:

A. Field Measurements: The Contractor must verify all dimensions and conditions on the Site so that all Work will properly join the existing conditions.

B. Before commencing the Work, the Contractor must examine all adjoining materials on which its Work is in any way dependent on good workmanship in accordance to the intent of the Specifications and the Contract Drawings. The Contractor must report to the Commissioner any condition that will prevent it from performing Work that conforms to the required Specifications.

C. Existing Utility Information: The Contractor must furnish information to the Commissioner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Additionally, the Contractor must coordinate with authorities having jurisdiction.

D. Space Requirements: The Contractor must verify space requirements and dimensions of items shown diagrammatically on the Contract Drawings.

3.8 DEFERRED CONSTRUCTION:

A. In order to permit the installation of any item or items of equipment required to be furnished and installed within the time allowed for completing the Work of the Contract, the Contractor must defer construction Work limited to adequate areas as approved and certified by the Commissioner.

B. The Contractor must confer with the affected trade Subcontractors and ascertain arrangements, time, and facilities necessary to be made by the Contractor in order to execute the provisions specified herein.

3.9 INSTALLATION:

A. General: The Contractor must locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical Work plumb and make horizontal Work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated on the Contract Drawings.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory-prepared and field-installed. Check shop drawings of other work and work of trade Subcontractors to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the Design Consultant.

2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral

anchors that are to be embedded in concrete or masonry. Deliver such items to Project Site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.10 PERMITS:

A. The Contractor must comply with all local, state and federal laws, rules, and regulations affecting the Work of this Project, including, without limitation, (1) obtaining all necessary permits for the performance of the Work prior to commencement thereof, and (2) complying with all requirements for the disposal of demolition and/or construction debris, waste, etc., including disposal in City landfills. The Contractor must be responsible for all costs in connection with such regulatory compliance, unless otherwise specified in the Contract.

3.11 TRANSPORTATION:

A. Availability: The Contractor must determine the availability of transportation facilities and dockage for the use of its employees, equipment, and materials, and the conditions under which such use will be permitted.

B. Costs: If transportation facilities and dockage are available and are permitted to be used by the governmental agency having jurisdiction, the Contractor must pay all necessary costs and expenses, and abide by all rules and regulations promulgated in connection therewith.

C. Vehicles: With respect to the use of vehicles on highways and bridges, the Contractor's attention is directed to the limitations set forth in the Rules of the City of New York, Title 34, Chapter 4, Section 4-15.

D. Continued Use: It is understood that the Commissioner makes no warranty as to the continued use by the Contractor of such facilities.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.12

3.12 SLEEVES AND HANGERS:

A. Coordinate with Progress Schedule: The Contractor must promptly furnish and install conduits, outlets, piping sleeves, boxes, inserts and all other materials and equipment that is to be built into the Work in conformity with the requirements of the Project.

B. Cooperation of Subcontractors: All Subcontractors must fully cooperate with each other in connection with the performance of the above Work as "cutting in" new work is neither contemplated nor will it be tolerated.

C. Timeliness: To avoid delay, in the event that timely delivery of sleeves and other materials cannot be made, the Contractor may arrange to have boxes or other forms set at the locations where the piping or other material is to pass through or into the slabs, walls or other Work. Upon the subsequent installation of the sleeves or other material, the Contractor must fill around them with materials as required by the Contract. The necessary expenditures incurred for the boxing out and filling in must be borne by the Contractor.

D. Inserts: The Contractor is to install strip inserts four (4) foot on center and perpendicular to beams in ceiling slabs of boiler, machine, and mechanical equipment rooms. Inserts are to be installed for strippable concrete slabs only.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.13

3.13 SLEEVE AND PENETRATION DRAWINGS:

A. As soon as practicable after the commencement of Work, and when the order in which concrete for the first slabs, walls, etc. to be poured is determined, the Contractor must submit to DDC a sketch indicating the location and size of all penetrations for sleeves, ducts, etc. which will be required to accommodate the mechanical trades in order to determine if such penetrations will materially weaken the Project's structure.

The sketch must be stamped and returned if approved and/or comments will be transmitted. The Contractor must continue to submit sketches as the pouring schedule and the concrete Work progresses and until approvals for the penetration sketches have been given. The Contractor must not predicate its layout Work on unapproved sketches.

3.14 CUTTING AND PATCHING:

A. Responsibility: The Contractor must do all cutting, patching, and restoration required by its Work, unless otherwise particularly specified in the Specifications.

B. Restore Work: The Contractor must restore any Work damaged during the performance of the Work.

C. Competent Workers: All restoration Work must be done to the satisfaction of the Commissioner by competent workers skilled in the trade required by such restoration. If, in the judgment of the Commissioner, workers engaged in restoration Work are incompetent, they must be replaced immediately by competent workers.

D. Structural Elements: Do not cut and patch structural elements without the prior approval, in writing, of the Commissioner.

E. Operational Elements: Do not cut and patch operating elements and related components.

F. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Commissioner's opinion, reduce the building's aesthetic qualities. The Contractor must remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

G. Existing Warranties: The Contractor must remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

H. Removals: The Contractor must remove from the premises all demolished materials of every nature or description resulting from cutting, patching, and restoration work, in accordance with the requirements hereinafter stipulated under Sub-Section 3.17 herein and as further required in Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.15

3.15 LOCATION OF PARTITIONS:

A. Within three (3) weeks after the concrete slabs have been poured on each floor level, the Contractor must immediately locate accurately all of the partitions, including the door openings, on the floor slabs in a manner approved by the Commissioner.

3.16 FURNITURE AND EQUIPMENT:

A. Responsibility: The Contractor is responsible for moving all loose furniture and/or equipment in all areas where the location of such furniture and/or equipment interferes with the proper performance of its Work.

B. Protection: All such furniture and/or equipment must be adequately protected with dust cloths and returned to their original locations when directed to do so by the Commissioner.

3.17 REMOVAL OF RUBBISH AND SURPLUS MATERIALS:

A. Of the waste that is generated during demolition, as many of the waste materials as economically feasible must be reused, salvaged, or recycled. Waste disposal in landfills must be minimized. Comply with requirements of Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

B. Rubbish: Rubbish must not be thrown from the windows or other parts of the Project. Mason's rubbish, dirt and other dust-producing material must be wetted down periodically.

C. Location: The Contractor must clean the Project Site and Work area daily, sweep up, and deposit at a location designated on each floor, all of its rubbish, debris, and waste materials as it accumulates or more frequently when directed by the Commissioner. Wood crating must be broken up, neatly bundled, tied, and stacked ready for removal and be deposited at a location designated on each floor.

1. Comply with requirements in NYC Fire Department for removal of combustible waste materials and debris.

2. Do not hold materials more than seven (7) Days during normal weather or three (3) Days if the temperature is expected to rise above 80 degrees F (27 degrees C).

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

D. Laborers: Since the Contractor is responsible for the removal of all rubbish, etc., from the Site, the Contractor must employ and keep engaged for this purpose an adequate number of laborers.

E. Surplus Materials: The Contractor must remove from the Site all surplus materials when there is no further use for same.

F. Tools and Materials: At the conclusion of the Work, all erection plant, tools, temporary structures and materials belonging to the Contractor must be promptly removed.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

3.18 CLEANING:

A. The Contractor must thoroughly clean all equipment and materials furnished and installed, and must deliver such materials and equipment undamaged in a clean and new appearing condition up to date of Final Acceptance.

B. Site: Maintain Project Site free of waste materials and debris.

C. Installed Work: Keep installed Work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of the product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

D. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

E. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration up to date of Final Acceptance.

F. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration up to date of Final Acceptance.

3.19 SECURITY AND PROTECTION OF WORK SITE:

A. Provide protection of installed Work, including appropriate protective coverings, and maintain conditions that ensure installed Work is without damage or deterioration up to date of Final Acceptance.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

C. Secure and protect Work and Work Site against damage, loss, injury, theft and/or vandalism.

D. Maintain daily sign-in sheets of workers and visitors and make the sheets available to the Commissioner.

3.20 MAINTENANCE OF SITE AND ADJOINING PROPERTY:

A. The Contractor must take over and maintain the Project Site, after order to start Work.

B. The Contractor must be responsible for the safety of the adjoining property, including sidewalks, paving, fences, sewers, water, gas, electric and other mains, pipes and conduits etc. until the date of Final Acceptance. The Contractor must, at its own expense, except as otherwise specified, protect same and maintain them in at least as good a condition as that in which the Contractor finds them.

C. All pavements, sidewalks, roads and approaches to fire hydrants must be kept clear at all times, maintained and repaired to serviceable condition with materials to match existing.

D. Provide and keep in good repair all bridging and decking necessary to maintain vehicular and pedestrian traffic.

E. The Contractor must also remove all snow and ice as it accumulates on the sidewalks within the Contract Limits Lines.

3.21 MAINTENANCE OF PROJECT SITE:

A. The Contractor must take over and maintain all Project areas, after order to start Work.

B. Until the date of Final Acceptance, the Contractor must be responsible for the safety of all Project areas, including water, gas, electric and other mains and pipes and conduits and must, at the Contractor's own expense, except as otherwise specified, protect same and maintain them in at least as good condition as that in which the Contractor finds them.

C. All pavements, sidewalks, roads and approaches to fire hydrants must be kept clear at all times, maintained, and if damaged, repaired to serviceable conditions with materials to match existing.

D. The Contractor must keep the space for the Resident Engineer in a clean condition.

3.22 SAFETY PRECAUTIONS FOR CONTROL CIRCUITS:

A. Control circuits, the failure of which will cause a hazard to life and property, must comply with DOB Bureau of Electrical Control requirements.

3.23 OBSTRUCTIONS IN DRAINAGE LINES:

A. The Contractor must be responsible for all obstructions occurring in all drainage lines, fittings, and fixtures after the installations and cleaning of these drainage lines, fittings, and fixtures, as certified by the Resident Engineer. Roof drains must be kept clear of any and all debris. Any stoppage must be repaired immediately at the expense of the Contractor.

3.24 CORRECTION OF THE WORK

A. Subject to the terms of the Contract, the Contractor must complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Contractor must repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

    a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 73 00

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and procedural requirements for the management and disposal ofconstruction waste and includes the following requirements:
   1. Waste Management Goals
   2. Waste Management Plan
   3. Progress Reports
   4. Progress Meetings
   5. Management Plan Implementation

B. This section includes:
   1. Definitions
   2. Waste Management Performance Requirements
   3. Reference Resources
   4. Submittals
   5. Quality Assurance
   6. Waste Plan Implementation
   7. Additional Demolition and Salvage Requirements
   8. Disposal

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
D. Section 01 73 00 EXECUTION
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS
G. Refer to the Addendum to identify whether this Project is designed to comply with a Certification Level according to the U.S. Green Building Council's LEED Rating System, as specified in Section 01 81 13.03"SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS" or Section 01 81 13.04 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS".

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the GeneralConditions not otherwise defined herein.

Term	**Definition**
Alternative Daily Cover (ADC)	Material other than earthen material placed on the surface of the active face of a municipal solid Waste landfill at the end of each Work Day to control vectors, fires, odors, blowing litter and scavenging.
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the Design Consultant may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Clean	Untreated and unpainted; not contaminated with oils, solvents, caulk or the like.
Construction and Demolition (C&D) Waste	Solid Wastes typically including building materials, trash debris and rubble resulting from remodeling, repair and demolition operations. Hazardous materials and land clearing Waste are not included.
Diversion from Landfill	Material removal from the Site for Recycling, Reuse or Salvage that might otherwise be sent to a landfill.
Off-site Sorting	Material types that are combined on the project site and hauled away for sorting. Measured weights only. Approximations of weight or volume based on visual inspection are not acceptable. a. Off-site Sorting Method 1: Diversion Rate derived from the weight of the individual diverted material type divided by the weight of the commingled waste. Individual diverted material types handled through this sorting method are each counted as an individual diverted material type. b. Off-site Sorting Method 2: Diversion Rate derived from the waste sorting facility average diversion rate, multiplied by the weight of the commingled waste. All diverted materials handled through this sorting method are counted as a single diverted material type.
On-site Sorting	Material types that have been sorted in segregated containers or project areas for removal as segregated diverted material types. Measured weights only. Approximations of weight or volume based on visual inspection are not acceptable. a. On-site Sorting: Diversion Rate derived from the weight of the diverted material type. Material diverted through this sorting method are each counted as an individual diverted material type.
Recyclable	The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product.
Recycle (recycling)	To sort, separate, process, treat or reconstitute solid Waste and other discarded materials for the purpose of redirecting such materials into the manufacture of useful products. Recycling does not include burning, incinerating or thermally destroying Waste.
Return	To give back Reusable items or unused products to vendors.

Reuse	To reuse excess or discarded construction material in some manner on the Project Site.
Salvage	To remove a Waste material from the Project Site for resale or reuse.
Waste	Extra material or material that has reached the end of its useful life in its intended use. Waste includes Salvageable, Returnable, Recyclable and Reusable material.
Waste Management Plan	A Project-related plan for the collection, transportation and disposal of Waste generated at the construction Site. The purpose of the plan is to ultimately reduce the amount of material becoming landfill.
Waste-to-Energy	The conversion of non-Recyclable Waste materials into usable heat, electricity or fuel through a variety of processes, including combustion, gasification, pyrolization, anaerobic digestion and landfill gas recovery.

1.5 WASTE MANAGEMENT PERFORMANCE REQUIREMENTS:

A. The City of New York has established that this Project must generate the least amount of Waste possible and employ processes that ensure the generation of as little Waste as possible due to error, inaccurate planning, breakage, mishandling, contamination, or other factors.

B. Of the Waste that is generated during demolition, as many of the Waste materials as economically feasible, and as stated here, must be Reused, Salvaged, or Recycled. Waste disposal in landfills must be minimized.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.5 C

C. LEED CERTIFICATION: The City of New York will seek Leadership in Energy and Environmental Design (LEED) certification for this Project as indicated in the Addendum to the General Conditions from the U.S. Green Building Council. The documentation required here will be used for this purpose. LEED awards points for a variety of sustainable design measures on a project, one of which is the Reuse and Recycling of project Waste.

D. DIVERSION REQUIREMENTS. With the exception of LEED v4 projects with demolition ADC Waste, a minimum of seventy-five percent (75%) of total Project demolition and construction Waste (by weight) must be diverted from landfill through at least four (4) diverted material types. LEED v4 projects with demolition ADC Waste must divert a minimum of fifty percent (50%) of total Project demolition and construction Waste (by weight) from landfill through at least three (3) diverted material types. The following Waste categories are likely candidates to be included in the diversion plan as applicable for this Project:

1. Concrete;
2. Bricks;
3. Concrete masonry units (CMU);
4. Asphalt;
5. Metals (e.g. banding, stud trim, ceiling grid, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, brass, bronze);
6. Clean dimensional wood;

7. Carpet and pad;
8. Drywall;
9. Ceiling tiles;
10. Cardboard, paper and packaging; and
11. Reuse items indicated on the Contract Drawings and/or elsewhere in the Specification.

E. All fluorescent lamps, High Intensity Discharge lamps and mercury-containing thermostats removed from the Site must be Recycled. Do not use bulb crusher on Site.

F. Recycling on the job, subject to the Commissioner's approval, is encouraged on the Site itself, such as the crushing and reuse of removed sound concrete and stone. Include these categories in the Waste Management Plan.

G. Land-clearing debris is not considered construction, demolition or renovation Waste and is not to be included as contribution to Waste diversion.

H. A minimum of five (5) material types, both structural and nonstructural, are to be identified in the Construction Waste Management Plan for diversion.

I. For LEED v4 projects, material to be used as ADC does not qualify as material diverted from disposal.

1.6 REFERENCES, RESOURCES:

A. DDC encourages its Contractors to seek information from websites and experts in Salvage or Recycling inorder to minimize disposal costs. There are numerous opportunities to sell, Salvage, or to donate materials and accrue tax benefits (which would accrue to the Contractor responsible for removal); there are also outlets that will pick up, and in some cases, buy Recyclable materials. Examples of information resources are as follows:

1. A standard Construction and Demolition (C&D) Waste Management Log form is available through DDC's Sustainable Design website: https://www1.nyc.gov/assets/ddc/downloads/Sustainable/forms-local-law-86/waste-tracking-form.pdf.
2. Web Resources (information only; no warranty or endorsement is implied):
    a. www1.nyc.gov/assets/donate/site/ – Website of donateNYC, a network of nonprofit organizations in New York City that accept and distribute second-hand and surplus goods.
    b. www.bignyc.org – Website of Build It Green NYC, a non-profit outlet for Salvaged and surplus building materials.
    c. www.usgbc.org – Website of the United States Green Building Council, with a description of the LEED certification process and requirements for C&D Waste Recycling.
    d. www.epa.gov/smm/sustainable-management-construction-and-demolition-materials– Website of the U.S. Environmental ProtectionAgency (EPA) that discusses C&D Waste issues, and links to other resources.
3. Waste-to-Energy Facilities that need to comply with European Standard (EN) for Waste management and emissions into air, soil, surface water and groundwater:
    a. www.ec.europa.eu/environment/waste/framework/index.htm – European Commission Waste Framework Directive 2008/98/EC.
    b. https://eur-lex.europa.eu/homepage.html - European Commission Waste

Incineration Directive 2000/76/EC.

c. www.cen.eu/cen/Products – EN Standards 303-1, 303-2, 303-3, 303-4, 303-5, 303-6, 303-7.

1.7 SUBMITTALS:

A. The Contractor must refer to Section 01 33 00 SUBMITTAL PROCEDURES for submittal requirements.

B. The Contractor must be responsible for the development and implementation of a Waste Management Plan for the Project. The Contractor's Subcontractors must assist in the development of that Plan, and collect and deposit their Waste and Recyclable materials in accordance with the approved Plan.

C. Draft Waste Management Plan: Within fifteen (15) Days after receipt of the Notice to Proceed (NTP), or prior to any Waste removal, whichever occurs sooner, the Contractor must submit to the Commissioner a Draft Waste Management Plan. Include separate sections for C&D Waste. The Plan must demonstrate how the performance goals will be met, and contain the following:

1. List of material types targeted for Reuse, Salvage, or Recycling, and names, addresses, and phone numbers of receiving facilities/companies that will be purchasing or accepting each material. Each material listed is to include estimated amount in tons and percentage of overall construction waste of each of the material steams.
2. Estimation of the percentage of overall construction waste that will be sent to landfill.
3. Description of on-Site and/or off-Site sorting methods for all materials to be removed from Site. Off-site sorting methods must be categorized as Off-site Sorting Method 1 or Off-site Sorting Method 2.
4. If mixed C&D Waste is to be sorted off-Site, provide a letter from the processor stating the average percentage of mixed C&D Waste they Recycle. Waste processor's average percentage of mixed C&D waste must not include Alternative Daily Cover as a recycled material for LEED v4 projects.
5. Landfill information: Names of landfills where non-Recyclable/reusable/salvageable Waste will be disposed, and list of applicable tipping fees.
6. Material handling procedures: Specify whether materials must be separated or commingled and describe the planned diversion strategies. Describe expected amount of each material type, where materials must be taken and how the Recycling facility must process the material. Provide a description of the means by which any Recyclable, Salvaged, or Reused materials will be protected from contamination and collected in a manner that will meet the requirements for acceptance by the designated Recycling processors.
7. Transportation: A description of the means of transportation and destination for Recycled materials.
8. Meetings: Regular meetings must be held monthly, or as directed by the Commissioner, and the Contractor must provide a description of these meetings to address Waste management.
9. Sample spreadsheet and description of how the implementation of the Plan will be documented and submitted on a monthly basis.

D. Final Waste Management Plan: Within fifteen (15) Days of Commissioner's approval of the Draft Waste Management Plan, the Contractor must submit a Final Waste Management Plan.

E. Progress Reports: The Contractor must submit a monthly Waste Management Progress Report, containing the following information:

1. Project title, name of company completing report, and dates of period covered by the report.
2. Report on the disposal of all Project Site Waste. A DDC C&D Waste Management Log form is included at the end of this section. For each shipment of material removed from the Site, provide the following:
    a. Date and ticket number of removal;
    b. Identity of material hauler;
    c. Material type;
    d. Waste sorting method;
    e. Total quantity of Waste, in tons/cubic yards, by type;
    f. Quantity of Waste Salvaged, Recycled and/or Reused, by type;
    g. Total quantity of Waste diverted from landfill (Recycled, Salvaged, Reused) as a percentage of total Waste; and
    h. Recipient of each material type.
3. Provide monthly and cumulative Project totals of Waste, quantity diverted, and percentage diverted.
4. Note that the unit of measurement may be either tons or cubic yards but must be consistent for all shipments and all materials throughout the Project. Reports with inconsistent or mixed units will not be reviewed and will be Returned for re-submission.
5. Include legible copies of on-Site logs, weight tickets and receipts. Receipts must be from charitable organizations, Recycling and/or disposal site operators who can legally accept the materials for the purpose of reuse, Recycling or disposal. Contractor must save such original documents for the life of the Project plus seven (7) years.

F. LEED Submittal: For LEED-designated projects, submit final LEED construction Waste report signed by the Contractor, tabulating total Waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met. Waste report must include:
    1. At least four (4) material streams for diverted materials;
    2. Documentation of Recycling rates for commingled facilities; and
    3. For Waste-to-Energy strategy, submit documentation of facility adherence to relevant EN standards, and justification for the strategy.

G. Refrigerant Recovery: Where refrigerant is recovered, submit statement of refrigerant recovery, which must include:
    1. Name, address, qualification data and signature of the refrigerant recovery technician responsible for recovering refrigerant;
    2. Statement that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations; and
    3. Date refrigerant was recovered.

1.8 QUALITY ASSURANCE:

A. The Contractor must designate a Construction Waste Management Representative to ensure compliance

with this section. The Representative must be present at the Project Site full-time and for the duration of the Project.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Waste Management Plans, documentation, and implementation must be discussed at the following meetings:

1. Pre-demolition kick-off meeting;
2. Pre-construction kick-off meeting;
3. Regular job-site meetings; and
4. Contractor toolbox meetings.

E. For LEED v4 projects, Waste-to-Energy Facilities: Comply with EN standards for Waste management and emissions into air, soil, surface water, and groundwater.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 WASTE PLAN IMPLEMENTATION:

A. Prior to the demolition and construction start, the Contractor must implement the Waste Management Plan, coordinate the Plan with all affected trades, and designate one individual as the Construction Waste Management Representative. The Representative will be responsible for communicating the progress of the Plan with the Commissioner on a regular basis and for assembling the required LEED documentation.

B. The Contractor must be responsible for the provision of containers and the removal of all Waste, non-Returned surplus materials and rubbish from the Site in accordance with the approved Waste Management Plan. The Contractor must oversee and document the results of the Plan. Monies received for Salvaged materials must remain with the Contractor, except the monies for those items specifically identified elsewhere in the specifications or indicated on the Contract Drawings as belonging to others.

C. Responsibilities of Subcontractors: Each Subcontractor must be responsible for collecting its Waste, non-Returned surplus materials and rubbish, in accordance with the Waste Management Plan.

D. Distribution: The Contractor must distribute copies of the Waste Management Plan to each Subcontractor,Resident Engineer, Construction Manager, and the Commissioner.

E. Instruction: The Contractor must provide on-Site instruction of proper Waste management procedures to be used by all parties at appropriate stages of the Project.

F. Procedures: Conduct Waste management operations to ensure minimum interference with Site vegetation, roads, streets, walkways and other adjacent, occupied, and used facilities. The waste management operations include, but are not limited to:

1. Collect commingled Waste and/or separate all Recyclable Waste in accordance with the Plan. Specific areas on the Project Site are to be designated, and appropriate containers and bins clearly marked with acceptable and unacceptable materials.
2. Inspect containers and bins for contamination and remove contaminated materials if found. Comply with requirements in the following General Conditions sections for controlling dust and dirt, environmental protection, and noise control: Section 01 81 19 - INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS, Section 01 81 13.03 - SUSTAINABLE

DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 - SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS, Section 01 10 00 – SUMMARY, Section 01 35 26 - SAFETY REQUIREMENTS PROCEDURES, Section 01 50 00 - TEMPORARY FACILITIES, SERVICES AND CONTROLS, and Section 01 73 00 – EXECUTION..

3.2 ADDITIONAL DEMOLITION AND SALVAGE REQUIREMENTS:

A. Demolition and Salvage of additional items indicated in other sections of the Project Specifications require special attention as part of the overall seventy-five percent (75%) Diversion from Landfill. Specific requirements for special attention are designated in other sections of the Project Specifications.

3.3 DISPOSAL:

A. General: Except for items or material to be Salvaged, Recycled, or otherwise Reused, remove Waste material from the Project Site and legally dispose of them in a manner acceptable to authorities having jurisdiction.
   1. Except as otherwise specified, do not allow Waste materials that are to be disposed of to accumulate on Site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn Waste materials.

C. Disposal: Transport Waste materials off Project Site and legally dispose of them.

END OF SECTION 01 74 19

Department of Design and Construction

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT LOG

Project Name: _____
Project I.D.: _____

Contractor: _____
Prepared by: _____
For Month: _____

Haul Date	Ticket #	Hauling Company	*Material Type[2]	Sorting Method[5]	Material Quantity (tons or cubic yards)[1] *Total Weight	Excluded Material[3]	*Diverted Material[4]	*Landfilled Material	*Material Recipient
					*Total		*Diverted	*Landfilled	
			Monthly Totals						
			% Diverted this Month*						
			Cumulative Totals						
			% Diverted to Date						

Notes:

1. Volume (cubic yards) may be used instead of weight if used for ALL amounts and ALL materials.
2. Includes concrete; bricks; concrete masonry units (CMU); asphalt; metals; clean dimensional wood; carpet and pad; drywall; ceiling tiles; cardboard, paper, and packaging; and any other Reuse items indicated on the Contract Drawings and/or elsewhere in the Specifications.
3. Excluded material includes soil or land clearing debris and for LEED v4 projects, Alternative Daily Cover (ADC) such as screen fines and 6” minus.
4. Diverted material includes Recycled and Reused material diverted from landfill. Recycled material is reprocessed into new products. Reused material is reclaimed, Salvaged or otherwise used in its original form, either on-site or off-site.
5. Sorting Method must be classified as On-Site Sorted, Off-Site Sorted Method 1, or Off-Site Sorted Method 2.

* These items must be listed in order to receive LEED credit.

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and general procedural requirements for Closeout Procedures, including, without limitation, the following:

1. Definitions
2. Substantial Completion
3. Final Acceptance
4. Warranties
5. Final Cleaning

B. LEED: Refer to the Addendum to identify whether this Project is designed to comply with a Certification Level according to the U.S. Green Building Council's (USGBC) Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13.03 “SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS” or Section 01 81 13.04 “SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS”.

C. COMMISSIONING: Refer to the Addendum to identify whether this Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED- NC procedures, as described in Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS and Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE. The Contractor must cooperate with the Commissioning Agent and provide whatever assistance is required.

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
D. Section 01 78 39 CONTRACT RECORD DOCUMENTS
E. Section 01 79 00 DEMONSTRATION AND OWNER’S PRE-ACCEPTANCE ORIENTATION

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	Definition
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the Design Consultant may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBSTANTIAL COMPLETION:

A. Preliminary Procedures: Before requesting inspection to determine the date of Substantial Completion, the Contractor must complete and supply all items required by the Contract Specifications, General Conditions, Addendum to the General Conditions, change orders or other directives from the Commissioner's representatives. The required items will include all Contract requirements for Substantial Completion, including, but not limited to, items related to releases, regulatory approvals, warranties and guarantees, record documents, testing, demonstration and orientation, final clean up and repairs, and all specific checklist of items by the Resident Engineer. (See Attachment "A" at the end of this section for sample requirements for Substantial Completion).

B. The Contractor must prepare and submit a list to the Resident Engineer of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

C. Inspection: The Contractor must submit to the Resident Engineer a written request for inspection for Substantial Completion. Within ten (10) Days of receipt of the request, the Resident Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. The Resident Engineer may request the services, as required, of the Design Consultant, client agency representative and/or other entities having involvement with the Work to assist in the inspection of the Work. If the Resident Engineer makes a determination that the Work is Substantially Complete and approves the Final Approved Punch List and the date for Final Acceptance, he/she will so advise the Commissioner and recommend issuance of the Certificate of Substantial Completion. If the Resident Engineer determines that the Work is not substantially complete, he/she will notify the Contractor of those items that must be completed or corrected before the Certificate of Substantial Completion will be issued.

1 Re-inspection: Contractor must request re-inspection when the Work identified in previous inspections as incomplete are completed or corrected.
2 Results of completed inspection will form the basis of the requirements for Final Acceptance.

1.6 FINAL ACCEPTANCE:

A. Preliminary Procedures: Before requesting final inspection for Final Acceptance of the Work, the Contractor must complete the following. (Note that the following are to be completed, submitted as appropriate, and approved by the Commissioner, as applicable, prior to the final inspection and are not to be submitted for approval or otherwise at the final inspection unless specifically indicated). List exceptions in the request.

1. Verify that all required submittals have been provided to the Commissioner including, but not limited to, the following:

   a. Manufacturer's cleaning instructions;

   b. Posted instructions;

   c. As-built Contract Documents (Drawings, Specifications, and product data) as described in Section 01 78 39 CONTRACT RECORD DOCUMENTS, incorporating any changes required

by the Commissioner as a result of the review of the submission prior to the pre-final inspection;

d. Operation and maintenance manuals, including preventive maintenance, special tools, repair requirements, parts list, spare parts list, and operating instructions;

e. Completion of required demonstration and orientation, as applicable, of designated personnel in operation and maintenance of systems, sub-systems and equipment;

f. Applicable LEED Building submittals as described in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS; and

g. Construction progress photographs as described in Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION.

2. Submit a certified copy of the Final Approved Punch List of items to be completed or corrected. The certified copy of the Punch List must state that each item has been completed or otherwise resolved for acceptance, and must be endorsed and dated by the Contractor.

3. Submit pest-control final inspection report and survey as required in Section 01 50 00 TEMPORARY FACILITIES AND CONTROLS.

4. Submit record documents and similar final record information.

5. Deliver tools and similar items.

6. Complete final clean-up requirements including touch-up painting of marred surfaces.

7. Submit final meter readings for utilities, as applicable, a measured record of stored fuel, and similar data as of the date when the City took possession of and assumed responsibility for corresponding elements of the Work.

B. Final Inspection: The Contractor must submit to the Resident Engineer a written request for inspection for Final Acceptance of the Work. Within ten (10) Days of receipt of the request, the Resident Engineer will either proceed with inspection or notify the Contractor of unfulfilled requirements. The Resident Engineer may request the services, as required, of the Design Consultant, client agency representative and/or other entities having involvement with the Work to assist in the inspection of the Work. If the Resident Engineer finds that all items on the Final Approved Punch List are complete and no further Work remains to be done, he/she will so advise the Commissioner and recommend the issuance of the determination of Final Acceptance. If the Resident Engineer determines that the Work is not complete, the Resident Engineer will notify the Contractor of those items that must be completed or corrected before the determination of Final Acceptance will be issued.

C. Final Acceptance: The Work will be accepted as final and complete as of the date of the Resident Engineer’s inspection if, upon such inspection, the Resident Engineer finds that all items on the Final Approved Punch List are complete and no further Work remains to be done. The Commissioner will then issue a written determination of Final Acceptance.

1.7 WARRANTIES:

A. Schedule B of the Addendum lists the items of materials and/or equipment for which manufacturer warranties are required. For each item of material and/or equipment listed in Schedule B, the Contractor must obtain a written warranty from the manufacturer. Such warranty must provide that the material or equipment is free from defects for the period set forth in Schedule B and will be replaced or repaired within such specified period. The Contractor must deliver all required warranties to the Commissioner.

B. Unless indicated otherwise, warranties are to take effect on the date of Substantial Completion.

C. Submittal Time: Submit written warranties on request of the Commissioner for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

D. Partial Occupancy: Submit properly executed warranties to the Commissioner within fifteen (15) Days of completion of designated portions of the Work that are completed and occupied or used by the City.

E. Organize the warranty documents into an orderly sequence based on the Project Specification Divisions and Section Numbers.

1. Bind warranties in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES"; name and location of Project; Capitol Budget Project Number (FMS ID); and Contractor's and applicable Subcontractor's name and address.
3. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation.
4. Provide a typed description of each product or installation being warranted, including the name of the product, and the name, address, and telephone number of the installer.

F. When warranted materials and/or equipment require operation and maintenance manuals, provide additional copies of each required warranty in each required manual. Refer to Section 01 78 39 CONTRACT RECORD DOCUMENTS, for requirements of operation and maintenance manuals.

PART II – PRODUCTS

2.1 MATERIALS:

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART III – EXECUTION

3.1 FINAL CLEANING:

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations, as applicable, before requesting inspection for Final Acceptance of the Work for the entire Project or for a portion of the Project:

a. Clean Project Site, yard, and grounds in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project Site.

e. Remove snow and ice to provide safe access to building.

f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

h. Sweep concrete floors broom clean in unoccupied spaces.

i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

k. Remove labels that are not permanent.

l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

n. Replace parts subject to unusual operating conditions.

o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

q. Clean ducts, blowers, and coils if units were operated without filters during construction.

r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

s. Leave Project clean and ready for occupancy.

t. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests, as required in Section 01 50 00 TEMPORARY FACILITIES, SERVICES AND CONTROLS. Prepare and submit a pest control report to the Commissioner.

D. Comply with all applicable safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on City's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project Site and dispose of lawfully.

END OF SECTION 01 77 00

SECTION 01 77 00

ATTACHMENT 'A'

The following list is a general sample of Substantial Completion requirements, including, but not limited to:

1. Prepare and submit a list to the Resident Engineer of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
2. Obtain and submit any necessary releases enabling the City unrestricted use of the Project and access to services and utilities.
3. Regulatory Approvals: Submit all required documentation from applicable governing authorities, including, but not limited to, the New York City Department of Buildings (DOB); Department of Transportation (DOT); Department of Environmental Protection (DEP); Fire Department (FDNY); etc. Documentation includes, but is not limited to, the following:
    a. Building permits, applications and sign-offs;
    b. Permits and sign-off for construction fences; sidewalk bridges; scaffolds, cranes and derricks; utilities; etc.;
    c. Certificates of inspections and sign-offs;
    d. Required certificates and use permits; and
    e. Certificate of Occupancy (C.O.), Temporary Certificate of Occupancy (T.C.O.) or Letter of Completion as applicable.
4. Submit specific warranties required by the Specifications, final certifications, and similar documents.
5. Prepare and submit Contract Documents as described in Section 01 78 39, CONTRACT RECORD DOCUMENTS, including but not limited to:
    a. Approved documentation from governing authorities;
    b. As-built record drawings and Specifications; product data; operation and maintenance manuals;
    c. Final Completion construction photographs;
    d. Damage or settlement surveys;
    e. Final property surveys; and
    f. Similar final record information.
    g. The Resident Engineer will review the submission and provide appropriate comments. If comments are significant, the initial submission will be returned to the Contractor for correction and re-submission incorporating the comments prior to the Final Inspection.
6. Record Waste Management Progress Report: Submit Construction & Demolition (C&D) Waste Management logs, with legible copies of weight tickets and receipts required in accordance with Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
7. If applicable submit LEED letter template in accordance with the requirements of Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

8. Schedule applicable demonstration and orientation required in other sections of the Project Specifications and as described in Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.
9. Deliver tools and similar items to location designated by Resident Engineer. Label with manufacturer's name and model number where applicable.
10. Make final changeover of permanent locks and deliver keys to the Resident Engineer. Advise Commissioner of changeover in security provisions.
11. Complete startup testing of systems as applicable.
12. Submit approved test/adjust/balance records.
13. Terminate and remove temporary facilities from Project Site, along with mockups, construction tools, and similar elements as directed by the Resident Engineer.
14. If applicable, complete Commissioning requirements as defined in Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS and/ or Section 01 91 15 BUILDING ENCLOSURE COMMISSIONNING REQUIREMENTS.
15. Complete final cleaning requirements, including touchup painting.
16. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

SECTION 01 78 39
CONTRACT RECORD DOCUMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and general procedural requirements for Contract Record Documents, including:
   1. Contract Record Drawings
   2. Record Specifications, Addenda and Change Orders
   3. Record Product Data
   4. Record Sample Submittal
   5. Construction Record Photographs
   6. Operating and Maintenance Manuals
   7. Final Site Survey
   8. Demonstration and Orientation DVD
   9. Guarantees and Warranties
   10. Waste Disposal Documentation
   11. LEED Materials and Matrix
   12. Miscellaneous Record Submittals

B. The Department of Design and Construction (DDC), at the start of construction (kick-off meeting), will furnish to the Contractor, at no cost, a complete set of Contract Record Drawings (PDF set) pertaining to the Work to be performed under the Contract. It is the responsibility of the Contractor to modify the Contract Drawings to indicate all changes and corrections, if any, occurring in the Work as actually installed. The Contractor is required to furnish all other drawings, if necessary, such as Addenda Drawings and Supplementary Drawings as may be necessary to indicate all Work in detail as actually completed. <u>All professional seals must be blocked out</u>. Title box complete with Project title and Design Consultants' names will remain.

C. Maintenance of Documents and Samples: The Contractor must maintain, during the progress of the Work, an accurate record of the Work as actually installed, on Contract Record Drawings (PDF set). Store Contract Record Documents and samples in the field office apart from the Contract Documents used for construction. Do not use Contract Record Documents for construction purposes. Maintain Contract Record Documents in good order and in a clean, dry, legible condition. Make documents and samples available at all times for the Resident Engineer's inspections.
   1. The Contractor's attention is particularly directed to the necessity of keeping accurate records of all subsurface and concealed Work, so that the Contract Record Drawings contain this information in exact detail and location. Contract Record Drawings must also show all connections, valves, gates, switches, cut-outs and similar operating equipment.

2. For projects designated to achieve a Leadership in Energy and Environmental Design (LEED) rating, the Contractor will receive a copy of the Project's LEED scorecard for the purpose of monitoring compliance with the target objectives and to facilitate coordination with the LEED Consultant. The Contractor will receive periodic updates of this scorecard and is required to submit the final version of the Scorecard at Substantial Completion with other Project Record Documents.

1.3 RELATED SECTIONS: include without limitation the following:

A.	Section 01 10 00	SUMMARY
B.	Section 01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
C.	Section 01 32 33	PHOTOGRAPHIC DOCUMENTATION
D.	Section 01 33 00	SUBMITTAL PROCEDURES
E.	Section 01 77 00	PROJECT CLOSEOUT PROCEDURES

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	**Definition**
Commissioning Authority / Commissioning Agent (CxA)	The entity responsible for providing commissioning services for the Project. The entity serving as the CxA may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the Design Consultant may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
LEED Consultant	The entity responsible for providing LEED sustainability services for the Project. The entity serving as the LEED Consultant may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBMITTALS:

A. As-Built Contract Record Drawings: The Contractor must comply with the following:

1. Progress Submission: As directed by the Resident Engineer, submit progress as-built Contract Record Drawings at the fifty percent (50%) construction completion stage.

2. Final Submission: Before Substantial Completion payment, the Contractor must furnish to the Commissioner one (1) complete set of marked-up as-built Contract Record Drawings, in PDF indicating all of the Work and locations as actually installed.

3. As-built Contract Record Drawings must be of the same size as that of the Contract Drawings, with a one (1) inch margin on three (3) sides and a two (2) inch margin on the left side for binding.

4. Each as-built Contract Record Drawing must bear the legend "AS-BUILT CONTRACT RECORD DRAWING" in heavy block lettering, one half (l/2) inch high, and contain the following data:

AS-BUILT CONTRACT RECORD DRAWING
Contractor's Name _____
Contractor's Address _____
Subcontractor's Name (where applicable) _____
Subcontractor's Address _____
Made by: Date _____
Checked by: Date _____

Commissioner's Representatives
(Resident Engineer) DDC
(Plumbing Inspector) DDC
(Heating & Ventilating Inspector) DDC
(Electrical Inspector) DDC

5. Contract Record Drawing Title Sheet: The Contractor must prepare a title sheet, the same size as the Contract Record Drawings, which must contain the following:

   a. Heading:
      The City of New York
      Department of Design and Construction
      Division of Public Buildings
   b. Capital Budget Project Number (FMS ID)
   c. Name and Location of Project
   d. Contractor's Name and Address
   e. Subcontractor's Name and Address (where applicable)
   f. Record of changes (a caption description of work affected, and the date and number of change order or other authorization)
   g. List of Record Drawings

B. Record Specifications, Addenda and Change Order: Submit to the Commissioner two (2) copies each of marked-up Record Specifications, Addenda and change orders.

C. Record Product Data: Submit to the Commissioner two (2) sets of Record Product Data.

D. Record Construction Photographs: Submit to the Commissioner final as-built construction photographs and digital files of the completed Work as described in Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION.

E. Operating and Maintenance Manuals:

1. Submit three (3) copies each of preliminary manuals to the Resident Engineer for review and approval. The Contractor must make such corrections, changes and/or additions to the manual until deemed satisfactory by the Resident Engineer. Deliver three (3) copies of the final approved manuals to the Resident Engineer for distribution.

2. Commissioning: Comply with the requirements of Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS and 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE, as well as the requirements set forth in sections of the Project Specifications, for projects designated for commissioning. Submit four (4) copies each of data designated to be included in the commissioning operation and maintenance manual to the Resident Engineer. The Resident Engineer will forward such data to the Commissioning Authority/Agent (CxA) for review and comment. The Contractor must make such corrections, changes and/or additions to the data until deemed satisfactory and deliver four (4) copies of the final data to the Resident Engineer for use by the CxA to prepare the commissioning operation and maintenance manual.

a. Non-Commissioning Data: All remaining data not designated for commissioning and required as part of maintenance and operation manual must be prepared and assembled in accordance with the requirements of this section for operating and maintenance manuals.

F. Final Site Survey: Submit Final Site survey as described in Section 01 73 00, EXECUTION, in quantities requested by the Commissioner, signed and sealed by a Land Surveyor licensed in the State of New York.

G. Guarantees and Warranties.

H. Waste Disposal Documents and Miscellaneous Record Documents.

PART II – PRODUCTS

2.1 CONTRACT RECORD DRAWINGS:

A. Record Prints: The Contractor must maintain one (1) set of blue- or black-line white prints as applicable of the Contract Record Drawings and Shop Drawings. If applicable, the Contract Record Drawings and Shop Drawings must incorporate the arrangement of the Work based on the accepted master coordination drawing(s) as described in Section 01 33 00, SUBMITTAL PROCEDURES.

1. Preparation: The Contractor must mark record drawings to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, Subcontractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an understandable drawing technique.
c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Change Orders: All changes from Contract Drawings must be distinctly encircled and identified by change order number correlating to changes listed on the "Title Sheet." The Contractor must show within the encircled areas the work as actually installed.

B. Content: Types of items requiring marking include, but are not limited to, the following:

1. Dimensional changes to Contract Record Drawings;
2. Revisions to details shown on Contract Record Drawings;
3. Depths of foundations below first floor;
4. Locations and depths of underground utilities;
5. Revisions to routing of piping and conduits;
6. Revisions to electrical circuitry;
7. Actual equipment locations;
8. Duct size and routing;
9. Locations of concealed internal utilities;
10. Changes made by change order;
11. Changes made following Commissioner’s written orders;
12. Details not on the original Contract Drawings;
13. Field records for variable and concealed conditions; and
14. Record information on the Work that is shown only schematically.

C. Progress Record Prints: As directed by the Resident Engineer, at fifty percent (50%) construction completion, review marked-up Record Prints with the Resident Engineer and the Design Consultant. When directed by the Resident Engineer, transfer progress mark-ups to a PDF set and submit to the Resident Engineer.

D. Final Contract Record Prints: Immediately before final inspection for the Certificate of Substantial Completion, review marked-up record prints with the Resident Engineer and the Design Consultant. When authorized, complete mark-up of a full set of corrected PDF prints of the Contract Drawings.

1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
2. Refer instances of uncertainty to Resident Engineer for resolution.
3. Submit the as-built Contract Record Drawings and Shop Drawings for use as record prints as described in Sub-Section 1.5.

2.2 RECORD SPECIFICATIONS, ADDENDA AND CHANGE ORDERS:

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, Addenda, and Contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record product data has been submitted in operation and maintenance manuals instead of submitted as record product data.
5. Note related change orders and Contract Record Drawings where applicable.
6. Upon completion of mark-up, submit two (2) complete copies of the marked-up record Specifications to the Commissioner.

2.3 RECORD PRODUCT DATA:

A. Preparation: Mark product data to indicate the actual product installation where installation varies substantially from that indicated in product data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project Site and changes in manufacturer's written instructions for installation.
3. If possible, a change order proposal should include resubmitting updated product data. This eliminates the need to mark up the previous submittal.
4. Note related change orders and Contract Record Drawings where applicable.
5. Upon completion of mark-up, submit to the Commissioner two (2) sets of the marked-up record product data.
6. Where record product data is required as part of maintenance manuals, submit marked-up product data as an insert in the manual instead of submittal as record product data.

2.4 RECORD SAMPLE SUBMITTAL:

A. Prior to the date of Substantial Completion, the Contractor must meet with the Resident Engineer at the Site to determine which of the samples maintained during the construction period must be transmitted to the Commissioner for record purposes.

B. Comply with the Resident Engineer's instructions for packaging, identification marking, and delivery to DDC. Dispose of other samples as specified for disposal of surplus and waste material.

2.5 CONSTRUCTION RECORD PHOTOGRAPHS:

A. The Contractor must submit the final completion construction photographs, in compliance with Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION.

2.6 OPERATING AND MAINTENANCE MANUALS:

A. The Contractor must provide preliminary and final versions of operating and maintenance manuals required for those systems, equipment, and materials listed in other Sections of the Project Specifications.

B. Format: Prepare and assemble operation and maintenance manuals in heavy-duty, 3-ring, hardback loose leaf binders in the form of an instructional manual. All binders for each discipline must be the same color. When multiple binders are used, correlate data into related consistent groupings. Binder front must contain permanently attached labels displaying the following:

1. Heading:
   The City of New York
   Department of Design and Construction
   Division of Public Buildings
2. Capital Budget Project Number (FMS ID)
3. Name and Location of Project
4. Contractor's Name and Address
5. Subcontractor's Name and Address (where applicable)
6. Dates of the Work covered by the contents of the Project Manual.
7. Binder spine must display Project Number (FMS ID) and date of completion.

C. Organization: Include a section in the directory for each of the following:

1. List of documents
2. List of systems
3. List of equipment
4. Table of contents

D. Each manual must contain the following materials, in the order listed:

1. Title page
2. Table of contents
3. Manual contents

E. Arrange contents alphabetically by system, subsystem, and equipment. Cross-reference Specification Section numbers. Provide tabbed flyleaf for each separate product, equipment and/or system/subsystem with typed description of product and major component parts of equipment.

F. Safety warnings or cautions must be visibly highlighted within each maintenance procedure. Use of such highlights must be limited to only critical items and must not be used in an excessive manner which would reduce their effectiveness.

G. For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts. Vendors and supplier listings are to include names, addresses and telephone numbers, including nearest field service telephone numbers.

H. Where contents of the manual include any manufacturer's catalog pages, clearly indicate the precise items and options included in the installation and delete all manufacturers' data regarding products not included in the installation.

I. All material within manuals must be new. Copies used for prior submittals or used in construction must not be used.

J. Submit preliminary and final manual editions to the Commissioner according to the approved progress schedule.

K. Manuals must present all technical material to the greatest extent possible, with respect to text, tabular matter and illustrations. Illustrations must preferably consist of line drawings. All applicable drawings must be included. If available, color photograph prints may be included.

L. Preliminary manual editions must be as technically complete as the final manual edition. All illustrations must be in final forms.

M. Final manual editions must be technically accurate and complete and must represent all "as-built" systems, pieces of equipment, or materials, which have been accepted by the Commissioner. All illustrations, text and tabular material must be in final form. All shop drawings must be included as specified in individual Specification Sections.

N. Building products, applied materials, and finishes: Include product data, with catalog number, size, composition, and color texture designations. Where applicable, provide information for re-ordering custom manufactured products.

O. Instructions for care and maintenance: Include manufacturers' recommendations for cleaning agents and methods, and recommended schedule for cleaning and maintenance.

P. Moisture protection and weather exposed products: Include product data listing applicable reference standards, chemical compositions, and details of installation. Provide recommendations for inspections, maintenance, and repair.

Q. Additional requirements: Specified in individual Specification Sections.

2.7 FINAL SITE SURVEY

A. The Contractor must submit the final certification and final survey in compliance with Section 01 73 00 EXECUTION.

2.8 DEMONSTRATION AND ORIENTATION DVD:

A. The Contractor must submit a final version of applicable demonstration and training electronic recordings in compliance with Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

2.9 GUARANTEES AND WARRANTIES:

A. SCHEDULE B: Requirements for guarantees and warranties for the Project are set forth in Schedule B, which is included as part of the Addendum.

B. FORM: For all guaranty requirements set forth in Schedule B, the Contractor must provide a written guaranty, in the form set forth herein.

C. Submit fully executed and signed manufacturers' warranties as listed in the Project Specifications and outlined in Schedule B of the Addendum. Refer to Section 01 77 00, CLOSEOUT PROCEDURES for submittal requirements.

GUARANTY

DDC PROJECT # _____

PROJECT DESCRIPTION _____

_____

CONTRACT # _____

SPECIFICATION SECTION # AND TITLE _____

_____

GUARANTY TO BE IN EFFECT FROM _____

TO _____

The Contractor hereby guarantees that the Work specified under the above section of the aforesaid Contract will be free from defects of material and/or workmanship, for the period indicated above.

The Contractor also guarantees that it will promptly repair, restore, rebuild or replace whichever may be deemed necessary by the City, any or all defective material or workmanship of the aforementioned section, that may appear within the guaranty period and any finished Work to which damage may occur because of such defects, to the satisfaction of the City and without any cost or expense to the City.

The Contractor hereby agrees to pay to the City the cost of the repairs or replacements should the City make the same because of the failure of the Contractor to do so.

Contractor: _____

By: _____
Signature of Partner or Corporate Officer

Print Name: _____

Subscribed and sworn to before me this
day of _____ , year _____

_____
Notary Public

2.10 WASTE DISPOSAL DOCUMENTATION:

A. Certify and deliver to the Commissioner all documentation including reports, receipts, certificates, records etc. for the collection, handling, storage, classification, testing, transportation, recycling and/or disposal of all Non-Hazardous Construction Waste as required by Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL, and Hazardous Waste as required by other Project Specification Sections. Certify compliance with all applicable governing laws, codes, rules and regulations.

2.11 MISCELLANEOUS RECORD DOCUMENTS:

A. Refer to other Project Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Prior to Final Acceptance, complete miscellaneous records and place in good order, properly identified and bound or otherwise organized to allow for use and reference.

B. Submit three (3) copies of each document to the Commissioner or as otherwise directed by the Commissioner.

PART III – EXECUTION

3.1 RECORDING AND MAINTENANCE:

A. Recording: Maintain one (1) copy of each submittal during the construction period for Contract Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of the Project.

B. Maintenance of Record Documents and Samples: Store Contract Record Documents and samples in the field office apart from the Contract Documents used for construction. Do not use Contract Record Documents for construction purposes. Maintain Contract Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to the Contract Record Documents for the Resident Engineer's reference during normal working hours.

END OF SECTION 01 78 39

SECTION 01 79 00
DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 79 00

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and procedural requirements, when set forth in sections of the Project Specifications, for instructing the facility's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Owner's pre-acceptance orientation in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and orientation video recordings.

B. The Contractor must provide the services of orientation specialists from the Contractor's equipment manufacturers. The specialists must be experienced in the type of equipment to be demonstrated.

C. Separate orientation sessions must be conducted for mechanical operations and maintenance personnel and for electronic and electrical maintenance personnel.

D. Commissioning: Refer to the Addendum to identify whether this project is to be commissioned. For commissioned projects, the Contractor must provide demonstration and orientation as described in this section and cooperate with the Commissioning Authority/Agent (CxA) to implement commissioning requirements as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS, and/ or Section 01 91 15 BUILDING ENCLOSURE COMMISSIONNING REQUIREMENTS.

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 77 00 CLOSEOUT PROCEDURES
D. Section 01 78 39 CONTRACT RECORD DOCUMENTS
E. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS
F. Section 01 91 15 BUILDING ENCLOSURE COMMISSIONNING REQUIREMENTS
G. Specific requirements for demonstration and orientation indicated in other sections of the Project Specifications.

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	Definition
Commissioning Authority / Commissioning Agent (CxA)	The entity responsible for providing commissioning services for the Project. The entity serving as the CxA may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the Design Consultant may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBMITTALS:

A. Instruction Program: Submit three (3) copies of an outline of the instructional program for demonstration and orientation, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each orientation module to the Commissioner for approval no less than thirty (30) Days prior to the date the proposed orientation is to take place. Include learning objectives and outline for each orientation module.

1. At completion of orientation, submit three (3) complete training manual(s) and three (3) applicable video recording(s) to the Commissioner for the facility's and City's use.

B. Qualification Data: For facilitator, instructor and videographer.

C. Attendance Record: For each orientation module, submit a list of participants and length of instruction time.

D. Evaluations: For each participant and for each orientation module, submit results and documentation of performance-based test.

E. Submit all final orientation materials to the Resident Engineer a minimum of fourteen (14) Days prior to the scheduled orientation.

F. Demonstration and Orientation Recordings:

1. All Projects:

a. The Contractor must submit to the Commissioner three (3) copies of demonstration and orientation video recordings within seven (7) Days of end of each orientation module.

b. Identification: On each copy, provide an applied label with the following information:

1) Project Contract I.D. Number
2) Project Contract Name
3) Name of Contractor
4) Name of Subcontractor as applicable
5) Name of Design Consultant
6) Name of Construction Manager as applicable
7) Date recorded

8) Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
9) Table of Contents including list of systems covered.

c. Transcript: Prepared on 8-1/2-by-11-inch paper, punched and bound in heavy-duty, 3-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding DVD recording. Include name of Project and date of recording on each page.

d. Commissioned Projects: The Contractor must submit one (1) additional copy of the demonstration and orientation video recording to the CxA through the Resident Engineer who will include the approved recording in the commissioning report.

1.6 QUALITY ASSURANCE:

A. Facilitator Qualifications: A firm or individual experienced in orientation or educating maintenance personnel in an orientation program similar in content and extent to that indicated for this Project.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 QUALITY REQUIREMENTS, experienced in operation and maintenance procedures and orientation.

C. Videographer Qualifications: A professional videographer who has experience with orientation and construction projects.

D. Pre-Instruction Conference: Schedule with the Resident Engineer a conference at Project Site in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION. Review methods and procedures related to demonstration and orientation including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.7 COORDINATION:

A. Coordinate instruction schedule with the Resident Engineer and facility’s operations. Adjust schedule as required to minimize disrupting facility’s operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of orientation modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by the Commissioner.

PART II – PRODUCTS

2.1 INSTRUCTION PROGRAM:

A. Program Structure: Develop an instruction program that includes individual orientation modules for each system and equipment not part of a system, as specified and required by individual Specification Sections.

B. Orientation Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:

1. For basis of system design, operational requirements, and criteria, include the following:
   a. System, subsystem, and equipment descriptions;
   b. Performance and design criteria if Contractor is delegated design responsibility;
   c. Operating standards;
   d. Regulatory requirements;
   e. Equipment function including auxiliary equipment and systems;
   f. Operating characteristics;
   g. Limiting conditions; and
   h. Performance curves.

2. For documentation, review the following items in detail:
   a. Emergency manuals;
   b. Operations manuals;
   c. Maintenance manuals;
   d. Project Record Documents;
   e. Identification systems; and
   f. Warranties.

3. For emergencies, include the following, as applicable:
   a. Instructions on meaning of warnings, trouble indications, and error messages;
   b. Instructions on stopping;
   c. Shutdown instructions for each type of emergency;
   d. Operating instructions for conditions outside of normal operating limits;
   e. Sequences for electric or electronic systems; and
   f. Special operating instructions and procedures.

4. For operations, include the following, as applicable:
   a. Startup procedures;
   b. Equipment or system break-in procedures;
   c. Routine and normal operating instructions;
   d. Regulation and control procedures;
   e. Control sequences;
   f. Safety procedures;
   g. Instructions on stopping;
   h. Normal shutdown instructions;
   i. Operating procedures for emergencies;
   j. Operating procedures for system, subsystem, or equipment failure;
   k. Seasonal and weekend operating instructions;
   l. Required sequences for electric or electronic systems; and
   m. Special operating instructions and procedures.

5. For adjustments, include the following:
   a. Alignments;
   b. Checking adjustments;
   c. Noise and vibration adjustments; and
   d. Economy and efficiency adjustments.

6. For troubleshooting, include the following:
   a. Diagnostic instructions; and
   b. Test and inspection procedures.
7. For maintenance, include the following:
   a. Inspection procedures;
   b. Types of cleaning agents to be used and methods of cleaning;
   c. List of cleaning agents and methods of cleaning detrimental to product;
   d. Procedures for routine cleaning;
   e. Procedures for preventive maintenance;
   f. Procedures for routine maintenance;
   g. Instruction on use of special tools; and
   h. Housekeeping practices.
8. For repairs, include the following:
   a. Diagnosis instructions;
   b. Repair instructions;
   c. Disassembly, component removal, repair, and replacement; and reassembly instructions;
   d. Instructions for identifying parts and components; and
   e. Review of spare parts needed for operation and maintenance.

PART III – EXECUTION

3.1 INSTRUCTION:

A. Facilitator: Engage a qualified facilitator to prepare the instruction program and orientation modules, to coordinate instructors, and to coordinate between Contractor and the Resident Engineer for the number of participants, instruction times, and location.

B. The Contractor must engage qualified instructors to instruct the facility's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

C. Scheduling: Schedule instruction with the Resident Engineer at mutually agreed upon times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.

   1. Schedule orientation with the Resident Engineer with at least fourteen (14) Days advance notice.

D. Evaluation: At the conclusion of each orientation module, assess and document each participant's mastery of module(s) by use of an oral or written demonstration performance-based test.

E. Cleanup: Collect and remove used and leftover educational materials from Project Site. Remove instructional equipment. Restore systems and equipment to condition existing before initial orientation use.

3.2 DEMONSTRATION AND ORIENTATION VIDEO RECORDINGS:

A. All projects:

   1. The Contractor must engage a qualified commercial videographer to video record demonstration and orientation sessions. Record each orientation module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
   2. At the beginning of each orientation module, record each chart containing learning objective and lesson outline.
   3. All recordings must be close-captioned.

4. Recording Format: Provide high-quality video recording on USB drive or other electronic media as requested by the Commissioner.

5. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and orientation. Display continuous running time.

6. Narration: Describe scenes on the recording by audio narration by microphone while recording or by dubbing audio narration off-site after. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

7. Transcript: Provide a typewritten transcript of the narration. Display images and running time captured from opposite the corresponding narration segment.

B. Commissioned Projects: Refer to the Addendum to determine if the project is to be commissioned.

1. The Commissioning Authority/Agent (CxA) under separate contract with the City of New York will assess and comment on the adequacy of the orientation instruction sessions by reviewing the orientation and instruction program and agenda provided by the Contractor. The provider of the orientation program will video record the sessions and provide a copy to the CxA for final review and comments. If necessary, Contractor must edit the recording per CxA comments.

END OF SECTION 01 79 00

SECTION 01 81 13.03
SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.03

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. LEED BUILDING - GENERAL REQUIREMENTS**:**

The City of New York is committed to implementing good environmental practices and procedures which include achieving a LEED™ Green Building rating. Specific project requirements related to this goal are listed in the applicable paragraphs of this section of the General Conditions. The Contractor must ensure that these requirements, as defined in the sections below and in related sections of the Contract Documents, are implemented to the fullest extent. Substitutions, or other changes to the work proposed by the Contractor or their Subcontractors, will not be allowed if such changes compromise the stated LEED BUILDING criteria.

B. This Section includes:

1. Definitions
2. LEED Provisions
3. LEED Building Submittals
4. LEED Building Submittal Requirements
5. LEED Action Plan

1.3 RELATED SECTIONS: Include without limitation the following:

A.	Section 01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
B.	Section 01 81 13.13	VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS
C.	Section 01 81 19	INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS
D.	Section 01 91 13	GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS
E.	Section 01 91 15	GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Agrifiber Products	Means products derived from recovered agricultural waste fiber from sources such as cereal straw, sugarcane bagasse, sunflower husk, walnut shells, coconut husks, and agricultural prunings, processed and mixed with resins to produce panels with characteristics similar to composite wood.
Composite Wood	Means products composed of wood or plant particles or fibers bonded by a synthetic resin or binder to produce panels such as plywood, particleboard, and medium density fiberboard (MDF). Does not include hardboard, structural panels, glued laminated timber, prefabricated wood I-joists, or finger-jointed lumber.
Design Consultant	Means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Forest Stewardship Council (FSC) Certified Wood	Means wood-based materials and products certified in accordance with the Forest Stewardship Council's principles and criteria.
LEED	Means the Leadership in Energy & Environmental Design rating system developed by the United States Green Building Council.
Rapidly Renewable Materials	Means materials made from agricultural products that are typically harvested within a ten-year or shorter cycle. Rapidly renewable materials include products made from bamboo, cotton, flax, jute, straw, sunflower seed hulls, vegetable oils, or wool.
Regionally Manufactured Materials	Means materials that are manufactured within a radius of 500 miles from the Project location. Manufacturing refers to the final assembly of components into the building product that is installed at the Project site.
Regionally Extracted, Harvested, or Recovered Materials	Means materials which are extracted, harvested, or recovered and manufactured within a radius of 500 miles from the Project site.
Recycled Content	Means The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer). Spills and scraps from the original manufacturing process that are combined with other constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials. "Pre-consumer" may also be referred to as "post-industrial".
Solar Reflectance Index (SRI)	A measure of a material's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is equal to 0, and a standard white (reflectance 0.80, emittance of 0.90) is equal to 100.

Volatile Organic Compound (VOC)	Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs.

1.5 LEED PROVISIONS:

A. Refer to the Addendum for the LEED rating to be achieved for this project. The provisions to achieve this LEED rating are integrated within the project construction documents and specifications. The Contractor is specifically directed to the "LEED BUILDING Performance Criteria" and "LEED BUILDING Submittals" sections within the contract specification. Additional LEED requirements are met through aspects of the project design, including material and equipment selections, which may not be specifically identified as LEED BUILDING requirements. Compliance with the requirements needed to obtain LEED prerequisites and credits will be used as one criterion to evaluate substitution requests.

1.**6 LEED BUILDING SUBMITTALS:**

A. Scope: LEED BUILDING submittals are required for all installed materials included in General Construction work. LEED BUILDING Submittals are only required for field-applied adhesives, sealants, paints and coatings included in Plumbing, Mechanical and Electrical work. Submit all required LEED BUILDING submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. Applicability: The extent of the LEED BUILDING Submittals varies depending on the specification section. Applicable LEED BUILDING Submittals are listed under the "LEED BUILDING Submittals" heading in each specification section. The detailed requirements for the LEED BUILDING Submittals are defined in Item C below.

C. Detailed Requirements: Sub-Sections 1.6 C.1through 1.6 C.3 below defines the information and documents to be provided for each type of LEED BUILDING Submittal as identified in the LEED Submittal Requirements of each specification section:

1. ENVIRONMENTAL BUILDING MATERIALS CERTIFICATION FORM (EBMCF)[GHI]: Information to be supplied for this form (blank sample copy attached at end of this Section to be modified as appropriate to the project) must include some or all of the following items, as identified in the LEED Submittal Requirements of each specification section:

   a. Cost breakdowns for the materials included in the contractor or sub-contractor's scope of work. Cost reporting must include itemized material costs (excluding the contractor's labor, equipment, overhead and profit).

   b. The percentages (by weight) of post-consumer and/or post-industrial recycled content in the supplied product(s).

      1) For each product with recycled content, also indicate the total recycled content value (1/2 x pre-consumer percentage x product value + 1 x post-consumer percentage x product value = total recycled content value).
      2) See additional requirements for concrete below.

   c. Identification (Yes/No) of materials manufactured within 500 miles of the project site AND containing raw materials harvested or extracted within 500 miles of the project site.

      1) Indicate the percentage by weight, relative to the total weight of the product that meets these criteria.
      2) Indicate the point of harvest/extraction/recovery of regional raw materials, the point of final assembly of regional manufactured products, and the distance from each point to the project site.

d. Volatile Organic Compound (VOC) content of all field-applied adhesives, sealants, paints, and coatings, listed in grams/liter or lbs./gallon, less water.

1) For detailed requirements refer to Section 01 81 13.13 VOC LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS.

e. The amount of “Forest Stewardship Council (FSC) Certified” wood products if used in the Project.

1) Record only new FSC-certified wood products. Do not record reclaimed, salvaged, or recycled FSC-certified wood products.
2) Reclaimed, salvaged, or recycled FSC-certified wood may be recorded as post-consumer recycled content.

f. The amount of Rapidly Renewable materials if used in the Project.

1) Indicate the type of rapidly renewable material used, and the percentage by weight, relative to the total weight of the product, that consists of rapidly renewable material.

g. The percentage (by weight), relative to the total weight of cementitious materials, of supplementary cementitious materials or pozzolans such as fly ash used in each concrete mix used in the Project.

1) For each concrete mix, provide a complete breakdown of all components, by weight and by cost.

h. Identification (Yes/No) of composite wood or agrifiber products used in the project that are free of added urea-added formaldehyde resins.

i. Identification (Yes/No) of flooring products used in the project that have Carpet and Rug Institute (CRI) Green Label or Green Label Plus certification, or Resilient Floor Covering Institute FloorScore certification.

1) Untreated solid wood flooring, and mineral-based flooring products such as tile, masonry, terrazzo, and cut stone that have no organic-based coatings or sealants, are excluded from this requirement.

j. The EBMCF must record the above information only for those materials or products permanently installed in the project. The EBMCF must record VOC content, composite and agrifiber products, and CRI or FloorScore ratings only for those materials or products permanently installed within the weather barrier of the LEED building.

2. EBMCF BACK-UP DOCUMENTATION: These documents are used to validate the information provided on the EBMCF (except cost data). For each material listed on the EBMCF, provide documentation to certify the material’s LEED BUILDING attributes, as applicable:

a. RECYCLED CONTENT: Provide published product literature or letter of certification on the manufacturer’s letterhead certifying the amounts of post-consumer and/or post-industrial content.

b. REGIONAL MANUFACTURING AND REGIONAL RAW MATERIALS (WITHIN 500 MILES): Provide published product literature or letter of certification on the manufacturer’s letterhead indicating the city/state where the manufacturing plant is located, where each of the raw materials in the product were extracted, harvested or recovered and the distance in miles from the project site.

1) If only some of the raw materials for a particular product or assembly originate within 500 miles of the project site, provide the percentage (by weight) that these materials comprise in the complete product.

c. VOC CONTENT: Provide Material Safety Data Sheets (MSDS) certifying the Volatile Organic Compound (VOC) content of the adhesive, sealant, paint, or coating products. VOC content is to be reported in grams/liter or lbs./gallon, less water. If the MSDS does not show the product's VOC content, this information must be provided through other published product literature from the manufacturer, or stated in a letter of certification from the product manufacturer on the manufacturer's letterhead.

d. RAPIDLY RENEWABLE MATERIALS: If used in the project, provide published literature or letter of certification on the manufacturer's letterhead certifying the percentage of each product that is rapidly renewable (by weight).

3. PRODUCT CUT SHEETS: Provide product cut sheets with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project.

4. CRI GREEN LABEL PLUS CERTIFICATION: For carpets and carpet cushions, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the products comply with the "Green Label Plus" IAQ testing program of the Carpet and Rug Institute of Dalton, GA.

5. CERTIFICATION OF COMPOSITE WOOD OR AGRIFIBER RESINS: For all composite wood, engineered wood and agrifiber products (including plywood, particleboard, and medium density fiberboard), provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that that the products do not contain added urea-formaldehyde resins.

6. CERTIFICATION OF COMPOSITE WOOD OR AGRIFIBER LAMINATING ADHESIVES: For all laminating adhesives used with composite wood, engineered wood and agrifiber products (e.g., adhesives used to laminate wood veneers to an engineered wood substrate), provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the adhesive products do not contain urea-formaldehyde.

7. FSC-CERTIFIED WOOD:

   a. If used in the project, provide chain of custody documents and copies of invoices regarding wood products, including whether or not such wood product is FSC-certified.

   b. If used in the project, for assemblies, provide the percentage (by cost and by weight) of the assembly that is FSC-certified wood.

   c. If used in the project, for assemblies, provide published product literature or letter from the manufacturer(on the manufacturer's letterhead) verifying the percentage that is FSC-certified wood.

8. GREEN SEAL COMPLIANCE: Provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the following product types comply with the VOC limits and chemical component restrictions developed by the Green Seal organization of Washington, DC:

   a. Interior Architectural Paints and Coatings: refer to Green Seal standard GS-11 (1st edition, May 1993)

   b. Anti-corrosive and Anti-rust paints: refer to Green Seal standard GC-03 (2nd Edition, January 1997)

   c. Aerosol Adhesives: refer to Green Seal standard GS-36 (1st edition, October 2000)

9. HIGH ALBEDO PAVING AND WALKWAY MATERIALS: For paving and walkway materials made from concrete or brick provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying a minimum Solar Reflectance Index (SRI) value of 29. SRI

values will be calculated according to ASTM E 1980. Reflectance will be measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance will be measured according to ASTM E 408 or ASTM C 1371.

10. HIGH ALBEDO ROOFING MATERIALS: For exposed roofing membranes, pavers, and ballast products, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the following minimum Solar Reflectance Index (SRI) values:

    a. 78 for low-sloped roofing applications (slope ≤ 2:12)

    b. 29 for steep-sloped roofing applications (slope > 2:12)

    SRI values will be calculated according to ASTM E 1980. Reflectance will be measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance will be measured according to ASTM E 408 or ASTM C 1371.

    Vegetated roof surfaces are exempt from the SRI criteria.

11. LOW MERCURY LAMPS: For all fluorescent, compact fluorescent, and HID lamps installed in the project, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying:

    a. The mercury content or content range per lamp in milligrams or picograms;

    b. The design light output per lamp (light at 40% of a lamp’s useful life) in lumens; and

    c. The rated average life of the lamp in hours.

    In addition, provide the total number of each lamp type installed in the project.

12. FLOORSCORE CERTIFICATION: For all hard surface flooring, including vinyl, linoleum, laminate flooring, wood flooring, ceramic flooring, rubber flooring, and wall base, provide published product literature or letter from the manufacturer (on the manufacturer’s letterhead) verifying that the products comply with the current FloorScore standard requirements.

13. CONCRETE: Provide concrete mix design for each mix, designated by a distinct identifying code or number and signed by a Professional Engineer licensed in the state in which the concrete manufacturer or supplier is located.

14. INTERIOR LIGHTING FIXTURES: For each lighting fixture type installed within the building’s weather barrier, provide manufacturer’s cut sheets indicating the following:

    a. Fixture power in watts.

    b. Initial lamp lumens.

    c. Photometric distribution data.

    d. Dimming capability, in range of percentages.

15. EXTERIOR LIGHTING FIXTURES: For each lighting fixture type installed on site, provide manufacturer’s cut sheets indicating the following:

    a. Fixture power in watts.

    b. Initial lamp lumens.

    c. Photometric distribution data.

    d. Range of field adjustability, if any.

    e. Warranty of suitability for exterior use.

16. ALTERNATIVE TRANSPORTATION: Provide manufacturer's cut sheets and/or shop drawings for the following items installed on site:
    a. Bike racks, including total number of bicycle slots provided.
    b. Signage indicating parking spaces reserved for electric or low-emitting vehicles and for carpools/vanpools, including total number of signs.
17. WATER CONSERVING FIXTURES: For all water consuming plumbing fixtures and fittings, provide manufacturer's cut sheets showing maximum flow rates and/or flush rates.
18. ENERGY SAVING APPLIANCES: Provide manufacturer's cut sheets and published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the product's rating under the U.S. EPA/DOE Energy Star program, for all of the following:
    a. Appliances (i.e., refrigerators, dishwashers, microwave ovens, televisions, clothes washers, clothes dryers, chilled water dispensers).
    b. Office equipment (i.e., copy machines, fax machines, plotters/printers, scanners, binding and publishing equipment).
    c. Electronics (i.e., servers, desktop computers, computer monitor displays, laptop computers, network equipment).
    d. Commercial food service equipment
19. GLAZING: For glazing in any windows, doors, storefront and window wall systems, curtainwall systems, skylights, and partitions, provide manufacturer's cut sheets indicating the following:
    a. Glazed area.
    b. Visible light transmittance.
    c. Solar heat gain coefficient.
    d. Fenestration assembly u-factor.
20. VENTILATION: Provide manufacturer's cut sheets for the following:
    a. Carbon dioxide monitoring systems, if any, installed to measure outside air delivery.
    b. Air filters: for detailed requirements refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS.
21. REFRIGERATION: For all refrigeration equipment, provide manufacturer's cut sheets indicating the following:
    a. Equipment type.
    b. Equipment life. Default values specified by the 2007 ASHRAE Applications Handbook will be used unless otherwise demonstrated by the manufacturer's guarantee and an equivalent long-term service contract.
    c. Refrigerant type.
    d. Refrigerant charge in pounds of refrigerant per ton of gross cooling capacity.
    e. Tested refrigerant leakage rate, in percent per year. A default rate of 2% will be used unless otherwise demonstrated by test data.
    f. Tested end-of-life refrigerant loss, in percent. A default rate of 10% will be used unless otherwise demonstrated by test data.

1.7 LEED BUILDING SUBMITTAL REQUIREMENTS:

A. The LEED BUILDING Submittal information must be assembled into one package per contract specification section(s) (or per Subcontractor), and submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. Incomplete or inaccurate LEED BUILDING submittals may be used as the basis for the rejection of products or assemblies. Incomplete or inaccurate LEED BUILDING Submittals may be used as the basis for rejecting the submitted products or assemblies.

1.8 LEED ACTION PLANS:

A. Construction Waste Management Plan- Refer to Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for detailed submittal requirements.

B. Construction IAQ Management Plan- Refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS for detailed submittal requirements.

C. Erosion and Sedimentation Control Plan:

1. The Plan must be in accordance with the New York State Department of Environmental Conservation (NYSDEC) or the 2003 EPA Construction General Permit, whichever is more stringent.

2. The Plan must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEEDURES.

3. Detailed requirements: ESC Plan

   a. Include the Stormwater Pollution Prevention Plan, if required.

   b. Identify the party responsible for Plan monitoring and documentation. The party must be regularly on site.

   c. Describe all site work that will be implemented on the project.

   d. Provide site plan with location of ESC measures, including, but not limited to, stormwater quantity controls, stormwater quality controls, stabilized construction entrances, washdown areas, and inlet/catch basin protection.

   e. Describe the inspection and maintenance of the ESC measures. Provide a construction schedule indicating weekly site review.

   f. Describe reporting and documentation measures.

4. Detailed requirements: ESC Measures

5. Submittal requirements: ESC Tracking Log

   a. Note date of major rain events, describe damage, describe any repairs or maintenance performed, and note responsible party.

   b. Note date and findings of weekly site review, describe any repairs or maintenance performed, and note responsible party.

   c. Submit monthly.

6. Implementation

   a. The Contractor must implement the ESC Plan, coordinate the Plan with all affected trades, and designate one individual as the Erosion and Sedimentation Control Representative, who will be responsible for communicating the progress of the Plan with the Commissioner on a regular basis, and for assembling the required LEED documentation.

b. The Contractor must be responsible for the provision, maintenance, and repair of all ESC measures.

c. Demonstration. The Contractor must provide on-site instruction of proper construction practices required to prevent erosion and sedimentation.

d. Meetings. Urgent or ongoing ESC issues will be discussed at weekly on-site job meetings.

1.9 QUALITY ASSURANCE:

A. The Contractor must implement all LEED Action Plans, coordinate the Plans and LEED Building Submittals with all affected trades, and designate one individual as the Sustainable Construction Representative at no additional cost to the City of New York, who will be responsible for communicating the progress of LEED activities with the Commissioner on a regular basis, and for assembling the required LEED documentation.

B. Responsibilities of Contractor's Subcontractors: The Contractor is responsible for its Subcontractors complying with the LEED Action Plans and for providing required LEED documentation as required for the project.

C. Distribution and Compilation: The Contractor is responsible for distributing the EBMCF and any other forms or templates required for the Subcontractors to record LEED documentation. The Contractor also be responsible for collecting and compiling EBMCF information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.

D. Meetings: Sustainable design and construction issues must be discussed at the following meetings:

1. Demolition kick-off meeting
2. Construction kick-off meeting
3. Construction kick-off meeting for LEED (independent meeting)
4. Weekly job-site progress and coordination meetings
5. Closeout meeting

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.03

ENVIRONMENTAL BUILDING MATERIALS CERTIFICATION FORM

Contractor Name: _____
Contractor Contact: _____
Telephone Number: _____

Project Name: _____
Project I.D.: _____

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 regarding as if they induce heritable mutations in the germ cells of humans, under the Harmonized System for the Classification of Chemicals Which Cause Mutations in Germ Cells (United Nations Economic Commission for Europe, Globally Harmonized System of Classification and Labeling of Chemicals).
Ozone-Depleting Compounds	A compound with an ozone-depletion potential greater than 0.1 (CFC 11=1) according to the U.S. EPA list of Class I and Class II Ozone-Depleting Substances.
Paint	A pigmented coating. For the purposes of this specification, paint primers are considered to be paints. A. Flat Coating or Paint: Has a gloss of less than 15 (using an 85-degree meter) or less than 5 (using a 60-degree meter). B. Non-Flat Coating or Paint: Has a gloss of greater than or equal to 15 (using an 85-degree meter) or greater than or equal to 5 (using a 60-degree meter). C. Non-Flat High-Gloss Coating or Paint: Has a gloss of greater than or equal to 70 (using a 60-degree meter). Anti-Corrosive / Rust Preventative Paint: Coating formulated and recommended for use in preventing the corrosion of ferrous metal substrates.
Permanently Installed Building Product	See Product.
Primer	Coating that is formulated and recommended for one or more of the following purposes: to provide a firm bond between the substrate and a subsequent coating; to prevent a subsequent coating from being absorbed into the substrate; to prevent harm to a subsequent coating from materials in the

	substrate; or to provide a smooth surface for application of a subsequent coating.
Product	An item that arrives on the Project site either as a finished element ready for installation or as a component to another item assembled on-site. The product unit is defined by the functional requirement for use in the Project; this includes the physical components and services needed to serve the intended function of the permanently installed building product. Similar products within a specification will each contribute as a separate product.
Product-Specific Declaration	Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle-to-gate scope.
Recycled Content	The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer) or after consumer use (post-consumer). Recycled content claims for products must conform to the definition in ISO 14021-1999, Environmental Labels and Declarations, Self-Declared Environmental Claims (Type II Environmental Labeling). Spills and scraps from the original manufacturing process that are combined with other constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials. “Pre-consumer” may also be referred to as “post-industrial”.

Regionally Manufactured Materials	Materials that are manufactured, distributed and purchased within a radius of 100 miles from the Project location. Manufacturing refers to all points of manufacture for an assembly of components.
Regionally Extracted, Harvested, or Recovered Materials	Materials which are extracted, harvested or recovered, manufactured, distributed and purchased within a radius of 100 miles from the Project site.
Reproductive Toxin	A chemical listed as a reproductive toxin (including developmental, female, and male toxins) by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Code of Regulations, Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, et. Seq.).
Sanding Sealer	Clear/semi-transparent coating formulated to seal bare wood. Can be abraded to create a smooth surface for subsequent coatings. Does not include sanding sealers that are lacquers (see Clear Wood Finish above).
Sealant	Any material with adhesive properties, formulated primarily to fill, seal, or waterproof gaps or joints between surfaces. Includes sealant primers and caulks.
Shellac	Clear or pigmented coating formulated solely with the resinous secretions of the lac beetle, thinned with alcohol and formulated to dry by evaporation without chemical reaction. Excludes floor applications.
Solar Reflectance Index (SRI)	A measure of a material's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is equal to 0, and a standard white (reflectance 0.80, emittance of 0.90) is equal to 100.
Stain	Clear semi-transparent/opaque coating formulated to change the color but not conceal the grain pattern or texture of the substrate.
Varnish	Clear/semi-transparent coating, excluding lacquers and shellacs, formulated to dry by chemical reaction on exposure to air. May contain small amounts of pigment.

Volatile Aromatic Compound	Any hydrocarbon compound containing one or more 6-carbone benzene rings, and having an initial boiling point less than or equal to 280 degrees Celsius measured at standard conditions of temperature and pressure.
Volatile Organic Compound (VOC)	Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs.Waterproofing Sealer: A coating that prevents the penetration of water into porous substrates.

1.5 LEED PROVISIONS:

A. Refer to the Addendum for the LEED rating to be achieved for this Project. The provisions to achieve this LEED rating are integrated within the Project construction documents and specifications. Additional LEED requirements are met through aspects of the Project design, including material and equipment selections, which may not be specifically identified as LEED Building requirements. Compliance with the requirements needed to obtain LEED prerequisites and credits will be used as one criterion to evaluate substitution requests.

1.**6 LEED BUILDING SUBMITTALS:**

A. Scope: LEED Building Submittals are required for all permanently installed materials included in General Construction work. For Plumbing, Mechanical and Electrical work, LEED Building Submittals are only required for field-applied adhesives, sealants, paints and coatings. Voluntary inclusion of system components such as piping, pipe insulation, ducts, conduits, plumbing fixtures, faucets and lamp housings must be consistently applied to the Project's LEED credits. Submit all required LEED Building Submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. Applicability: The extent of the LEED Building Submittals varies depending on the specification section. Applicable LEED Building Submittals are listed under the "LEED Building Submittals" heading in each specification section. The detailed requirements for the LEED Building Submittals are defined in Sub-Section 1.6 C below.

C. Detailed Requirements: Sub-Sections 1.6 C.1 through 1.6 C.18 below define the information and documents to be submitted for each type of LEED Building Submittal as identified in the LEED Building Submittals heading in each specification section:

1. LEED v4 Material and Resources (MR) Credits Calculator for Building Product Disclosure and Optimization (Disclosure and Optimization Calculator): With each submittal of a product permanently installed in the Project, the Contractor is responsible for the completion of the

Disclosure and Optimization Calculator, which can be found on USGBC's website. The Contractor must maintain an updated Disclosure and Optimization Calculator for all applicable products throughout the Project duration and submit the updated calculator on a monthly basis.

a. The Disclosure and Optimization Calculator will record the information outlined in Items b.-c. below for all permanently installed products, the information outlined in Item d. below for all permanently installed concrete mixes, and the information outlined in Items e.-i. below for all permanently installed products that have the content, disclosure or optimization characteristics described herein:
b. Cost breakdowns for the materials included in the Contractor or Subcontractor's scope of work. Cost reporting must include itemized material costs (excluding the Contractor's labor, equipment, overhead and profit).
c. The percentages (by weight) of post-consumer and/or post-industrial recycled content in the supplied product(s).
    1) For each product with recycled content, also indicate the total recycled content value (1/2 x pre-consumer percentage x product value + 1 x post-consumer percentage x product value = total recycled content value).
    2) See additional requirements for concrete in section 1.6.C.1.d below.
d. The percentage (by weight), relative to the total weight of cementitious materials, of supplementary cementitious materials or pozzolans such as fly ash used in each concrete mix used in the Project.
    1) For each concrete mix, submit a complete breakdown of all components, by weight and by cost.
e. Identification (Yes/No) of materials manufactured, distributed and purchased within 100 miles of the Project site AND containing raw materials harvested or extracted within 100 miles of the Project site, if used in the Project, as well as the following information:
    1) Indicate the percentage by weight, relative to the total weight of the product that meets these criteria.
    2) Indicate the point of harvest/extraction/recovery of regional raw materials, the point of final assembly of regional manufactured products, and the distance from each point to the Project site.
f. The percentage (by cost) of "Forest Stewardship Council (FSC) Certified" wood products, if used in the Project.
    1) Record all new wood products, indicating which are FSC-certified. Do not record reclaimed, salvaged, or recycled FSC-certified wood products.
    2) Reclaimed, salvaged, or recycled FSC-certified wood may be recorded as post-consumer recycled content.
g. The number or percentage of products with Environmental Product Declarations (EPD), with fractional or multiplied values as indicated below. If a product used in the Project has an EPD Declaration, submit one of the following:
    1) EPD:
        i. Product-Specific Declaration: Valued as one quarter (1/4) of a product
        ii. Industry-Wide (Generic) EPD: Valued as one half (1/2) of a product
        iii. Product-Specific Type III EPD: Valued as one whole product
    2) Documentation of third-party certification of impact reduction below industry average for at least three of the following categories, valued at 100%:
        i. Global warming potential (greenhouse gases), in CO_2e;
        ii. Depletion of the stratospheric ozone layer, in kg CFC-11;
        iii. Acidification of land and water sources, in moles H+ or kg SO_2;
        iv. Eutrophication, in kg nitrogen or kg phosphate;
        v. Formation of tropospheric ozone, in kg NOx or kg ethene; and depletion of nonrenewable energy resources, in MJ.

3) For 1) and 2) above, if a product is also sourced (extracted, manufactured, purchased) within 100 miles of the site, it is valued as two times the whole product.

4) For 1) and 2) above, structure and enclosure materials may not constitute more than 30% of the value of compliant building products.

h. The number or percentage of products for which Sourcing of Raw Materials has been documented, with fractional or multiplied values as indicated below. If a product used in the Project has documented Sourcing of Raw Materials, submit one of the following:

1) Corporate sustainability report (CSR). Submit one of the following:
   i. Manufacturer's self-declared report: valued as half of a product
   ii. Third-party verified CSR which include environmental impacts of extraction operations and activities associated with the manufacturer's product and the product's supply chain: valued as one whole product:
      1. Global Reporting Initiative (GRI) Sustainability Report
      2. Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises
      3. U.N. Global Compact: Communication of Progress
      4. ISO 26000: 2010 Guidance on Social Responsibility
      5. Other USGBC approved programs meeting the CSR criteria

2) Documentation of at least one of the responsible extraction criteria below:
   i. Extended producer responsibility program, valued as half of a product
   ii. Bio-based materials, valued as one whole product
   iii. Certified Wood: Wood-based materials include all materials made from wood, including engineered wood products and wood-based panel products, valued as one whole product
   iv. Material Reuse: Materials may be salvaged, refurbished, or reused, valued as one whole product.
   v. Recycled content. The sum of post-consumer recycled content plus one-half the pre-consumer recycled content, based on cost, valued as one whole product.
   vi. Other USGBC approved programs meeting leadership extraction criteria

3) For 1) and 2) above, if a product is also sourced (extracted, manufactured, purchased) within 100 miles of the site: valued as two times the whole product.

4) For 1) and 2) above, structure and enclosure materials may not constitute more than 30% of the value of compliant building products. Products meeting multiple criteria may only be counted once.

i. The number or percentage of products for which Material Ingredients have been disclosed, with fractional or multiplied values as indicated below. If a product used in the Project discloses its Material Ingredients, submit one of the following:

1) Chemical inventory of the product to at least 0.1% (1000 ppm), documented by one of the following:
   i. Manufacturer Inventory
   ii. Health Product Declarations (HPDs)
   iii. Cradle to Cradle (C2C) certifications
   iv. Declare product labels
   v. ANSI/BIFMA e3 Furniture Sustainability Standard (Furniture may be included, providing it is included consistently in all MR Credits.)

2) Documentation of compliance with one of the following material ingredient optimization criteria programs:
   i. GreenScreen benchmarks
   ii. Cradle to Cradle certifications
   iii. REACH optimizations
   iv. Other USGBC approved programs meeting building product optimization criteria

3) Documentation that the product is sourced from a manufacturer that meets all of the below supply chain optimization criteria:
   i. Manufacturer engages in validated and robust safety, health, hazard and risk programs which at a minimum document at least 99% (by weight) of the ingredients used to make the building product or building material
   ii. Manufacturer provides independent third party verification of the following conditions for their supply chain, at a minimum:
      1. Processes are in place to communicate and transparently prioritize chemical ingredients along the supply chain according to available hazard, exposure and use information to identify those that require more detailed evaluation
      2. Processes are in place to identify, document, and communicate information on health, safety and environmental characteristics of chemical ingredients
      3. Processes are in place to implement measures to manage the health, safety and environmental hazard and risk of chemical ingredients
      4. Processes are in place to optimize health, safety and environmental impacts when designing and improving chemical ingredients
      5. Processes are in place to communicate, receive and evaluate chemical ingredient safety and stewardship information along the supply chain
      6. Safety and stewardship information about the chemical ingredients is publicly available from all points along the supply chain

4) For 2) and 3) above, if a product is also sourced (extracted, manufactured, purchased) within 100 miles of the site: valued as two times the whole product. Products compliant with both 2) and 3) may only be counted once.

5) For 1), 2), and 3) above, structure and enclosure materials may not constitute more than 30% of the value of compliant building products.

2. LEED v4 Indoor Environmental Quality Credit Low-Emitting Materials Calculator (EQ Calculator). With each relevant product submittal, the Contractor is responsible for the completion of the EQ Calculator, which can be found on USGBC's website. The Contractor must maintain an updated EQ Calculator throughout the Project duration for all applicable products and submit the updated calculator on a monthly basis.

   a. The EQ Calculator must record information for all relevant products as outlined below. Include the following documentation. Detailed requirements are listed in b. – j. below.
      1) Volume used of all field applied interior adhesives, sealants, paints & coatings.
      2) VOC content of all field-applied interior adhesives, sealants, paints, and coatings, listed in grams/liter or lbs./gallon, less water.
      3) General Emissions Evaluation for more than 90 percent of all field-applied interior paints, coatings, adhesives, and sealants, by volume, and for 100 percent of all flooring, ceilings, walls, and thermal and acoustic insulation.
      4) Composite Wood Evaluation for all composite wood not covered by other categories.
      5) Furniture Evaluation for 90% of all furniture, by cost.

6) For schools/healthcare only: Exterior-Applied Products Evaluation for 90% of all exterior applied materials, measured by volume. All batt insulation products must contain no added formaldehyde.

b. VOC REQUIREMENTS, GENERAL: The following materials must meet the listed compliance requirements for emissions and content standards, for all applicable categories. All products must comply with each applicable threshold requirement. Refer to LEED BD+C Reference Guide, EQ Credit Low-Emitting Materials for additional guidance.

1) General Emissions Requirements: Products must demonstrate they have been tested and determined compliant in accordance with California Department of Public Health (CDPH), Standard Method v1.1-2010 or v1.2-2017, using the applicable exposure scenario, and stating the range of total VOCs (TVOC) after 14 days measured as specified in the CDPH Standard Method v1.1 as follows:
   i. 0.5mg/m3 or less;
   ii. between 0.5 and 5.0 mg/m3; or,
   iii. 0.50 mg/m3 or more
2) No product may contain any ingredients that are carcinogens, mutagens, reproductive toxins, persistent bioacculmulative compounds, hazardous air pollutants, or ozone-depleting compounds. An exception will be made for titanium dioxide and, for products that are pre-tinted by the manufacturer, carbon black, which must be less than or equal to 1% by weight of the product.
3) No product may contain the following:
   i. methylene chloride
   ii. 1,1,1-trichloroethane
   iii. benzene
   iv. toluene
   v. ethylbenzene
   vi. vinyl chloride
   vii. naphthalene
   viii. 1,2-dichlorobenzene
   ix. di (2-ethylhexyl) phthalate
   x. butyl benzyl phthalate
   xi. di-n-butyl phthalate
   xii. di-n-octyl phthalate
   xiii. diethyl phthalate
   xiv. dimethyl phthalate
   xv. isophorone
   xvi. antimony
   xvii. cadmium
   xviii. hexavalent chromium
   xix. lead
   xx. mercury
   xxi. formaldehyde
   xxii. methyl ethyl ketone
   xxiii. methyl isobutyl ketone
   xxiv. acrolein
   xxv. acrylonitrile
4) No product may contain more than 1.0% by weight of sum total of volatile aromatic compounds.

c. VOC REQUIREMENTS FOR INTERIOR ADHESIVES AND SEALANTS:
1) For field applications that are inside the weatherproofing system, use adhesives and sealants that comply with the following limits for VOC content when calculated

according to South Coast Air Quality Management District (SCAQMD) Rule #1168 requirements in effect on July 1, 2005, and rule amendment date January 7, 2005:

	Allowable VOC Content (g/L):
Architectural Applications:	
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesives	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Dry wall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Specialty Applications:	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Computer diskette manufacturing	350
Contact adhesive	80
Special purpose contact adhesive	250
Tire retread	100
Adhesive primer for traffic marking tape	150
Structural wood member adhesive	140
Sheet applied rubber lining operations specialty	850
Top and Trim adhesive	250
Substrate Specific Applications:	
Metal to metal substrate specific adhesives	30
Plastic foam substrate specific adhesives	50
Porous material (except wood) substrate specific adhesives	50
Wood substrate specific adhesives	30
Fiberglass substrate specific adhesives	80
Sealants:	
Architectural sealant	250
Marine deck sealant	760
Nonmember roof sealant	300
Roadway sealant	250
Single-ply roof membrane sealant	450
Other sealant	420
Sealant Primers:	
Architectural non-porous sealant primer	250
Architectural porous sealant primer	775

Modified bituminous sealant primer	500
Marine deck sealant primer	760
Other sealant primer	750
Other	
Other adhesives, adhesive bonding primers, adhesive primers or any other primers	250

2) For field applications that are inside the weatherproofing system, a minimum of 90 percent of adhesives and sealants, by volume, must comply with the requirements of the CDPH "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

d. VOC REQUIREMENTS FOR INTERIOR PAINTS AND COATINGS:

1) For field applications that are inside the weatherproofing system, use paints and coatings that comply with the following limits for VOC content when calculated according to the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the SCAQMD Rule #1113, effective June 3, 2011.

Product Type:	Allowable VOC Content (g/L):
Bond Breaker	350
Clear wood finishes - Varnish	275
Clear wood finishes – Sanding Sealer	275
Clear wood finishes - Lacquer	275
Colorant – Architectural Coatings, excluding IM coatings	50
Colorant – Solvent Based IM	600
Colorant - Waterborne IM	50
Concrete – Curing compounds	100
Concrete – Curing compounds for roadways & bridges	350
Concrete surface retarder	50
Driveway Sealer	50
Dry-fog coatings	50
Faux finishing coatings - Clear topcoat	100
Faux finishing coatings – Decorative Coatings	350
Faux finishing coatings - Glazes	350
Faux finishing coatings - Japan	350
Faux finishing coatings – Trowel applied coatings	50
Fire-proof coatings	150
Flats	50
Floor coatings	50
Form release compounds	100
Graphic arts (sign) coatings	150
Industrial maintenance coatings	100
Industrial maintenance coatings – High temperature IM coatings	420
Industrial maintenance coatings – Non-sacrificial anti-graffiti coatings	100
Industrial maintenance coatings – Zinc rich IM primers	100

Magnesite cement coatings	450
Mastic coatings	100
Metallic pigmented coatings	150
Multi-color coatings	250
Non-flat coatings	50
Pre-treatment wash primers	420
Primers, sealers and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Roof coatings, aluminum	100
Roof primers, bituminous	350
Rust preventative coatings	100
Stone consolidant	450
Sacrificial anti-graffiti coatings	50
Shellac- Clear	730
Shellac – Pigmented	550
Specialty primers	100
Stains	100
Stains, interior	250
Swimming pool coatings – repair	340
Swimming pool coatings – other	340
Traffic Coatings	100
Waterproofing sealers	100
Waterproofing concrete/masonry sealers	100
Wood preservatives	350
Low solids coatings	120

2) For field applications that are inside the weatherproofing system, 90 percent of paints and coatings must comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

e. LOW-EMITTING MATERIALS, FLOORING: Flooring must comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
f. LOW-EMITTING MATERIALS, COMPOSITE WOOD: Composite wood, agrifiber products, and adhesives must be made using ultra-low-emitting formaldehyde (ULEF) resins as defined in the CARB's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or must be made with no added formaldehyde.
g. LOW-EMITTING MATERIALS, CEILINGS, WALLS, THERMAL, AND ACOUSTIC INSULATION: Ceilings, walls, and thermal and acoustic insulation must comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
h. LOW-EMITTING MATERIALS, FURNITURE: At least 90 percent of furniture, measured by cost, will be tested in accordance with ANSI/BIFMA Standard Method M7.1-2011; comply with ANSI/BIFMA e3-2011 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2, using either the concentration modeling approach or the emissions factor approach; and model the test results using the open plan, private office, or seating scenario in ANSI/BIFMA M7.1, as appropriate.
i. LOW-EMITTING MATERIALS, EXTERIOR APPLIED MATERIALS (HEALTHCARE/ SCHOOLS ONLY): At least 90 percent of exterior applied materials, measured by volume,

must comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

1) The following materials are prohibited and do not count toward total percentage compliance:
   a) Hot-mopped asphalt for roofing.
   b) Coal tar sealants for parking lots and other paved surfaces.

j. LOW-EMITTING MATERIALS, ADDITIONAL LOW-EMITTING REQUIREMENTS: If the applicable regulation requires subtraction of exempt compounds, any content of intentionally added exempt compounds larger than 1% weight by mass (total exempt compounds) must be disclosed.

1) If a product cannot reasonably be tested as specified above, testing of VOC content must comply with ASTM D2369-10; ISO 11890, part 1; ASTM D6886-03; or ISO 11890-2.

2) Methylene chloride and perchloroethylene may not be intentionally added in adhesives, sealants, paints or coatings.

3. BACK-UP DOCUMENTATION: For each material listed in the Disclosure and Optimization Calculator or the EQ Calculator, provide and submit in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, including but not limited to the documentation to certify the material's LEED Building attributes, as applicable:

a. INSTALLATION ON LOCATION: Submit indication of the installation location of products other than adhesives, sealants, paints and coatings. Installation locations should be categorized as one of the following:
   1) Ceiling
   2) Wall
   3) Floor
   4) Subfloor
   5) Built-In Cabinetry
   6) Free-Standing Cabinetry
   7) Vertical Structural Elements
   8) Overhead Structural Elements

b. RECYCLED CONTENT: Submit published product literature or letter of certification on the manufacturer's letterhead certifying the amounts of post-consumer and/or post-industrial content.

c. REGIONAL SOURCING (WITHIN 100 MILES): Submit published product literature or letter of certification on the manufacturer's letterhead indicating the city/state where the manufacturing plant is located, where each of the raw materials in the product were extracted, harvested or recovered, manufactured, distributed and the distance in miles from the Project site.
   1) If only some of the raw materials for a particular product or assembly originate within 100 miles of the Project site, provide the percentage (by weight) that these materials comprise in the complete product.

d. BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION: Submit published third-party or manufacturer's product literature or letter of certification, on the third-party or manufacturer's letterhead, certifying the documented disclosure and optimization information.

e. VOC EMISSIONS AND CONTENT: Submit Material Safety Data Sheets (MSDS), for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings, flooring, composite wood, ceilings, walls, thermal and acoustic insulation, furniture, and for healthcare and schools, exterior applied products. MSDS must

indicate the VOC emissions and content of products submitted. (If an MSDS does not include a product's VOC emissions and content, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer must be submitted in addition to the MSDS to indicate the VOC emissions and content). Submit product third-party certificates and test reports, stating the testing methodology and the model, to include units that are consistent with those required. For wet-applied products, the manufacturer's documentation must state each product's classification and application according to the referenced standard's definition.

4. PRODUCT CUT SHEETS: Submit product cut sheets with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project.

5. FSC-CERTIFIED WOOD: If FSC-Certified Wood is used in the Project, submit:
   a. Copies of vendor's invoices itemizing all new wood purchases, showing the cost for each line item.
   b. For FSC-certified products, the vendor invoice must list product's FSC content percent and its Chain-of-Custody (CoC) certification number.
   c. For FSC-certified products, submit the product and producer's CoC certificates.
   d. For FSC-certified products modified on-site, submit on-site installer's CoC certification.
   e. For assemblies, submit the percentage (by cost and by weight) of the assembly that is FSC-certified wood and published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the percentage that is FSC-certified wood.

6. HIGH ALBEDO PAVING AND WALKWAY MATERIALS: For paving and walkway materials made from concrete or brick, submit published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying a minimum 3-year aged Solar Reflectance (SR) value of 0.28. If 3-year aged value information is not available, submit published product literature or letter verifying an initial SR value of at least 0.33 at installation.

7. HIGH ALBEDO ROOFING MATERIALS: For exposed roofing membranes, pavers, and ballast products, submit published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the following minimum Solar Reflectance Index (SRI) values, calculated according to ASTM E 1980. Reflectance will be measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance will be measured according to ASTM E 408 or ASTM C 1371. Vegetated roof surfaces are exempt from the SRI criteria.

   a. 82 for initial SRI, or 64 for 3-year aged SRI for low-sloped roofing applications (slope ≤ 2:12)
   b. 39 for initial SRI or 32 for 3-year aged SRI for steep-sloped roofing applications (slope > 2:12)

8. LOW MERCURY LAMPS: For all fluorescent, compact fluorescent and HID lamps installed in the Project, submit the total number of each lamp type and submit published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the following information. Preheat, T-9, T-10 and T-12 fluorescents or mercury vapor high-intensity discharge (HID) lamps must not be installed in the Project. For healthcare projects only, probe-start metal halide HID lamps must not be installed in any interior spaces.

   a. The mercury content or content range per lamp in milligrams or picograms, meeting the following criteria;

Lamp	Maximum Mercury Content (milligram)
T-8 fluorescent, eight-foot	10 mg
T-8 fluorescent, four-foot	3.5 mg
T-8 fluorescent, U-bent	6 mg
T-5 fluorescent, linear	2.5 mg
T-5 fluorescent, circular	9 mg
Compact fluorescent, nonintegral ballast	3.5 mg
Compact fluorescent, integral ballast	3.5 mg, ENERGY STAR qualified

High-pressure sodium, up to 400 watts	10 mg
High-pressure sodium, above 400 watts	32 mg

b. The design light output per lamp (light at 40% of a lamp's useful life) in lumens; and
c. The rated average life of the lamp in hours.

9. EXIT SIGNS: Illuminated exit signs must not contain mercury, and must use less than 5 watts of electricity.

10. CONCRETE: Submit concrete mix design for each mix, designated by a distinct identifying code or number and signed by a Professional Engineer licensed in the state of New York.

11. INTERIOR LIGHTING FIXTURES: For each lighting fixture type installed within the building's weather barrier, submit manufacturer's cut sheets indicating the following:

    a. Fixture power in watts.
    b. Initial lamp lumens.
    c. Photometric distribution data.
    d. Dimming capability, in range of percentages.

12. EXTERIOR LIGHTING FIXTURES: For each lighting fixture type installed on site, submit manufacturer's cut sheets indicating the following:

    a. Fixture power in watts.
    b. Initial lamp lumens.
    c. Photometric distribution data.
    d. Range of field adjustability, if any.
    e. Warranty of suitability for exterior use.

13. ALTERNATIVE TRANSPORTATION: Submit manufacturer's cut sheets and/or shop drawings for the following items installed on site:

    a. Bike racks, including total number of bicycle slots provided.
    b. Signage indicating parking spaces reserved for electric or low-emitting vehicles and for carpools/vanpools, including total number of signs.

14. WATER CONSERVING FIXTURES: For all water consuming plumbing fixtures and fittings, submit manufacturer's cut sheets showing maximum flow rates and/or flush rates.

15. ENERGY SAVING APPLIANCES: Submit manufacturer's cut sheets and published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the product's rating under the U.S. EPA/DOE Energy Star program, for all of the following:

    a. Appliances (i.e., refrigerators, dishwashers, microwave ovens, televisions, clothes washers, clothes dryers, chilled water dispensers).
    b. Office equipment (i.e., copy machines, fax machines, plotters/printers, scanners, binding and publishing equipment).
    c. Electronics (i.e., servers, desktop computers, computer monitor displays, laptop computers, network equipment).
    d. Commercial food service equipment.

16. GLAZING: For glazing in any windows, doors, storefront and window wall systems, curtainwall systems, skylights, and partitions, submit manufacturer's cut sheets indicating the following:

    a. Glazed area.
    b. Visible light transmittance.
    c. Solar heat gain coefficient.
    d. Fenestration assembly u-factor.

17. VENTILATION: Submit manufacturer's cut sheets for the following:
    a. Carbon dioxide monitoring systems, if any, installed to measure outside air delivery.
    b. Air filters: for detailed requirements refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS.
18. REFRIGERATION: For all refrigeration equipment, submit manufacturer's cut sheets indicating the following:
    a. Equipment type.
    b. Equipment life. Default values specified by the 2007 ASHRAE Applications Handbook will be used unless otherwise demonstrated by the manufacturer's guarantee and an equivalent long-term service contract.
    c. Refrigerant type.
    d. Refrigerant charge in pounds of refrigerant per ton of gross cooling capacity.
    e. Tested refrigerant leakage rate, in percent per year. A default rate of 2% will be used unless otherwise demonstrated by test data.
    f. Tested end-of-life refrigerant loss, in percent. A default rate of 10% will be used unless otherwise demonstrated by test data.

1.7 LEED BUILDING SUBMITTAL REQUIREMENTS:

A. The LEED Building Submittal information must be assembled into one package per contract specification section(s) (or per Subcontractor), and submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. Incomplete or inaccurate LEED Building Submittals may be used as the basis for the rejection of products or assemblies.

B. All final LEED Building Submittal information with back-up documentation must be submitted within two (2) months of the Project's substantial completion. If in the Project's LEED review, the USGBC or their third party reviewer requires additional documentation as it relates to the LEED Building Submittals, the Contractor must provide the requested documentation within two (2) weeks.

1.8 LEED ACTION PLANS:

A. Construction Waste Management Plan- Refer to Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for detailed requirements.

B. Construction IAQ Management Plan- Refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS for detailed requirements.

C. Erosion and Sedimentation Control (ESC) Plan:
    1. The Plan must be in accordance with the New York State Department of Environmental Conservation (NYSDEC)'s New York State Standards and Specifications for Erosion and Sediment Control (Blue Book) or the 2012 EPA Construction General Permit, whichever is more stringent.
    2. The Plan must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.
    3. Detailed requirements: ESC Plan
        a. Include the Stormwater Pollution Prevention Plan, if required.
        b. Identify the party responsible for Plan monitoring and documentation. The party must be regularly on site.
        c. Describe all site work that will be implemented on the Project and include timing of implementation.

d. Submit site plan with location of ESC measures, including, but not limited to, stormwater quantity controls, stormwater quality controls, stabilized construction entrances, washdown areas, inlet/catch basin protection and perimeter controls.
e. Establish and clearly delineate construction buffer zones to avoid soil compaction and other construction damage to greenfields.
f. Describe the inspection and maintenance protocols of the ESC measures. Submit a construction schedule indicating weekly site review.
g. Describe reporting and documentation measures.

4. Detailed requirements: ESC Tracking Log
   a. Note date of major rain events, describe damage, describe any repairs or maintenance of specific control measures performed, and note responsible party.
   b. Note date and findings of weekly site review, describe any repairs or maintenance performed, and note responsible party. Submit date-stamped photographs, inspection reports or other recording processes.
   c. Submit monthly.
5. Implementation
   a. Before Demolition and/or Construction begins, the Contractor will implement the ESC Plan, coordinate the Plan with all affected trades, and designate one individual as the Erosion and Sedimentation Control Representative, who will be responsible for communicating the progress of the Plan with the Commissioner monthly, and for assembling the required LEED documentation.
   b. The Contractor is responsible for the provision, maintenance, and repair of all ESC measures. Any problems identified in site inspections must be resolved in a timely manner.
   c. Demonstration. The Contractor must provide on-site instruction of proper construction practices required to prevent erosion and sedimentation.
   d. All Subcontractors must promptly notify the ESC Representative if damage to an ESC measure is observed.
   e. Meetings. Urgent or ongoing ESC issues must be discussed at weekly on-site job meetings.
6. All projects, including zero lot line buildings and projects that cause minimal or even no exterior site disturbance, must have ESC Plan that meets requirements.
7. Contractor must save such original documents for the life of the Project plus seven (7) years.

1.9 QUALITY ASSURANCE:

A. The Contractor must implement all LEED Action Plans, coordinate the Plans and LEED Building Submittals with all affected trades, and designate one individual as the Sustainable Construction Representative at no additional cost to the City of New York, who will be responsible for communicating the progress of LEED activities with the Commissioner monthly, and for assembling the required LEED documentation. The Contractor must facilitate measurements taken by authorized parties on site for LEED compliance verification purposes.

B. Responsibilities of Contractor's Subcontractors: The Contractor is responsible for the Subcontractors complying with the LEED Action Plans and for providing required LEED documentation as required for the Project.

C. Distribution and Compilation: The Contractor is responsible for distributing the LEED v4 MR Credits Calculator for Building Product Disclosure and Optimization, the LEED v4 EQ Credit Low-Emitting Materials Calculator, and any other forms or templates required for the Subcontractors to record LEED documentation. The Contractor is also responsible for collecting and compiling Building Product Disclosure and Optimization and Low-Emitting Materials information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.

D. Meetings: Sustainable design and construction issues must be discussed at the following meetings in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION:
   1. Demolition kick-off meeting

2. Construction kick-off meeting
3. Construction kick-off meeting for LEED (independent meeting)
4. Weekly job-site progress and coordination meetings
5. Closeout meeting

1.10 REFERENCES:

A. New York State Standards and Specifications for Erosion and Sediment Control, amended November 2016: http://www.dec.ny.gov/docs/water_pdf/2016nysstanec.pdf

B. 2012 EPA Construction General Permit: https://www.epa.gov/npdes/epas-2012-construction-general-permit-cgp-and-related-documents

C. South Coast Air Quality Management District (SCAQMD), Rule 1168: www.aqmd.gov

D. South Coast Air Quality Management District (SCAQMD), Rule 1113: www.aqmd.gov

E. CDPH Standard Method v1.1-2010: www.cal-iaq.org

F. ISO 17025: www.iso.org

G. ISO Guide 65: www.iso.org

H. CARB 93120 ATCM: arb.ca.gov/toxics/compwood/compwood.htm

I. ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components and Seating: bifma.org

J. ANSI/BIFMA e3-2011 Furniture Sustainability Standard: bifma.org

K. ISO 14021–1999, Environmental labels and declarations—Self Declared Claims (Type II Environmental Labeling): www.iso.org

L. ISO 14025–2006, Environmental labels and declarations (Type III Environmental Labeling): www.iso.org

M. ISO 14040–2006, Environmental management, Life cycle assessment principles, and frameworks: www.iso.org

N. ISO 14044–2006, Environmental management, Life cycle assessment requirements, and guidelines: www.iso.org

O. International Standard ISO 21930–2007 Sustainability in building construction—Environmental declaration of building products: www.iso.org

P. Federal Trade Commission, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e): www.ftc.gov/bcp/grnrule/guides980427.htm

Q. Global Reporting Initiative (GRI) Sustainability Report: www.globalreporting.org/

R. Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises: www.oecd.org/daf/internationalinvestment/guidelinesformultinationalenterprises/

S. U.N. Global Compact, Communication on Progress: www.unglobalcompact.org/participation/report/cop

T. ISO 26000—2010 Guidance on Social Responsibility: www.iso.org/iso/home/standards/iso26000.htm

U. Forest Stewardship Council: www.ic.fsc.org

V. Sustainable Agriculture Network: www.sanstandards.org

W. The Rainforest Alliance: www.rainforest-alliance.org/

X. ASTM Test Method D6866: www.astm.org/Standards/D6866.htm

Y. Chemical Abstracts Service: www.cas.org/

Z. Health Product Declaration: www.hpd-collaborative.org/

AA. Cradle-to-Cradle CertifiedCM Product Standard: www.c2ccertified.org/product_certification

BB. Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): www.echa.europa.eu/support/guidance-on-reach-and-clp-implementation

CC. GreenScreen: www.greenscreenchemicals.org/method/greenscreen-list-translator

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.04

SECTION 01 81 13.10
ENVIRONMENTALLY PREFERABLE PURCHASING (EPP) COMPLIANCE

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.10

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for all equipment, material and product purchasing to comply with the requirements of New York City Environmentally Preferable Purchasing (EPP) "Minimum Standards for Construction Products", as established by the Mayor's Office of Contract Services (MOCS). Refer to their website for further guidance.

B. All sections in the Project Specifications with applicable equipment, materials and products will follow all requirements of this section. In the event of any conflict or inconsistency between this section and the Specifications, the more stringent requirements will prevail.

C. This Section includes:

1. Definitions
2. Administrative Requirements
3. Action Submittals
4. Informational Submittals
5. Products, Materials

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	Definition
Environmentally Preferable Purchasing (EPP) Minimum Standards for Construction Products	The standard that refers to a list of equipment, materials and products that may be specified in construction contracts covered by the EPP laws and provides the applicable minimum standards referenced in the laws. See EPP Minimum Standards for Constructions Products available on MOCS' website for a comprehensive list of all applicable definitions.

1.5 ADMINISTRATIVE REQUIREMENTS:

A. At no additional cost to the City of New York, designate an individual who will be responsible for the communication of progress of EPP activities with the Commissioner on a regular basis and for the quality of all EPP-related materials and preparation, coordination and assembly of the supporting documentation.

B. Scope and Applicability: Action submittals and informational submittals are required for all installed equipment, materials and products that require EPP compliance. Provide all required submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

C. Distribution and Compilation: The Contractor must coordinate with all affected trades and is responsible for its Subcontractors complying with the EPP requirements and for providing required EPP documentation as required for the project. The Contractor is responsible for distributing the forms or templates required for the Subcontractors to record EPP documentation. The Contractor is also responsible for collecting and compiling information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.

D. The Contractor must respond in a timely manner to questions and requests from the Commissioner, Design Consultant and MOCS regarding EPP requirements that are the responsibility of the Contractor. Document responses as informational submittals.

1.6 ACTION SUBMITTALS:

A. General Requirements:

1. EPP Documentation Submittals for applicable and compliant product data, as stated in the EPP Minimum Standards for Construction Products, is to be documented in the form of a Vendor Survey and supporting manufacturer's data sheets highlighting EPP compliance-related data. Include in the Vendor Survey the anticipated quantity of product purchased and cost per unit data. See attached sample Vendor Survey form.

2. Compliance with EPP requirements will be used as one criterion to evaluate product selection. Assemble EPP Documentation Submittal information into one package per contract specification section(s) (or per Subcontractor). Incomplete or inaccurate EPP Documentation submittals may be used as the basis for the rejection of products or assemblies.

3. Update the quantities and costs in the Vendor Survey once products are approved and purchased and document as information submittal.

1.7 INFORMATIONAL SUBMITTALS

A. For each registered contract, the Contractor must maintain a Master Vendor Survey, an updated tracking log of all equipment, materials and products purchased on a contract that are required to comply with EPP. Submit the Master Vendor Survey on a monthly basis and update the costs once products are purchased.

1. Upon request by MOCS, submit the Master Vendor Survey and supporting documents.

B. EPP Progress Reports: Concurrent with each Application for Payment, submit reports of purchasing activities for each of the EPP-applicable equipment, materials and products listed in Sub-section C below.

C. Project Materials Cost Data: For Vendor Survey and EPP Progress Reports, include breakout of costs for the following categories of items:

1. Appliances.
2. Architectural Coatings.
3. HVAC Equipment.
4. Lighting Products.
5. Miscellaneous Products – Construction.
6. Plumbing Fixtures.

PART II – PRODUCTS

2.1 MATERIALS:

A. Detailed Requirements. This sub-section defines the information and documents to be provided for each EPP-applicable equipment, material and product type, as identified in each specification section:

1. Appliances – Residential:

   All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following residential appliances shall comply with this requirement:

   a. Clothes Washers
   b. Dehumidifiers
   c. Dishwashers, Standard-Sized
   d. Freezers, Upright, Chest and Compact
   e. Refrigerators and Refrigerator-Freezers, Standard-Sized and Compact

   Microwave Ovens shall comply with the following requirements:

   a. Recommended Standby Levels: 2 watts or less
   b. Best Available Standby Level: 2 watts or less

2. Architectural Coatings:

   a. For the products listed below, the maximum content of Volatile Organic Compounds (VOCs) shall be determined according to the American Society for Testing and Materials test method D 5116 (Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products).

Architectural Coating	**Maximum Concentration of VOC in Grams per Liter**
Clear Wood Coating – Clear-Brushing lacquers	275
Clear Wood Coating – Sanding Sealers (Other than Lacquers)	275
Clear Wood Coating –Varnishes	275
Floor Coatings	100
Lacquers - Pigmented	275
Primers for Flat Paint	100
Primers for Non-Flat Paint	150
Rust Preventative/Anti-Corrosive Paint	250

b. Any product listed below that is compliant with Part 205 of Title Six of the New York Codes, Rules and Regulations meets the standard required under EPP Minimum Standards for Construction Products. The maximum content of VOCs for these products shall be determined according to the test method required under part 205.6 of such part.

Architectural Coating	**Maximum Concentration of VOC in Grams per Liter**
Clear Wood Coating – Conversion Varnishes	725
Clear Wood Coating – Lacquers (Including Lacquer Sanding Sealers)	550
Concrete Bond Breakers	350
Concrete Curing Compounds	350
Concrete Surface Retarders	780
Dry Fog Coatings	400
Faux Finishing Coatings	350
Fire-Resistive Coatings	350
Fire-Retardant Coatings	650
Fire-Retardant Coatings - Opaque	350
Flat Paint	100
Form Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420
Industrial Maintenance (IM) Coatings	340
Low Solids Coatings	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	300
Metallic Pigmented Coatings	500
Multi-Color Coatings	500
Nonflat High-Gloss Coatings	250
Nonflat Paint	150
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	200
Quick-Dry Enamels	250
Quick-Dry Primers, Sealers, and Undercoaters	200
Recycled Coatings	250
Roof Coatings	250
Roof Coatings (Bituminous)	300
Roof Primers (Bituminous)	350
Shellacs – Clear	730
Shellacs – Opaque	550
Specialty Primers, Sealers and Undercoaters	350
Stains	250
Swimming Pool Coatings and Swimming Pool Repair and Maintenance Coatings	340
Thermoplastic Rubber Coatings and Mastics	550
Waterproofing Concrete / Masonry Sealers	400
Waterproofing Sealers	250
Wood Preservatives	350

c. The products listed below shall be recovered material and comply with the Post-consumer Content and Total Recovered Materials Content requirements.

Architectural Coating	Post-consumer Content (%)	Total Recovered Materials Content (%)
Latex Paint – Consolidated	100	100
Latex Paint – Reprocessed White, Off-White and Pastel Colors	20	20
Latex Paint – Reprocessed Grey, Brown, Earthtones and Other Dark Colors	50-99	50-99

3. HVAC Equipment: Commercial and Residential

a. Commercial

All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Commercial HVAC Equipment shall comply with this requirement:

1. Air Conditioners, Air-Cooled
2. Air Conditioners, Gas/Electric Package Units
3. Heat Pumps, Air Source

Chillers shall comply with the following Part Load Optimized Chillers IPLV and Full Load Optimized Chillers IPLV requirements:

Type	Compressor Type and Capacity	Part Load Optimized Chillers IPLV (kW/ton) Required	Full Load Optimized Chillers IPLV (kW/ton) Required
Air-Cooled	Scroll (30 – 60 tons)	0.86 or less	1.23 or less 1.1
Air-Cooled	Reciprocating (30 – 150 tons)	0.90 or less	1.23 or less 1
Air-Cooled	Screw (70 – 200 tons)	0.98 or less	1.23 or less 0.94
Water-Cooled	Centrifugal (150 – 299 tons)	0.52 or less	0.59 or less
Water-Cooled	Centrifugal (300 – 2,000 tons)	0.45 or less	0.56 or less
Water-Cooled	Rotary Screw (>150 tons)	0.49 or less	0.64 or less

b. Residential

All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Residential HVAC Equipment shall comply with this requirement:

1. Air Conditioners, Central (<65,000 Btu/h)

2. Air Conditioners, Central, Gas/Electric Package Units (<65,000 Btu/h)
3. Air Source Heat Pumps (<65,000 Btu/h)
4. Boilers and Boiler/Hot Water Heaters (<300,000 Btu/h)
5. Ceiling Fans
6. Furnaces and Furnace/Hot Water Heaters (<340,000 Btu/h)
7. Ground Source Heat Pumps (Geothermal)
8. In-Line Ventilating Fan
9. Programmable Thermostats
10. Range Hood and Bathroom /Utility Room Ventilating Fans
11. Room Air Cleaners
12. Room Air Conditioners

4. Lighting Products

a. The following lighting products shall comply with the corresponding BEF requirement:

Product Type	**Number of Lamps**	**Required BEF**
Ballast, Fluorescent, Four-Foot, Linear T12, 34-Watts	1	2.64 or higher
Ballast, Fluorescent, Four-Foot, Linear T12, 34-Watts	2	1.41 or higher
Ballast, Fluorescent, Four-Foot, Linear T12, 34-Watts	3	0.93 or higher
Ballast, Fluorescent, Eight-Foot, Linear T12, 60-Watts	2	0.80 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	1	2.54 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	2	1.44 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	3	1.44 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	4	0.73 or higher
Ballast, Fluorescent, Eight-Foot, Linear T8, 59-Watts	2	0.80 or higher
Ballast, Fluorescent, Four-Foot, U-Bent T12, 34-Watts	1	2.64 or higher
Ballast, Fluorescent, Four-Foot, U-Bent T12, 34-Watts	2	1.41 or higher
Ballast, Fluorescent, Four-Foot, U-Bent T12, 34-Watts	3	0.93 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	1	2.54 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	2	1.44 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	3	0.93 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	4	0.73 or higher

b. All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Lighting Products shall comply with this requirement:

1. Exit Signs
2. Luminaires, Residential

c. Luminaires, Downlight, With Compact Fluorescent Lamps (13-32 Lamp Wattage) shall comply with the following LER requirements:

Luminaire Type (NEMA Designation)	Required LER
Open Optics	29 or higher
Baffled Optics	21 or higher
Lensed Optics	24 or higher

d. Luminaires, Downlight, With Metal Halide Lamps (<150 Watts) shall comply with the following LER requirements:

Luminaire Type (NEMA Designation)	Required LER
Open Optics	35 or higher
Lensed Optics	30 or higher

e. Luminaires, Fluorescent shall comply with the following LER requirements:

Luminaire Type (NEMA Designation)	Number of Lamps	Required LER
Lensed (FL)	2	62 or higher
Lensed (FL)	3	61 or higher
Lensed (FL)	4	61 or higher
VDT-Preferred Louvered (FP)	2	50 or higher
VDT-Preferred Louvered (FP)	3	51 or higher
VDT-Preferred Louvered (FP)	4	54 or higher
Four-Foot (FW)	2	63 or higher
Four-Foot (FW)	4	62 or higher
Four-Foot (FS)	1	70 or higher
Four-Foot (FS)	2	70 or higher
Four-Foot (FI)	1	67 or higher
Eight-Foot (FI)	2	68 or higher

f. Luminaires, Industrial HID, With High Pressure Sodium Lamps (<150 Lamp Wattage) shall comply with the following LER requirements:

Upward Efficiency	Lamp Wattage	Closed Fixture (HR) LER Required	Open Fixture (HR) LER Required
0%	150-399	58 or higher	68 or higher
0%	400-999	63 or higher	84 or higher
0%	>1000	N/A	N/A
1%-10%	150-399	64 or higher	63 or higher
1%-10%	400-999	82 or higher	89 or higher
1%-10%	>1000	N/A	109 or higher
11%-20%	150-399	N/A	78 or higher

11%-20%	400-999	N/A	94 or higher
11%-20%	>1000	N/A	N/A
>20%	150-399	75 or higher	77 or higher
>20%	400-999	N/A	N/A
>20%	>1000	N/A	N/A

5. Miscellaneous Products – Construction

   a. For the products listed below, the maximum content of Volatile Organic Compounds (VOCs) shall be determined according to the American Society for Testing and Materials test method D 5116 (Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products). The products may not contain any volatile organic compound in any concentration exceeding that specified below. Products that are compliant with the Green Label Plus program of the Carpet and Rug Institute are also compliant with this standard.

Carpet Adhesives		
Volatile Organic Compound	**24-Hour Testing Maximum Emission Factor (µg/m2•hr)**	**14-Day Testing Maximum Emission Factor (µg/m2•hr)**
Formaldehyde	50	31
2-ethyl-1-hexanol	300	300
Total Volatile Organic Compounds	800	N/A
Carpet Cushions		
Volatile Organic Compound	**24-Hour Testing Maximum Emission Factor (µg/m2•hr)**	**14-Day Testing Maximum Emission Factor (µg/m2•hr)**
Butylated Hydroxytoluene	300	N/A
Formaldehyde	50	N/A
4-Phenylcyclohexene (4PCH)	50	N/A
Total Volatile Organic Compounds	1000	N/A
Carpets		
Volatile Organic Compound	**24-Hour Testing Maximum Emission Factor (µg/m2•hr)**	**14-Day Testing Maximum Emission Factor (µg/m2•hr)**
Formaldehyde	50	30
4-Phenylcyclohexene	50	17
Styrene	410	410
Total Volatile Organic Compounds	500	N/A

b. The products listed below shall comply with the Recycled Post-consumer Content and Total Recovered Materials Content requirements.

Carpet Cushion – Bonded Polyurethane		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Old Carpet Cushion	15-50	15-50
Carpet Cushion – Jute		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Burlap	40	40
Carpet Cushion – Rubber		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Tire Rubber	60-90	60-90
Carpet Cushion – Synthetic Fibers		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Carpet Fabrication Scrape	No Range Recommended	100
Cement and Concrete		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Cenospheres	No Range Recommended	Minimum 10% (by volume)
Coal fly Ash	No Range Recommended	No Range Recommended
GGBF Slag	No Range Recommended	No Range Recommended
Silica Fume	No Range Recommended	5-10% of cementitious material (dry weight basis)
Channelizers		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic	25-90	No Range Recommended
Rubber (base only)	100	No Range Recommended
Delineators – Fixed		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic	25-90	No Range Recommended
Rubber (base only)	100	No Range Recommended
Steel (BOF, base only)	16	25-30
Steel (BOF, base only)	67	100
Delineators – Flexible		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic PET	25-85	No Range Recommended
Floor Tiles		
Material	Recovered Post-consumer Content (%)	Total Recovered Materials Content (%)
Rubber	90-100	No Range Recommended
Plastic	No Range Recommended	90-100
Insulation - Cellulose		

Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Post-consumer Paper	75	75
Insulation - Foam-In-Place		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Recovered Material	No Range Recommended	5
Insulation - Glass Fiber Reinforced		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Recovered Material	No Range Recommended	6
Insulation - Laminated Paperboard		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Post-consumer Paper	100	100
Insulation - Perlite Composition Board		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Post-consumer Paper	23	23
Insulation - Phenolic Rigid Foam	**Insulation - Phenolic Rigid Foam**	**Insulation - Phenolic Rigid Foam**
Material	**Material**	**Material**
Recovered Material	Recovered Material	Recovered Material
Insulation - Plastic, Non-woven Batt	**Insulation - Plastic, Non-woven Batt**	**Insulation - Plastic, Non-woven Batt**
Material	**Material**	**Material**
Recovered and/or Post-consumer Plastic	Recovered and/or Post-consumer Plastic	Recovered and/or Post-consumer Plastic
Insulation - Plastic Rigid Foam, Polyisocyanurate/Polyurethane: Rigid Foam	**Insulation - Plastic Rigid Foam, Polyisocyanurate/Polyurethane: Rigid Foam**	**Insulation - Plastic Rigid Foam, Polyisocyanurate/Polyurethane: Rigid Foam**
Material	**Material**	**Material**
Recovered Material	Recovered Material	Recovered Material
Insulation - Structural Fiberboard	**Insulation - Structural Fiberboard**	**Insulation - Structural Fiberboard**
Material	**Material**	**Material**
Recovered Material	Recovered Material	Recovered Material
Modular Threshold Ramps	**Modular Threshold Ramps**	**Modular Threshold Ramps**
Material	**Material**	**Material**
Steel (BOF)	Steel (BOF)	Steel (BOF)
Steel (EAF)	Steel (EAF)	Steel (EAF)
Aluminum	Aluminum	Aluminum
Rubber	Rubber	Rubber

Nonpressure Pipe		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Steel (BOF)	16	25-30
Steel (EAF)	67	100
Plastic (HDPE)	100	100
Plastic (PVC)	5-15	25-100
Cement	No Range Recommended	No Range Recommended
Playground Equipment		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic	90-100	100
Plastic Composite	50-75	95-100
Steel (BOF)	16	95
Steel (EAF)	50-100	95-100
Restroom Dividers/Partitions, Steel		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Steel (from BOF)	16	25-30
Steel (from EAF)	67	100
Roofing Materials		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Steel (BOF)	16	25-30
Steel (EAF)	67	100
Aluminum	20-95	20-95
Fiber (felt) or Fiber Composite	50-100	50-100
Rubber	12-100	100
Plastic or Plastic/Rubber Composite	100	100
Wood/Plastic Composite	No Range Recommended	100
Cement	No Range Recommended	No Range Recommended
Shower Dividers/Partitions, Steel		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Steel (from BOF)	16	25-30
Steel (from EAF)	67	100
Traffic Barricades		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic (High Density Polyethylene [HDPE], Low-Density Polyethylene [LDPE], Polyethylene terephthalate [PET])	80-100	100
Steel (BOF)	16	25-30
Steel (EAF)	67	100
Fiberglass	No Range Recommended	No Range Recommended

c. All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Construction Products shall comply with this requirement:

1. Entry or Patio Doors, Residential
2. Residential Skylights
3. Residential Windows & Tubular Daylighting Devices
4. Roof Products

d. Electric Motors shall comply with the following Nominal Efficiencies requirements:

Nominal Efficiencies for Induction Motors Rated 600 Volts or Less (Random Wound)						
Motor Size (HP)		**Open Drip-Proof (ODP)**		**Totally Enclosed Fan-Cooled (TEFC)**		
6-pole (1200 rpm)	**4-pole (1200 rpm)**	**2-pole (1200 rpm)**	**6-pole (1200 rpm)**	**4-pole (1200 rpm)**	**2-pole (1200 rpm)**	
1	82.5	85.5	77.0	82.5	85.5	77.0
1.5	86.5	86.5	84.0	87.5	86.5	84.0
2	87.5	86.5	85.5	88.5	86.5	85.5
3	88.5	89.5	85.5	89.5	89.5	86.5
5	89.5	89.5	86.5	89.5	89.5	88.5
7.5	90.2	91.0	88.5	91.0	91.7	89.5
10	91.7	91.7	89.5	91.0	91.7	90.2
15	91.7	93.0	90.2	91.7	92.4	91.0
20	92.4	93.0	91.0	91.7	93.0	91.0
25	93.0	93.6	91.7	93.0	93.6	91.7
30	93.6	94.1	91.7	93.0	93.6	91.7
40	94.1	94.1	92.4	94.1	94.1	92.4
50	94.1	94.5	93.0	94.1	94.5	93.0
60	94.5	95.0	93.6	94.5	95.0	93.6
75	94.5	95.0	93.6	94.5	95.4	93.6
100	95.0	95.4	93.6	95.0	95.4	94.1
125	95.0	95.4	94.1	95.0	95.4	95.0
150	95.4	95.8	94.1	95.8	95.8	95.0
200	95.4	95.8	95.0	95.8	96.2	95.4
250	95.4	95.8	95.0	95.8	96.2	95.8
300	95.4	95.8	95.4	95.8	96.2	95.8
350	95.4	95.8	95.4	95.8	96.2	95.8
400	95.8	95.8	95.8	95.8	96.2	95.8
450	96.2	96.2	95.8	95.8	96.2	95.8
500	96.2	96.2	95.8	95.8	96.2	95.8

Nominal Efficiencies for Induction Motors Rated Medium Voltage or Less (Form Wound)						
Motor Size (HP)		**Open Drip-Proof (ODP)**		**Totally Enclosed Fan-Cooled (TEFC)**		
6-pole (1200 rpm)	**4-pole (1200 rpm)**	**2-pole (1200 rpm)**	**6-pole (1200 rpm)**	**4-pole (1200 rpm)**	**2-pole (1200 rpm)**	
250-500	95.0	95.0	94.5	95.0	95.0	95.0

6. Plumbing Fixtures.

   a. The plumbing fixtures shall comply with the following Water Efficiency requirements:

Plumbing Fixture	**Water Efficiency Requirement**
Lavatory Faucets	< 2.0 gallons per minute
Showerheads, Residential and Commercial	< 2.2 gallons per minute
Toilets, Residential and Commercial	< 1.6 gallons per flush
Urinals, Residential and Commercial	< 1.0 gallons per flush

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.10

EPP VENDOR SURVEY FORM

Instructions: In the space provided, indicate the following: (1.) Choose Construction for the EPP Book Used (2.) Choose the product type from the drop-down menu; (3.) Choose the product detail from the drop-down menu; (4.) Identify the specific item under Product Description; (5.) Enter the number of products per unit; (6.) Enter the cost per unit; (7.) Enter the units purchased; (8.) Enter the total cost.

Return completed spreadsheet to the contracting agency in the accompanying letter. Thank you.

Agency Acronym	Environmental Preferable Purchasing Information				Quantity and Cost Information				
	EPP Book Used	Product Type	Product Details	Product Description	Products Per Unit	Cost Per Unit	Units Purchased	Total Cost	Comments
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
TOTAL					0.00	$0.00	0.00	$0.00	

SECTION 01 81 13.13
VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.13

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes requirements for volatile organic compound (VOC) content in adhesives, sealants, paints and coatings used for the project.

B. All sections in the Project Specifications with adhesives, sealant or sealant primer applications, paints and coatings will follow all requirements of this section. In the event of any conflict or inconsistency between this section and the Specifications regarding adhesives, sealant or sealant applications, paints and coatings, the requirements set forth in this Section will prevail.

C. This Section includes:

1. General Requirements
2. References
3. VOC Requirements for Interior Adhesives
4. VOC Requirements for Interior Sealants
5. VOC requirements for Interior Paints
6. VOC requirements for Interior Coatings
7. Submittals

1.3 RELATED SECTIONS: include without limitation the following:

A.	Section 01 10 00	SUMMARY
B.	Section 01 31 00	PROJECT MANAGEMENT AND COORDINATION
C.	Section 01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
D.	Section 01 33 00	SUBMITTAL PROCEDURES
E.	Section 01 73 00	EXECUTION
F.	Section 01 77 00	CLOSEOUT PROCEDURES
G.	Section 01 78 39	CONTRACT RECORD DOCUMENTS
H.	Section 01 81 13.03	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS
I.	Section 01 81 13.04	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS
J.	Section 01 81 19	INDOOR AIR QUALITY FOR LEED BUILDINGS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

ADHESIVE	Any substance used to bond one surface to another by attachment. Includes adhesive primers and adhesive bonding primers. A. Aerosol Adhesive: Any adhesive packaged as an aerosol with a spray mechanism permanently housed in a non-refillable can designed for hand-held application without the need for ancillary equipment.
CARCINOGEN	A chemical listed as a known, probable, reasonably anticipated, or possible human carcinogen by the International Agency for Research on Cancer (IARC) (Groups 1, 2A, and 2B), the National Toxicology Program (NTP) (Groups 1 and 2), the U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS) (weight-of-evidence classifications A, B1, B2, and C, carcinogenic, likely to be carcinogenic, and suggestive evidence of carcinogenicity or carcinogen potential), or the Occupational Safety and Health Administration (OSHA).
CLEAR WOOD FINISH	Clear/semi-transparent coating applied to wood substrates to provide a transparent or translucent solid film. 1. Lacquer: Clear/semi-transparent coating formulated with cellulosic or synthetic resins to dry by evaporation without chemical reaction and provide a solid, protective film. 2. Sanding Sealer: A sanding sealer that also meets the definition of a lacquer. 3. Varnish: Clear/semi-transparent coating, excluding lacquers and shellacs, formulated to dry by chemical reaction on exposure to air. May contain small amounts of pigment.
COATING	Liquid, liquefiable, or mastic composition that is converted to a solid adherent film after application to a substrate as a thin layer; and is used for decorating, protecting, identifying or to serve some functional purpose such as the filling or concealing of surface irregularities or the modification of light and heat radiation characteristics; and is intended for on-site application to interior or exterior surfaces of buildings. Does not include stains, clear finishes, recycled latex paint, specialty (industrial, marine or automotive) coatings or paint sold in aerosol cans.
FLOOR COATING	Opaque coating applied to flooring. Excludes industrial maintenance coatings.
HAZARDOUS AIR POLLUTANT	Any compound listed by the U.S. EPA in the Clean Air Act, Section 112(b)(1) as a hazardous air pollutant.

MUTAGEN	A chemical that meets the criteria for category 1, chemicals known to induce heritable mutations or to be regarding as if they induce heritable mutations in the germ cells of humans, under the Harmonized System for the Classification of Chemicals Which Cause Mutations in Germ Cells (United Nations Economic Commission for Europe, Globally Harmonized System of Classification and Labeling of Chemicals).
OZONE-DEPLETING COMPOUNDS	A compound with an ozone-depletion potential greater than 0.1 (CFC 11=1) according to the U.S. EPA list of Class I and Class II Ozone-Depleting Substances.
PAINT	A pigmented coating. For the purposes of this specification, paint primers are considered to be paints. 1. Flat Coating or Paint: Has a gloss of less than 15 (using an 85-degree meter) or less than 5 (using a 60-degree meter). 2. Non-Flat Coating or Paint: Has a gloss of greater than or equal to 15 (using an 85-degree meter) or greater than or equal to 5 (using a 60-degree meter). 3. Non-Flat High-Gloss Coating or Paint: Has a gloss of greater than or equal to 70 (using a 60-degree meter). 4. Anti-Corrosive / Rust Preventative Paint: Coating formulated and recommended for use in preventing the corrosion of ferrous metal substrates.
PRIMER	Coating that is formulated and recommended for one or more of the following purposes: to provide a firm bond between the substrate and a subsequent coating; to prevent a subsequent coating from being absorbed into the substrate; to prevent harm to a subsequent coating from materials in the substrate; or to provide a smooth surface for application of a subsequent coating.
REPRODUCTIVE TOXIN	A chemical listed as a reproductive toxin (including developmental, female, and male toxins) by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Code of Regulations, Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, et. Seq.).
SANDING SEALER	Clear/semi-transparent coating formulated to seal bare wood. Can be abraded to create a smooth surface for subsequent coatings. Does not include sanding sealers that are lacquers (see Clear Wood Finish above).
SEALANT	Any material with adhesive properties, formulated primarily to fill, seal, or waterproof gaps or joints between surfaces. Includes sealant primers and caulks.

SHELLAC	Clear or pigmented coating formulated solely with the resinous secretions of the lac beetle, thinned with alcohol and formulated to dry by evaporation without chemical reaction. Excludes floor applications.
STAIN	Clear semi-transparent/opaque coating formulated to change the color but not conceal the grain pattern or texture of the substrate.
VOLATILE AROMATIC COMPOUND	Any hydrocarbon compound containing one or more 6-carbone benzene rings, and having an initial boiling point less than or equal to 280 degrees Celsius measured at standard conditions of temperature and pressure.
VOLATILE ORGANIC COMPOUND	Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs.
WATERPROOFING SEALER	A coating that prevents the penetration of water into porous substrates.

1.5 GENERAL REQUIREMENTS:

A. The City of New York is committed to implementing good environmental practices and procedures which include achieving a LEED Green building rating. Specific project requirements related to this goal which may impact this area of work are listed in the applicable paragraphs of this specification section. The Contractor must ensure that the requirements as defined in the sections below and in related sections of the Contract Documents, are implemented to the fullest extent. Substitutions, or other changes to the work proposed by the Contractor or its Subcontractors, must not be allowed if such changes compromise the stated environmental goals.

1.6 REFERENCES:

A. Rule 1168 – “Adhesive and Sealant Applications”, amended 7 January 2005): South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

B. Rule 1113 - “Architectural Coatings”, amended 9 July 2004: South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

C. Green Seal Standard GS-11- “Paints”, of Green Seal, Inc., Washington, DC, www.greenseal.org

D. Green Seal Standard GC-03- “Anti-Corrosive Paints”, of Green Seal, Inc., Washington, DC, www.greenseal.org

1.7 VOC REQUIREMENTS FOR INTERIOR ADHESIVES, SEALANTS, PAINTS AND COATINGS:

A. GENERAL: Unless otherwise specified herein, the VOC content of all interior adhesives, sealants, paints and coatings (herein referred to as “products”) must not be in excess of **250 grams per liter.**

B. No product may contain any ingredients that are carcinogens, mutagens, reproductive toxins, persistent bioacculmulative compounds, hazardous air pollutants, or ozone-depleting compounds. An exception must be made for titanium dioxide and, for products that are pre-tinted by the manufacturer, carbon black, which must be less than or equal to 1% by weight of the product.

C. No product will contain the following:
1. methylene chloride
2. 1,1,1-trichloroethane
3. benzene
4. toluene
5. ethylbenzene
6. vinyl chloride
7. naphthalene
8. 1,2-dichlorobenzene
9. di (2-ethylhexyl) phthalate
10. butyl benzyl phthalate
11. di-n-butyl phthalate
12. di-n-octyl phthalate
13. diethyl phthalate
14. dimethyl phthalate
15. isophorone
16. antimony
17. cadmium
18. hexavalent chromium
19. lead
20. mercury
21. formaldehyde
22. methyl ethyl ketone
23. methyl isobutyl ketone
24. acrolein
25. acrylonitrile

D. No product will contain more than 1.0% by weight of sum total of volatile aromatic compounds.

1.8 VOC REQUIREMENTS FOR INTERIOR ADHESIVES:

A. The volatile organic compound (VOC) content of adhesives, adhesive bonding primers, or adhesive primers used in this project must not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications" of the South Coast Air Quality Management District (SCAQMD), of the State of California.

B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

C. For specified building construction related applications, the allowable VOC content is as follows:

1. Architectural Applications**:**

a.	Indoor carpet adhesive	50
b.	Carpet pad adhesive	50
c.	Wood flooring adhesive	100
d.	Rubber floor adhesive	60
e.	Subfloor adhesive	50
f.	Ceramic tile adhesive	65
g.	VCT and asphalt tile adhesive	50
h.	Drywall and panel adhesive	50
i.	Cove base adhesive	50
j.	Multipurpose construction adhesive	70
k.	Structural glazing adhesive	100

2. Specialty Applications:

a.	PVC welding	510

b.	CPVC welding	490
c.	ABS welding	325
d.	Plastic cement welding	250
e.	Adhesive primer for plastic	550
f.	Contact Adhesive	80
g.	Special Purpose Contact Adhesive	250
h.	Structural Wood Member Adhesive	140
i.	Sheet Applied Rubber Lining Operations	850
j.	Top and Trim Adhesive	250

3. Substrate Specific Applications:

a.	Metal to metal	30
b.	Plastic foams	50
c.	Porous material (except wood)	50
d.	Wood	30
e.	Fiberglass	80

4. Aerosol Adhesives:

a.	General purpose mist spray	65% VOC's by weight
b.	General purpose web spray	55% VOC's by weight
c.	Special purpose aerosol adhesives (all types)	70% VOC's by weight

1.9 VOC REQUIREMENTS FOR INTERIOR SEALANTS:

A. The volatile organic compound (VOC) content of sealants, or sealant primers used in this project must not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications" of the South Coast Air Quality Management District (SCAQMD), of the State of California.

B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

1. Sealants:

a.	Architectural	250
b.	Non-membrane roof	300
c.	Roadway	250
d.	Single-ply roof membrane	450
e.	Other	420

2. Sealant Primer:

a.	Architectural – Nonporous	250
b.	Architectural – Porous	775
c.	Other	750

1.10 VOC REQUIREMENTS FOR INTERIOR PAINTS:

A. Paints and Primers: Paints and primers used in non-specialized interior applications (i.e., for wallboard, plaster, wood, metal doors and frames, etc.) must meet the VOC limitations of the Green Seal Paint Standard GS-11, of Green Seal, Inc., Washington, DC. Product-specific environmental requirements are as follows:

1. Volatile Organic Compounds:
   a. The VOC concentrations (in grams per liter) of the product must not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24.

   <u>Interior Paints and Primers</u>:
   Non-flat: 150 g/l

Flat: 50 g/l
The calculation of VOC must exclude water and tinting color added at the point of sale.

B. Anti-Corrosive and Anti-Rust Paints: Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates must meet the VOC limitations of the Green Seal Paint Standard GC-03, of Green Seal, Inc., Washington, DC. Product-specific environmental requirements are as follows:
1. Volatile Organic Compounds:

a. The VOC concentrations (in grams per liter) of the product must not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24.
Anti-Corrosive and Anti-Rust Paints: 250 g/l

The calculation of VOC must exclude water and tinting color added at the point of sale.

1.11 VOC REQUIREMENTS FOR INTERIOR COATINGS:

A. Clear wood finishes, floor coatings, stains, sealers, and shellacs applied to the interior must meet the VOC limitations defined in Rule 1113, "Architectural Coatings" of SCAQMD, of the State of California. The VOC limits defined by SCAQMD, based on 7/9/04 amendments, are as follows. VOC limits are defined in grams per liter, less water and less exempt compounds.

1.	Clear Wood Finishes:	
	a. Varnish	350
	b. Sanding Sealers	350
	c. Lacquer	550
2.	Shellac:	
	a. Clear	730
	b. Pigmented	550
3.	Stains	250
4.	Floor Coatings	100
5.	Waterproofing Sealers	250
6.	Sanding Sealers	275
7.	Other Sealers	200

The calculation of VOC must exclude water and tinting color added at the point of sale.

1.12 SUBMITTALS:

A. Submit Material Safety Data Sheets, for all applicable products in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings. Material Safety Data Sheets must indicate the Volatile Organic Compound (VOC) limits of products submitted. (If an MSDS does not include a product's VOC limits, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer can be submitted in addition to the MSDS to indicate the VOC limits).

B. Submit Environmental Building Materials Certification Form (EBMCF) as referenced in Section 01 81 13.03 SUSTAINABLE REQUIREMENTS FOR LEED v3 BUILDINGS: For each field-applied adhesive, sealant, paint, and coating product, provide the VOC requirement, as provided in this Specification, for the relevant material category indicated on the documentation noted above.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.13

SECTION 01 81 19
INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 19

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 CONSTRUCTION IAQ MANAGEMENT GOALS FOR THE PROJECT:

A. The City of New York has determined that this Project must minimize the detrimental impacts on Indoor Air Quality (IAQ) resulting from construction Subcontractor activities. Factors that contaminate indoor air, such as dust entering HVAC systems and ductwork, improper storage of materials on-site, and poor housekeeping, must be minimized.

1.3 RELATED SECTIONS:

A. All sections of the Specifications related to interior construction, MEP systems and items affecting indoor air quality.

B. Division 9 (of the Specifications): Finishes.

C. Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's LEED Rating System, as specified in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

D. Refer to the Addendum to identify whether this project is designed to comply with Section 01 81 13.13 VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS.

E. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS.

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

Volatile Organic Compounds (VOCs)	Chemical compounds common in and emitted by many building products, including solvents in paints, coatings, adhesives and sealants, wood preservatives, composite wood binder, and foam insulations. Not all VOCs are harmful, but many of those contained within building products contribute to the formation of smog and may irritate building occupants by their smell or health impact.
Materials that act as “sinks” for VOC contamination	Absorptive materials, typically dry and soft materials (such as textiles, carpeting, acoustical ceiling tiles and gypsum board) that readily absorb VOCs emitted by “source” materials and release them over a prolonged period of time.
Materials that act as “sources” for VOC contamination	Products with high VOC contents that emit VOCs either rapidly during application and curing (typically "wet" products, such as paints, sealants, adhesives, caulks and sealers) or over a prolonged period (typically “dry” products such as flooring coverings with plasticizers and engineered wood with formaldehyde).

1.5 REFERENCES, RESOURCES:

A. “IAQ Guidelines for Occupied Buildings Under Construction”, Second Edition, 2007, The Sheet Metal and Air Conditioner Contractors National Association (SMACNA). (703) 803-2980, www.smacna.org.

B. ANSI/ASHRAE 52.2-2007, “Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size”, www.ashrae.org.

1.6 LEED BUILDING GENERAL REQUIREMENTS:

A. Implement practices and procedures as necessary to meet the Project’s environmental performance goals as set forth in the specific requirements of this section. Specific Project goals that may impact this area of work include: use of recycled-content materials; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. Ensure that the requirements related to these goals, as defined in this section, are implemented to the fullest extent. Substitutions or other changes to the work will not be allowed if such changes compromise the stated LEED building performance criteria.

1.7 CONSTRUCTION IAQ MANAGEMENT PLAN:

A. The Contractor must prepare a Construction IAQ Management Plan in coordination with each Subcontractor and submit the Construction IAQ Management Plan to the Commissioner for approval in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. The Construction IAQ Management Plan must meet the following criteria:

1. Construction activities must be planned to meet or exceed the minimum requirements of SMACNA’s “IAQ Guidelines for Occupied Buildings under Construction”, Second Edition, 2007.

2. Absorptive materials must be protected from moisture damage when stored on-site and after installation.

3. The planned operation of air handlers during construction must be described. If air handlers are to be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grille and return or transfer duct inlet opening, such that there is no bypass around the filtration media, as determined by ASHRAE 52.2-2007.

4. Filtration media must be replaced immediately prior to occupancy. Filtration media must have a MERV of 13 as determined by ASHRAE 52.2-2007.

5. A sequence of finish installation plan “Plan” must be developed, highlighting measures to reduce the absorption of VOCs by materials that act as “sinks”.

6. The use of tobacco products is prohibited inside the building and within 25 feet of the building entrance during construction.

7. A flush-out or air testing must be performed.

8. Upon approval of the finish installation plan by the Commissioner, it must be implemented by the Contractor through the duration of the construction process, and documented in accordance with the Submittal Requirements of Sub-Section 1.8 herein.

B. Detailed requirements of the Construction IAQ Management Plan are as follows:

1. SMACNA Guidelines: Chapter 3 of the referenced “IAQ Guidelines for Occupied Buildings Under Construction”, outline IAQ measures in five categories as listed below. The Construction IAQ Management Plan must be organized in accordance with the SMACNA format, and must address measures to be implemented in each of the five categories (including subsections). All subsections must be listed in the Plan; items that are not applicable for this Project should be listed as such.

a. HVAC Protection

1) Protect air handling, distribution equipment and air supply, and return ducting during construction.

2) All ductwork arriving on site will be sealed with plastic sheeting and stored on pallets or dunnage until installed.

3) Cover and protect all exposed air inlets and outlets, openings, grilles, ducts, plenums, etc. to prevent water, moisture, dust and other contaminant intrusion.

4) Apply protection immediately after ducting.

5) Protect ducting runs at the end of day’s work.

6) Inspect temporary filtration weekly and replace as required to maintain the proper ventilation rates in the building.

7) To reduce debris and contamination to mechanical systems, do not store materials in mechanical rooms.

b. Source Control

1) Protect stored on-site or installed absorptive or porous materials. Store materials in dry conditions indoors, under cover, and off the ground or floor.

2) Do not use wet or damaged porous materials in the building. Materials which become contaminated through direct exposure to moisture from precipitation, plumbing leaks, or condensation must be replaced by the Contractor, at no additional cost to the City of New York.

3) Use low-toxicity and low-VOC materials to the greatest extent possible.

4) Recover, isolate, and ventilate containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications.

5) Prevent exhaust fumes from idling vehicles, equipment and fossil-fueled tools from entering the building.

6) Containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications, must be closed when not in use.

7) Enforce the no-smoking job site policy.

c. Pathway Interruption

1) Depressurize work areas which contain dust and odors.

2) Pressurize occupied spaces to prevent intrusion of dust and odors.

3) Erect barriers to contain construction areas.

4) Relocate pollutant sources.

5) Temporarily seal the building and provide 100% outside air for ventilation.

6) Provide walk-off mats at entryways to reduce introduced dirt and pollutants.

7) Use dust guards and collectors on saws and other tools.

d. Housekeeping

1) Store materials on elevated platforms under cover, in a designated dry, clean location, prior to unpacking for installation.

2) If materials are not stored in an enclosed location, cover tops and sides of material with waterproof sheeting, securely tied.

3) Institute cleaning activities to remove contaminants from the building prior to occupancy. Clean all coils, air filters and ductwork prior to performing testing, adjusting and balancing of HVAC systems.

4) Sweep the work area on a daily basis. Use an efficient and effective dust collecting method such as damp cloth, wet mop, or vacuum with high-efficiency particulate filters. Activities which produce high levels of dust must be cleaned up immediately upon completion.

5) Spills or excess applications of products containing solvents, or with VOC levels above the limits for interior adhesives, sealants, paints and coatings described in these Specifications, must be removed immediately.

6) Dust all walls prior to application of finishes.

7) Vacuum all stud tracks prior to application of insulation.

8) Keep materials organized to improve job safety as well as indoor air quality.

e. Scheduling

1) Phase construction such that absorptive materials are installed only in areas that are weathertight.

2) Schedule activities that utilize “sources” of VOC contamination to take place prior to installing high absorbent materials that will act as “sinks” for contaminants.

3) Review of the appropriate components of the Construction IAQ Management Plan must be a regular action topic at weekly site coordination meetings. Implementation of the Plan must be documented in the meeting minutes.

2. Protection of Materials from Moisture Damage: As part of the “Source Control” section of the Construction IAQ Management Plan, measures to prevent installed materials or material stored on-site from moisture damage must be described. This section must also describe corrective measures to be taken if moisture damage does occur to absorptive materials during the course of construction (see Section 1.7 B.1.b).

3. Replacement of Filtration Media: Under the “HVAC Protection” section of the Construction IAQ Management Plan, a description of the filtration media in all ventilation equipment must be provided.

The description must include replacement criteria for filtration media during construction, and confirmation of filtration media replacement for all equipment immediately prior to occupancy.

4. Sequence of Finish Installation for Materials: Where feasible, absorptive materials must be installed after the installation of materials or finishes which have high short-term emissions of VOCs, formaldehyde, particulates, or other air-borne compounds. Absorptive materials include, but are not limited to: carpets; acoustical ceiling panels; fabric wall coverings; insulations (exposed to the airstream); upholstered furnishings; and other woven, fibrous or porous materials. Materials with high short-term emissions include, but are not limited to: adhesives, sealants and glazing compounds (specifically those with petrochemical vehicles or carriers); paints, wood preservatives and finishes; control and/or expansion joint fillers; hard finishes requiring adhesive installation; gypsum board (with associated finish processes and products); and composite or engineered wood products with formaldehyde binders.

5. Pre-Occupancy Phase: Perform either a flush-out or air sample testing (Options 1 or 2, respectively), as follows:

   a. 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:

i. All measurements must be conducted prior to occupancy, but during normal occupied hours and with the building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.

ii. The building must have all interior finishes installed, including but not limited to millwork, doors, paint, carpet and acoustic tiles. Non-fixed furnishings such as workstations and partitions are required to be in place for the testing.

iii. Prior to air sample testing, all punch-list items that would generate VOCs or other contaminants, the testing and balancing of the HVAC system and finalization of all cleaning must be completed. Use low-emitting cleaning products and vacuum cleaners with HEPA filtration.

iv. The number of sampling locations will vary depending upon the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points must not be less than one per 25,000 sq.ft., or for each contiguous floor area, whichever is larger, and include areas with the least ventilation and greatest presumed source strength.

v. Air samples must be collected between 3 feet and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum 4-hour period.

vi. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from the same locations as in the first test.

6. Implementation and Coordination: Before Demolition and/or Construction begins, the Contractor must implement the Construction IAQ Management Plan, coordinate the Construction IAQ Management Plan with all affected trades, and designate one individual as the Construction IAQ Representative at no additional cost to the City of New York, who will be responsible for communicating the progress of the Construction IAQ Management Plan with the Commissioner monthly and for assembling the required LEED documentation. Include provisions in the Construction

IAQ Management Plan for addressing conditions in the field that do not adhere to the Plan, including provisions to implement a stop work order or to rectify non-compliant conditions.

a. Distribution: The Contractor must distribute copies of the Construction IAQ Management Plan in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

b. Instruction: The Contractor must provide on-site instruction of appropriate site management to all Contractor's Subcontractors.

c. Monitoring: The Construction IAQ Representative must monitor the implementation of the Construction IAQ Management Plan.

1.8 SUBMITTALS:

A. Submit the following LEED-required records and documents in accordance with Section 01 33 00 SUBMITTAL PROCEDURES and, as applicable, Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

B. A copy of the Construction IAQ Management Plan as defined in Sub-Section 1.7 herein.

C. IAQ Tracking Log
   1. Note date of observed major Construction IAQ issues, describe any damage, describe any repairs or maintenance of specific control measures performed and note responsible party.
   2. Note date and findings of weekly site review, describe any repairs or maintenance performed, and note responsible party. Provide date-stamped photographs, inspection reports or other recording processes.
   3. Submit log monthly.

D. Product cut-sheets for all filtration media used during construction and installed immediately prior to occupancy, with MERV values highlighted. Cut sheets must be submitted with the Contactor's or Subcontractor's "approved" stamp as confirmation that the products are the products installed on the Project.

E. PHOTOGRAPHS: Submit to the Commissioner a minimum of 18 photographs as required under the provision for special photographs, in accordance with Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION, comprised of at least six photographs taken on three different occasions during construction of each IAQ measure. The photographs must document the implementation of the Construction IAQ Management Plan throughout the course of the Project construction. Examples include photographs of ductwork sealing and protection, temporary ventilation measures, and conditions of on-site materials storage (to prevent moisture damage). Photographs must include integral date stamping, and must be submitted with brief descriptions of the Construction IAQ Management Plan measure documented, or be referenced to Project meeting minutes or similar Project documents which reference to the Construction IAQ Management Plan measure documented.

F. A copy of the Project's "Testing, Adjusting and Balancing" (TAB) report, if applicable.

1.9 QUALITY ASSURANCE:

A. The Contractor will be responsible for preparing and implementing the Construction IAQ Management Plan and must coordinate and incorporate the work of its Subcontractors in the IAQ Management Plan. Include the Construction IAQ Management Plan requirements in contract agreements with Subcontractors. Familiarize Subcontractors with the Construction IAQ Management Plan and how the Construction IAQ Management Plan will affect their daily activities. Hold a Subcontractors' orientation meeting to review the Construction IAQ Management Plan requirements.

B. Responsibility of Subcontractors: Subcontractors for this Project will be responsible for cooperating with the Contractor in the preparation and implementation of the Construction IAQ Management Plan.

C. Include construction IAQ progress check-ins as a regular item in weekly Subcontractor meetings and safety meetings. Provide a copy of the plan on site, posted in an easily accessible area.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 19

SECTION 01 81 21

SUSTAINABLE CONSTRUCTION REQUIREMENTS

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes general requirements for sustainable construction.

1.3 DEFINITIONS

A. Embodied carbon: The greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials.

B. Environmental Product Declaration (EPD): A third-party-verified International Organization for Standardization (ISO) Series 14025 Type III declaration that quantifies environmental information on the life cycle of a product to enable comparisons between products fulfilling the same function.

1.4 SUBMITTALS

A. EPDs: The Contractor must submit to the Commissioner copies of all EPD's submitted to the Building Transparency database per Subsection 1.5.C.

B. Low emission vehicles and equipment: The Contractor must submit to the Commissioner a log of all internal combustion engine (ICE) powered equipment used on the Project. The log must be submitted at Substantial Completion, and include:

a. The type of equipment (generator, excavator, crane, light tower, air compressor, etc.),
b. The fuel used by the ICE,
c. The engine size in horsepower (HP), and
d. If the equipment was provided by a Subcontractor, which one.

1.5 ENVIRONMENTAL PRODUCT DECLARATIONS

A. EPDs are required for the following materials, if used:

1. Steel materials:

a. 05 12 00 STRUCTURAL STEEL FRAMING

b. 05 12 13 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL FRAMING

c. 05 21 00 STEEL JOIST FRAMING

d. 05 31 00 STEEL DECKING

e. 05 40 00 COLD-FORMED METAL FRAMING

f. 05 44 00 COLD FORMED METAL TRUSSES

2. Concrete materials:

a. 03 30 00 CAST-IN-PLACE CONCRETE

b. 03 38 16 UNBONDED POST-TENSIONED CONCRETE

c. 03 41 00 PRECAST STRUCTURAL CONCRETE

d. 03 45 00 PRECAST ARCHITECTURAL CONCRETE

e. 03 47 13 TILT-UP CONCRETE

B. If EPDs are available for materials not listed in subsection 1.5.A, they must be submitted.

C. EPDs must be submitted to the Building Transparency database, using the OpenEPD format, at https://buildingtransparency.org/ec3

1.6 LOW-EMISSION VEHICLES AND EQUIPMENT

A. The Contractor must endeavor to minimize the greenhouse gas emissions from the Contractor's equipment. To achieve this goal, the following is required:

1. Electric powered equipment is to be used where practical instead of internal combustion engine (ICE) powered equipment. The Contractor may refer to the NYC Department of Citywide Administrative Services (NYC DCAS) bi-annual publication, the Clean Fleet Transition Plan (https://www1.nyc.gov/site/dcas/agencies/fleet-sustainability.page), in order to determine what equipment is available.

2. Where ICE powered equipment is necessary, efforts should be taken to ensure the most efficient ICE engines are used. This may include:

a. The use of larger efficient ICE generators to power multiple pieces of electric equipment,
b. Reductions in the use of less than 50HP engines,
c. Use of lower emission or renewable fuels, such as biodiesel or CNG,
d. Use of hybrid electric equipment, and
e. Other innovative methods proposed by the Contractor.

3. The Contractor is required to coordinate between all Subcontractors and trades in order to reduce the number of ICE equipment and generators in use.

PART II - PRODUCTS (Not Used)

PART III - EXECUTION (Not Used)

END OF SECTION 01 81 21

SECTION 01 91 13
GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 91 13

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. The OPR and BOD documents are included by reference for information only.

C. The Commissioning Plan, prepared by the Commissioning Agent (CxA) under separate contract with the City of New York, contains requirements that apply to this section.

1.2 SUMMARY:

A. This section includes general requirements that apply to implementation of Commissioning without regard to systems, subsystems and equipment being commissioned. General Requirements for building enclosure commissioning are addressed in a separate specification.

B. This Section includes:

1. Definitions
2. Commissioning Team
3. City's Responsibilities
4. Contractor's Responsibilities
5. CxA Responsibilities
6. Commissioning Documentation
7. Submittals
8. Coordination
9. Test Equipment
10. Commissioning Process
11. Commissioning Plan and Schedule
12. General Testing Requirements
13. Testing Procedures
14. Deficiencies
15. Operation & Maintenance Manuals
16. Demonstration and Instruction
17. Guaranty Review / Seasonal Testing
18. Record Drawings

1.3 RELATED SECTIONS:

A. System-Specific Commissioning requirements indicated in other sections of the Project Specifications for specific requirements for commissioning systems.

B. This Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED procedures, and specific commissioning requirements of the Project Specifications, whichever is more stringent. The Contractor must cooperate with the CxA and provide whatever assistance is required.

C. Related sections include, without limitation, the following:

1.	Section 01 10 00	SUMMARY
2.	Section 01 31 00	PROJECT MANAGEMENT AND COORDINATION
3.	Section 01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
4.	Section 01 78 39	CONTRACT RECORD DOCUMENTS
5.	Section 01 79 00	DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION
6.	Section 01 81 13.03	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS
7.	Section 01 81 13.04	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS
8.	Section 01 91 15	GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Basis of Design (BOD)	A document, prepared by the Design Consultant, that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
Checklists	Forms that outline the step-by-step process that must be executed to fulfill the test requirements and to verify that materials, equipment, assemblies and systems are installed in accordance with the Contract Documents. The CxA must develop the checklists; the Contractor must complete them.
Construction Checklist	Form used by Contractor and the CxA to verify that appropriate work components for the Project are on-site, ready for installation, correctly installed, and functional.
Commissioning	Commissioning is a systematic process of ensuring and documenting that the building systems have been installed in the prescribed manner, are functionally checked and capable of being operated and maintained to perform with the design intent and have documentation to support proper installation and operation. The process does not eliminate or reduce the responsibility of the installing Subcontractors to provide a finished product.
Commissioning Agent (Aka Commissioning Authority) (CxA)	Consultant under separate contract with the City of New York to provide Commissioning services for this Project. The CxA must not be an employee of the Contractor, nor will the CxA have any interest in the Contract.
Commissioning Plan	A document developed by the CxA that outlines the organization, schedule, roles and responsibilities, allocation of resources, and documentation requirements of the commissioning process.
Deferred Performance Tests	Performance tests that are performed, at the discretion of the CxA, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design, or other site conditions that disallow the test from being performed.
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and Specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Factory Testing	Testing of equipment on-site or at the factory, by factory personnel, with or without the City's representative.

Functional Performance Test (FPT)	Functional performance testing includes the dynamic functions and operations of equipment and systems using manual or monitoring methods under various levels of operation. Systems are tested under various modes, such as during low cooling loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarms, power failure, etc. The systems are run through all the control system's sequences of operation and components are verified to respond as the sequences state. Such tests must be performed as per the protocol written by the CxA which defines the methods, personnel and expectations.
Issue (or Deficiency)	A condition in the installation or function of a component, piece of equipment, or system that is not in compliance with the Contract Documents.
Issues Log	A formal and ongoing record of problems, deficiencies or concerns that have been raised by members of the Commissioning Team during the course of commissioning. The Issues Log is the primary tracking tool to address all Commissioning Issues by concerned parties. All Issues must be addressed and resolved by the concerned parties before the closeout of the Project. This log tracks the resolution performed and date of closure of each Issue.
Master Equipment List (MEL)	A complete listing of all commissioned building equipment, including details such as make, model, location, ID Tag number, etc. that is taken from submittals and is the basis from which checklists will be generated. The MEL is a spreadsheet which is also used as a tracking tool for all milestones of the commissioning process, such as the creation and performance of checklists, startup of equipment, TAB work, etc.
Monitoring	The recording of parameters (flow, current, status, pressure, etc.) of equipment operation using data loggers or the trending capabilities of control systems.
Owner (City of New York) Contracted Tests	Tests paid for by the City of New York outside of the Contractor's Contract and for which the CxA does not provide oversight. These tests will not be repeated during functional testing if properly documented.
Owner's Project Requirements (OPR)	A document, prepared by the Design Consultant that details the functional requirements of a Project and the expectations of how it will be used and operated. These include Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.
Pre-functional (Installation) Checklists	A list of items to inspect and elementary component tests to conduct to verify proper installation of equipment, provided by the CxA to the Contractor. Installation checklists are primarily static inspections and procedures to prepare equipment or systems for initial operation. Pre-functional (Installation) checklists augment, and are combined with, the manufacturer's startup checklist. The Checklists are filled out by the Contractor and reviewed by the CxA.
Sampling	Functional testing for a percentage of the total number of identical or near-identical pieces of equipment.
Seasonal Performance Tests	Functional tests that are deferred until, or performed again when, the system(s) will experience climate conditions close to their design conditions.
Startup	The initial starting or activating of equipment, including executing construction checklists.
Systems, Subsystems, Equipment, and Components	Where these terms are used together or separately, they mean "as-built" systems, subsystems, equipment, and components.

Systems Manual	A system-focused composite document that includes the Operation and Maintenance Manual, and additional information of use to the owner during the occupancy and operations phase.
Testing, Adjusting and Balancing (TAB)	Testing, adjusting, and balancing of the Heating Hot Water (HHW), Chilled Water (CHW) and Heating, Cooling, and Ventilation Airflow distribution system flows and pressures as specified in Contract Documents by a Subcontractor certified to perform such work.
Test Requirements	Requirements specifying what modes and functions, etc. must be tested on any given piece of equipment or any given system (integrated or standalone). The test requirements are not the detailed test procedures. The test requirements for each system are specified in the respective Contract Documents.
Trending	Monitoring using the building controls system, and analysis of the data gathered over a period of time.

1.5 COMMISSIONING TEAM:

A. Members Appointed by the Contractor and its Subcontractors: Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the Commissioning process through coordinated actions. The Commissioning Team will consist of, but not be limited to, representatives of the Contractor, including Project superintendent and Subcontractors, installers, suppliers and specialists deemed appropriate by the CxA.

B. Members Appointed by the City:

1. Commissioning Authority/Agent (CxA): The designated person, company, or entity under separate Contract with the City that plans, schedules and coordinates the Commissioning Team to implement the commissioning process.

2. Representatives of the facility user and operation and maintenance personnel.

3. Design Consultant and other concerned entities.

1.6 CITY'S RESPONSIBILITIES:

A. Provide the OPR and BOD documentation to the CxA for use in developing the Commissioning Plan; systems manual; operation and maintenance orientation plan; and testing plans and checklists.

B. Assign operation and maintenance personnel to participate in Commissioning Team activities.

C. Provide full details and results of any Owner- contracted tests relevant to the current Project.

1.7 CONTRACTOR'S RESPONSIBILITIES:

A. The Contractor must provide utility services required for the commissioning process.

B. As a member of the Commissioning Team, the Contractor and Subcontractors must assign representatives with expertise and authority to act on behalf of the Contractor and its Subcontractor and schedule them to participate in and perform Commissioning Team activities including, but not limited to, the following:

1. Participate in scheduled construction-phase coordination and Commissioning Team meetings.

2. Integrate and coordinate commissioning process activities with the construction schedule.

3. Provide all factory acceptance test reports to the CxA through the Commissioner.

4. Respond to any additional specific information requests from the CxA. CxA may request additional documentation necessary for the commissioning process. Requests by CxA may precede, be concurrent with, or follow normal submittals.

5. Ensure the cooperation and participation of all Subcontractors and manufacturers of equipment to be commissioned.
6. Verify and confirm that components, equipment, and system are functioning as per design prior to CxA witnessing testing.
7. Perform testing required in the Commissioning schedule as per the Commissioning process test procedures provided by the CxA, providing no less than 48 hours' notice to the CxA through the Commissioner.
8. Coordinate schedule with, and perform Cx activities at the direction of, CxA.
9. Provide technicians, instrumentation, tools, and equipment to perform and document the following:
   a. Cx Construction Checklist verification tests.
   b. Cx Construction Checklist verification test demonstrations.
10. Complete installation checklists as Work is completed and return to CxA through the Commissioner.
11. Provide written responses to the CxA through the Commissioner for resolution of Issues recorded in the Issues Log within five (5) business days.
12. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
13. Submit operation and maintenance manuals for systems and subsystems, and equipment in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS. Such documents must be submitted prior to functional testing.
14. Submit As-Built documents in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
15. Provide orientation sessions for operations and maintenance personnel (sessions will be witnessed by the CxA) in accordance with Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION. Provide no less than 48 hours' notice to the CxA, through the Commissioner. Video record and edit orientation sessions and provide an electronic recording to the CxA and Commissioner no later than two (2) weeks after the orientation session occurs. Edit as requested by the Commissioner.
16. Provide information requested by the CxA for final commissioning documentation.
17. Provide measuring instruments and logging devices to record test data and provide data acquisition equipment to record data for the complete range of testing for the required test period.
18. Provide detailed startup procedures.
19. Provide a written list of all user adjustable set-points and reset schedules with a brief discussion of the purpose of each and the range of reasonable adjustments with energy implications.
20. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.
21. Respond to provided new deficiencies and/or responses within five (5) business days.
22. Gather operation and maintenance literature on all equipment, and assemble in binders as required by the Contract Documents. Submit to CxA 45 days after submittal acceptance.
23. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.

24. Notify the CxA a minimum of two weeks in advance of the time for start of the testing and balancing work. Attend the initial testing and balancing meeting for review of the official testing and balancing procedures.

25. Provide written notification to the Commissioner and CxA that the following work has been completed in accordance with the Contract Documents, and that the equipment, systems, and sub-system are operating as required.

26. The equipment suppliers will document the performance of their equipment.

27. Provide a complete set of record drawings to the CxA prior to the start of Functional Performance Testing.

28. Contractor responsibilities to be completed by Equipment Suppliers:

    a. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the City of New York's personnel, to keep warranties in force.

    b. Assist in equipment testing.

    c. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

1.8 COMMISSIONING AGENT'S (CxA) RESPONSIBILITIES:

A. Organize and lead the Commissioning Team.

B. Prepare a construction-phase Commissioning Plan. Collaborate through the Commissioner with Contractor and with Subcontractors to develop test and inspection procedures. Include design changes and coordinate Commissioning activities with the overall Project schedule. Identify Commissioning Team member responsibilities, by name, firm, and trade specialty, for performance of each commissioning task. Update the Commissioning Plan during construction as required.

C. Review and comment in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, on submittals from the Contractor for compliance with the OPR, BOD, Contract Documents, and construction-phase Commissioning Plan. Review and comment on performance expectations of systems and equipment and interface between systems relating to the OPR and BOD.

D. Coordinate with the Commissioner, in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION, to convene Commissioning Team meetings for the purpose of coordination, communication and conflict resolution; discuss progress of the commissioning processes.

E. At the beginning of the construction phase, coordinate with the Commissioner's kick-off meeting schedule to conduct an initial construction-phase coordination meeting for the purpose of reviewing the Commissioning activities and establishing tentative schedules for operation and maintenance submittals, operation and maintenance orientation sessions, TAB Work, testing, and Project completion.

F. Perform site visits to observe and inspect construction as described in the Commissioning Plan. Report progress and deficiencies to the Commissioner. In addition to compliance with the OPR, BOD, and Contract Documents, inspect systems and equipment installation for adequate accessibility required for component maintenance replacement and repair.

G. Prepare and distribute project-specific test and inspection procedures and checklists and maintain MEL.

H. Verify air and water systems balancing by sampling, reviewing completed reports and selected site observation. Coordinate submittal reviews with the Commissioner so that the comments are combined into a single review and submitted to the Contractor.

I. Coordinate with the Commissioner to witness and document tests, inspections and systems startup, as per the Commissioning Plan.

J. Maintain an Issues Log and a record of functional testing. Report all Issues as they occur to the Commissioner.

K. Compile test data, inspection reports and certificates, and include them in the systems manual and Commissioning Report.

L. Certify date of acceptance and startup for each item of equipment for start of warranty periods.

M. Review and comment on operation and maintenance documentation and systems manual outline for compliance with the OPR, BOD, and Contract Documents. Operation and maintenance documentation requirements are specified in other sections of the Project Specifications and described in Section 01 78 39 CONTRACT RECORD DOCUMENTS.

N. Review agenda for orientation; witness and confirm orientation session conforms with agenda and Contract Documents; review recording of demonstration and orientation sessions provided by the Contractor on USB drive or other electronic media as requested by the Commissioner and provide appropriate comments for editing.

O. Return to the site ten (10) months into the twelve (12)-month guaranty period, to review with facility staff the current building operation and the condition of outstanding Issues related to the original and seasonal commissioning. Interview facility staff and identify problems or concerns they have with operating the building as originally intended.

P. Prepare Commissioning Reports.

Q. Assemble the final commissioning documentation, including the Commissioning Report and Systems Manual.

R. Perform all CxA tasks as defined by LEED and the NYC Energy Conservation Code; prepare LEED submittal documents and preliminary and final Commissioning Reports as required by the NYC Energy Conservation Code.

1.9 COMMISSIONING DOCUMENTATION:

The Contractor must assist the CxA in the development and compiling of the following Commissioning Documentation:

A. Index of Commissioning Documents: The CxA will prepare an index including the storage location of each document.

B. Commissioning Plan: A document prepared by the CxA that outlines the schedule, allocation of resources, roles and responsibilities, and documentation requirements of the Commissioning process. Within 30 days of receipt of the Commissioning Plan, the Contractor must review the plan and document any issues or concerns with RFIs in compliance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.

C. Test Checklists: The CxA will develop test checklists for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for comments, for each item to be tested. The CxA will prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. Space will be provided for testing personnel to sign off on each checklist. Specific checklist content requirements are specified in other sections of the Project Specifications, but must include without limitation:

1. Identification of tested item
2. Date of test
3. Indication of whether the record is for a first test or retest following correction of a problem or Issue
4. Dated signatures of the person performing the test and of the witness if applicable

5. Deficiencies and Issues, if any, generated as a result of the test

D. Inspection Checklists will be signed by the Contractor, Subcontractor(s), Installer(s), and CxA certifying that systems, subsystems, equipment, and associated controls are ready for testing.

E. Test and Inspection Reports: The CxA will record test data, observations, and measurements on test checklists. Photographs, forms, and other means appropriate for the application will be included with data. CxA must compile test and inspection reports and test and inspection certificates and include them in systems manual and Commissioning Report.

F. Corrective Action Documents: The CxA will document corrective action taken for systems and equipment that fail tests and include required modifications to systems and equipment and revisions to test procedures, if any. The Contractor must retest systems and equipment requiring corrective action. The CxA will document retest results.

G. Issues Log: The CxA will prepare and maintain an Issues Log that describes design, installation, and performance Issues that are at variance with the OPR, BOD, and Contract Documents. The log will identify and track Issues as they are encountered, documenting the status of unresolved and resolved Issues. The Issues Log will identify, at a minimum:

1. The party responsible for correcting the Issue,
2. The person documenting the Issue resolution,
3. The exact location of the Issue (floor and room),
4. The applicable system component,
5. A detailed description of the Issue,
6. The Issue status, and
7. The date the Issue was discovered and the date the Issue was resolved.

H. Commissioning Report: The CxA will document results of the commissioning process including unresolved Issues and performance of systems, subsystems, and equipment. The Commissioning Report will indicate whether systems, subsystems, and equipment have been completed and are performing according to the OPR, BOD, and Contract Documents. The Commissioning Report must include:

1. An executive summary, including participants and their roles, a brief building description, an overview of the commissioning and testing scope, and a general description of testing and verification methods,
2. Installation/Pre-Functional Checklists,
3. Start-up reports,
4. Functional Test documentation,
5. Trend Log Analysis,
6. The final Issues Log, with all Issues identified through the commissioning process, identifying which, if any, Issues remain unresolved,
7. The Commissioning Plan,
8. Commissioning progress and field reports,
9. Commissioning review documents, and
10. Record of owner’s orientation.

I. Systems Manual: The CxA will gather required information and compile systems manual as specified in other sections of the Project Specifications and described in Section 01 78 39 CONTRACT RECORD DOCUMENTS.

1.10 SUBMITTALS:

A. Submittal of shop drawings, product data, samples, etc., relevant to commissioning must be provided to the CxA as requested. Such submittals must be in compliance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. As-Built Contract Record Drawings and Operating and Maintenance Manuals relevant to commissioning must be provided to the CxA as requested. Such submittals must be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.

C. All demonstration and orientation submittals relevant to commissioning must be provided to the CxA as requested. Such submittals must be in compliance with Section 01 79 00 DEMONSTRATION AND OWNER'S PREACCEPTANCE ORIENTATION.

D. Completed Prefunctional (Installation) Checklists must be provided to the CxA prior to equipment startup.

1.11 COORDINATION:

A. Coordination of Commissioning is the responsibility of all Commissioning Team members.

B. Coordinating Meetings: The CxA will coordinate with the Commissioner's regularly scheduled construction progress meetings to conduct coordination meetings of the Commissioning Team to review progress on the Commissioning Plan, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities. Commissioner and Contractor must ensure that all required Commissioning Team members attend.

C. Commissioning Kick-Off Meeting – Construction Team: The Contractor will attend a meeting of the Commissioning Team, chaired by the CxA, to review the scope of commissioning process activities and the Commissioning Plan with discussions on milestones, activities, and assignments of responsibilities. The flow and type of documents and the amount of submittal data given to the CxA will be determined. Meeting minutes will then be distributed to all parties by the CxA.

D. Commissioning Meetings: The Contractor will attend coordination meetings with the Commissioning Team, chaired by the CxA, to review progress on the Commissioning Plan, construction deficiencies, scheduling conflicts, and to discuss strategies and processes for upcoming commissioning process activities.

E. Miscellaneous Construction Meetings: The CxA attends selected planning and job-site meetings in order to remain informed on construction progress and to update parties involved in the commissioning process. This will not include 100% meeting attendance, but the CxA will be provided with the subsequent meeting minutes for review.

F. Construction Documents: The Contractor, through the Commissioner, will furnish copies of all construction documents, addenda, change orders and appropriate submittals and shop drawings to the CxA.

G. Pre-testing Meetings: The CxA will coordinate with the Commissioner to conduct pretest meetings of the Commissioning Team to review startup reports, pretest inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested. The Commissioner, Contractor, and all required Commissioning Team members will attend pretest meetings.

H. Testing Coordination: The Contractor will coordinate with testing personnel and agencies for timing and access for CxA to witness test. The CxA will advise the Commissioning Team as to the sequence of testing activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

I. Manufacturers' Field Services: The Contractor must coordinate manufacturers' field services, as per the Commissioning Plan.

J. The CxA will regularly apprise the Commissioner of progress, pending problems and/or disputes, as well as provide regular status reports on progress with each system.

PART II – PRODUCTS

2.1 TEST EQUIPMENT:

A. All industry standard test equipment required for performing the specific tests must be provided by the Contractor responsible for testing. Any proprietary Vendor-specific test equipment must be provided by that Vendor or Manufacturer.

B. Special equipment, tools, instruments, software, and equipment communication network access hardware and software (only available from Vendor, specific to the piece of equipment) required for testing equipment according to the Contract Documents must be included at no extra cost to the City and must be turned over to the City at Project close-out, except for stand-alone data logging equipment that may be used by the CxA.

C. Any portable or handheld setup and/or calibration devices required to initialize the control system must be made available by the control vendor for use by the CxA at no additional cost to the City.

D. The instrumentation used in the commissioning process must comply with the following:

1. Be of sufficient quality and accuracy to test and/or measure system performance within the tolerances required

2. Be calibrated at the manufacturer’s recommended intervals with calibration tags permanently affixed to the instrument

3. Be maintained in good repair and operating condition throughout use duration on this Project

4. Be immediately recalibrated or repaired if dropped and/or damaged in any way during this Project.

PART III – EXECUTION

3.1 COMMISSIONING PROCESS:

A. The following provides an overview of the Commissioning tasks during Project construction and the general order in which they occur.

1. Construction-phase Commissioning begins with a Commissioning Kickoff Meeting, conducted by the CxA through the Commissioner in accordance with section 01 31 00 PROJECT MANAGEMENT AND COORDINATION, where the Commissioning process is reviewed with all the Commissioning Team Members.

2. Additional meetings may be required throughout construction, scheduled by the CxA through the Commissioner in accordance with 01 31 00 PROJECT MANAGEMENT AND COORDINATION with necessary parties attending, to plan, scope, coordinate and schedule future activities and resolve open Issues.

3. The CxA will review the Contractor submittals concurrent with the Commissioner and provide comments to the Commissioner for inclusion in their review. The reviewed submittals will include all commissioned equipment information, including detailed startup procedures, and coordination drawings that include commissioned equipment and systems, control drawings and sequences, and interfaces and interlocks between systems.

4. The CxA works with the Commissioner and Contractor in developing Pre-functional and Functional Test documentation formats.

5. Periodically throughout the construction process, the CxA will perform site visits to observe component and system installations.

6. The checkout and performance verification generally proceeds from component level to equipment to systems and intersystem levels. Pre-functional (Installation) Checklists are to be completed before equipment startup. Equipment startup must be completed before TAB. TAB must be completed before the Functional Performance Checklists.

7. The Contractor must, with guidance from the CxA, execute and document the Pre-Functional (Installation) Checklists and perform startup and initial checkout of equipment and systems. The CxA documents that the checklists and startup are completed according to the approved plans. This will include the CxA witnessing selected assembly markups, portions of the startup of selected equipment, and spot checking the Pre-Functional (Installation) Checklists.

8. The CxA develops specific equipment and system Functional Checklists. The Contractor receives a copy of the procedure through the Commissioner. The CxA may request additional design narrative from the Commissioner and Controls Subcontractor, depending on the completeness of the Basis of Design and sequences provided within the design documents.

9. The Functional Checklists are executed by the Contractor and witnessed and documented by the CxA.

10. Items of non-compliance in material, installation startup, and operation are corrected and the equipment or system is rechecked. The CxA will maintain an Issues Log to track Issues and Issue resolution.

11. The CxA will review the operation & maintenance documentation for completeness.

12. Commissioning, excluding the Warranty Walkthrough and any seasonal testing at the written direction of the Commissioner, must be completed prior to Substantial Completion.

13. The CxA reviews the orientation documentation. The orientation schedules and agenda are provided by the Subcontractors. The CxA verifies that orientation is completed, attended by the appropriate City of New York personnel, is thorough and provides all necessary information required to operate and service the equipment or system.

14. Deferred testing/checkouts are conducted, as specified or required in the Contract Documents.

3.2 COMMISSIONING PLAN AND SCHEDULE:

A. Commissioning Plan: The Commissioning Plan provides guidance in the execution of the commissioning process. After the initial construction phase Commissioning kickoff meeting, the CxA will update the plan. This plan is a living document that must evolve and expand as the Project progresses. The Commissioning Plan must include:

1. Description of the facility and Project.

2. Description of the commissioning process and associated deliverable documents.

3. Description of equipment and systems to be commissioned.

4. Description of schedules for testing procedures along with identification of parties involved in performing and verifying tests.

5. Sample rates for equipment to be tested.

6. Identification of task items that must be completed before the next operation can proceed.

7. Description of responsibilities of Commissioning Team members.

8. Description of observations to be made and reported on during testing and witnessing of testing by all parties involved in the Project.

B. Commissioning Schedule: Contractor must provide construction schedules to the CxA, in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION. The CxA will develop and submit a schedule identifying the commissioning process and provide commissioning scheduling information to the Commissioner and Contractor for review and planning activities. The Contractor must incorporate the CxA's activities into the Project schedule.

3.3 GENERAL TESTING REQUIREMENTS:

A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.

B. Tests will be performed using design conditions whenever possible.

C. Simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by the CxA and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.

D. The CxA may direct that set points be altered when simulating conditions are not practical.

E. The CxA may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are not practical.

F. If tests cannot be completed because of a deficiency outside the scope of the HVAC system, document the deficiency and report it to the Commissioner. After deficiencies are resolved, reschedule tests.

G. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

H. Refer to individual Commissioning specification sections for additional testing requirements.

3.4 TESTING PROCEDURES:

A. The CxA will determine and document the acceptance procedures for each system within disciplines. The acceptance procedures must incorporate the commissioning standards and successful testing results as referred to throughout the Specifications.

B. The CxA will provide performance checklists and performance checkout data sheets for each system based on actual system configuration. Special emphasis must be placed on checkout procedures that must conclusively determine actual system performance and compliance with the OPR and BoD.

C. The Contractor and appropriate Vendor(s) must be informed of what tests are to be performed and the expected results. The Commissioning Plan must address the test requirements and be distributed to all parties involved with that system.

D. Prior to Functional Testing, the Contractor must provide the following:

1. Contractor must certify in writing that commissioned systems, subsystems, and equipment have been installed, calibrated and started, and are operating according to the Contract Documents and approved submittals.

2. Contractor must certify in writing that all relevant instrumentation and control systems have been completed and calibrated,

3. Contractor must certify point-to-point checkout has been successfully completed, and that systems are operating in accordance with their design sequence of operation, Contract Documents, and approved submittals.

4. Contractor must certify that all sensors are operating within specified accuracy and all systems are set to and maintaining set points as required by the Contract Documents.

5. Contractor must certify in writing that TAB procedures have been completed, and that the TAB report has been submitted, discrepancies corrected, and corrective work approved.

6. Contractor must perform tests for system and intersystem performance only after CxA and Commissioner have approved the completed testing checklists for systems, subsystems, and equipment.

7. Contractor must inspect and verify the position of each device and interlock identified on checklists.

8. Contractor must check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.

9. Set systems, subsystems, and equipment into operating mode to be tested in accordance with approved test procedures (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).

10. Contractor must install measuring instruments and logging devices to record test data as directed by the CxA.

E. The Functional Performance tests must be performed by the Contractor and Vendor(s) with oversight by the CxA. The CxA must witness, verify, and document these tests.

1. Functional Performance Tests must include operating the systems and components through each of the written sequences of operation, other significant modes of miscellaneous alarms, power failure, and security alarm when impacted by and interlocked with commissioned equipment, as detailed in the Commissioning Plan.

2. Checklists must be completed comprehensively and to the extent necessary to enable the CxA to assure the Commissioner that the systems perform as per the OPR, BOD, and Contract Documents.

3. If a test is failed for any reason and retesting is required, the Contractor must provide retesting at no additional cost to the City.

4. If a test must be witnessed more than twice by the Commissioning Agent due to repeated failure to perform as per the design documents, the Contractor must be responsible for the Commissioning Agent’s fee for witnessing repeated tests beyond the second incidence. Such fee will be negotiated between the Commissioning Agent and the Commissioner.

5. After testing, Contractor must return settings to normal operating conditions.

3.5 DEFICIENCIES:

A. Deficiencies/Non-Conformance.

1. The CxA will record the results of the functional test on the test form. All deficiencies or non-conformance items must be noted and reported to the Commissioner and the Contractor on a standardized form.

2. The Contractor must respond to new deficiencies within five (5) business days. The response must either indicate the issue will be corrected with anticipated date of completion indicated or the response should clearly indicate why the Contractor disputes the claim while referencing the Contract Documents in dispute or requesting further information to clarify the concern.

3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA.

4. Every effort must be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.

5. As tests progress and a deficiency is identified, the CxA discusses the issue with the Contractor.

6. When there is no dispute on the deficiency and the Contractor accepts responsibility to correct it, the CxA documents the deficiency and the Contractor's response and intentions or corrections. The CxA and Contractor then proceed to another test or sequence. Once the Contractor corrects the deficiency, the test is rescheduled and repeated in the anticipation of correct operation or function.

7. When there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible, the CxA documents the deficiency and the Contractor's response. The deficiency is then forwarded to parties assumed to be responsible for the deficiency. Resolutions are made at the lowest management level possible. Other parties are brought into the discussion as needed. Final interpretive authority is with the Commissioner. Final acceptance authority is with the Commissioner and CxA. The CxA will then document the resolution process. Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency. The CxA then reschedules the test as stated in the section above.

8. Deficiencies that are not corrected at the time of documentation, must be completed by the affected subcontractor and photo evidence of the deficiency resolution must be sent by the Contractor to both the Commissioner and the CxA.

B. Failure due to Manufacturer Defect.

1. The CxA and Commissioner will determine the equipment to be tested. If 10% of the equipment being tested, or three identical pieces of the equipment tested (irrespective of equipment unit size), whichever is greater, fail to perform due to manufacturing defect (mechanically or substantively), not allowing it to meet its submitted performance requirements, all identical pieces of equipment may be considered unacceptable by the CxA and the Commissioner. In such case, the Contractor must provide the Commissioner with the following:

   a. Within one week of notification from the Contractor, the manufacturer's representative will examine all other identical units making a record of the findings. The findings must be provided to the Commissioner within two weeks of the original notice.

b. Within two weeks of the original notification, the Contractor or manufacturer will provide a signed and dated written explanation of the problem, cause of failures, etc., and all proposed solutions which shall include full equipment submittals. The proposed solutions must not significantly exceed the specification requirements of the original installation.

c. Commissioner will determine whether a replacement of all identical units or a repair is acceptable.

d. Two examples of the proposed solution will be installed by the Contractor and the Contractor will be allowed to test the installations for up to one week, upon which the Commissioner will decide whether to accept the solution.

e. Upon acceptance, the Contractor and/or manufacturer must replace or repair all identical items, at their expense, and extend the manufacturer's warranty accordingly, if the original equipment warranty had begun. The replacement/repair work must proceed with reasonable speed beginning within one week from when parts can be obtained.

3.6 OPERATION & MAINTENANCE MANUALS:

A. General

1. The CxA must review the operation & maintenance manuals provided by the Contractor for completeness of the document. The review process will verify that operation & maintenance instructions meet Specifications and are included for all commissioned equipment furnished by the Contractor.

2. The CxA will communicate deficiencies in the manuals to the Contractor, or Commissioner, as requested. Upon a successful review of the corrections, the CxA recommends approval and acceptance of these sections of the operation & maintenance manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

3. Published literature will be specifically oriented to the provided equipment, indicating required operation and maintenance procedures, parts lists, assembly / disassembly diagrams and related information.

4. The Contractor must incorporate the standard technical literature into system-specific formats for this facility as designed and as actually installed. The resulting operation & maintenance information must be system-specific, concise, to the point and tailored specifically to this facility. The CxA must review these documents as necessary for final corrections by the Contractor.

5. Contractor must submit operations & maintenance manuals for each piece of equipment for review no later than 45 days after submittal approval.

B. The operation & maintenance manual review and coordination efforts must be completed prior to Owner orientation sessions, as these documents are to be utilized in the orientation sessions.

C. System Operations Manual

1. The CxA must prepare and deliver these documents with inputs from the Contractor. The Contractor must provide all required documents to the CxA, through the Commissioner. The required documents must be described in the Commissioning Plan and Contract Documents. Typically, the manual includes the following:

a. System, subsystem, and equipment descriptions.

b. Commissioned systems single line diagrams (to be provided by Mechanical, Electrical, Plumbing, and Building Management System (BMS) Subcontractors).

c. As built sequences of operations, control drawings and original set points (to be provided by Design Consultant and BMS Subcontractor).

d. Operating instructions for integrated building systems (to be provided by Mechanical and BMS Subcontractors).

e. Recommended schedule of maintenance requirements and frequency (to be provided by Subcontractors).

f. Recommended schedule for calibrating sensors and actuators (to be provided by BMS Subcontractor).

3.7 DEMONSTRATION AND INSTRUCTION:

A. The Contractor must schedule and coordinate instruction sessions for the facility's staff for each commissioned system. Demonstrations must be held per Contract Documents, along with the appropriate schematics, handouts and visual / audio orientation aids onsite with equipment.

B. The equipment vendors must provide instruction on the specifics of each major equipment item including philosophy, troubleshooting and repair techniques.

C. The Contractor must record and edit demonstration and orientation sessions, and provide these records to the CxA, through the Commissioner.

D. For additional direction pertinent to instruction, refer to other specific specification sections for demonstration and instruction requirements.

E. The Contractor will be responsible for instruction coordination, scheduling, and completion of demonstrations and instructions.

F. The CxA will oversee the instruction of the City of New York's personnel for commissioned equipment and systems.

1. The CxA will interview the City of New York's personnel to determine the special needs and areas where instruction will be most valuable. The Commissioner and CxA will decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA will communicate the results to the Contractor who will ensure participation by the Subcontractors.

2. In addition to these general requirements, the specific instruction requirements of the City of New York's personnel by the Contractor are specified in the DDC's General Conditions Section 017900 "Demonstration and Owners' Pre-Acceptance Orientation."

3. The Contractor must ensure that each Subcontractor and vendor responsible for instruction will submit a written instruction plan to the Contractor for review and approval prior to instruction. The Contractor will submit one comprehensive instruction plan to the CxA and the Commissioner.

4. The plan will be reviewed by the CxA and the Commissioner. Comments pertaining to its deficiencies will be forwarded to the Contractor. The instruction plan will be rewritten until approved by the CxA and the Commissioner. The final approved instruction plan will cover the following elements:

a. Equipment (included in instruction)

b. Intended audience

c. Location of instruction

d. Objectives

e. Subjects covered (description, duration of discussion, special methods, etc.)

f. Duration of instruction on each subject

g. Qualified instructor for each subject

h. Instructor qualifications

i. Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)

5. Instruction documentation must include the following items:

a. Copy of the instruction plan, including schedule, syllabus, and agenda.

b. Copy of the Owner's Project Requirements.

c. Compiled operations manuals.

d. Compiled maintenance manuals.

e. Completed manufacturer instruction manuals.

f. Record drawings.

6. The CxA develops criteria for determining that the instruction was satisfactorily completed, including attending the instruction, etc. The CxA recommends approval of the instruction to the Commissioner using a standard form. The Commissioner signs the approval form/letter template.

7. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment.

8. Video recording of the instruction sessions will be verified by the CxA in electronic format, at the discretion of the Commissioner.

3.8 GUARANTY REVIEW / SEASONAL TESTING

A. Seasonal Testing – During the twelve (12)-month guaranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) must be completed as part of this Contract. The CxA will coordinate this activity. Tests will be executed and documented, and deficiencies will be corrected by the Contractor, with facilities staff and the CxA witnessing. Any final adjustments to the operation & maintenance manuals and record documents due to seasonal testing will be made by the Contractor.

B. The CxA will return upon the start of the new season (cooling or heating) after Project completion to conduct performance tests that could not be performed due to ambient conditions. The seasonal testing will only be performed if suitable loads / conditions were unavailable during the performance testing stages (in other words; the requirement for testing is warranted), and at the written direction of the Commissioner.

C. The CxA will return to the site approximately ten (10) months into the twelve (12)-month guaranty period and interview the occupants and maintenance staff, review the operation of the building, provide recommendations for installation and operational problems and document guaranty and operational issues in the Issues database.

3.9 RECORD DRAWINGS

A. The CxA must review the as built Contract Documents to verify incorporation of both design changes and as-built construction details. Discrepancies noted must be corrected by the appropriate party.

END OF SECTION 01 91 13

SECTION 01 91 15
GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 91 15

PART I – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. The Owner's Project Requirements (OPR) and Basis of Design (BOD) documents are included by reference for information only.

C. The Commissioning Plan, prepared by the Commissioning Agent (CxA) under separate contract with the City of New York, contains requirements that apply to this section.

1.2 SECTION INCLUDES

A. This section includes the commissioning requirements for the Building Enclosure systems. Refer to "Exterior Enclosure Commissioning" in other sections of the Project Specifications for specific requirements regarding Building Enclosure Commissioning.

1. The commissioning requirements for the Building Enclosure systems given in this section are entirely separate from, and in addition to, the Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for this Project. The Contractor, and its Suppliers, Subcontractors, Vendors, etc., are required to participate in both commissioning processes as required.

1.3 DESCRIPTION

A. Building Enclosure Commissioning (BECx) is a systematic process of ensuring all building enclosure systems responsible for environmental separation perform as per the OPR and BOD. The BECx process is intended to verify and document proper installation and performance of building enclosure materials and systems in accordance with the Contract Documents.

B. Commissioning does not take away from, or reduce, the Contractor's responsibility to provide a finished and fully functioning product and installation.

C. This section will in no way diminish the responsibility of the Contractor in performing all aspects of work and testing as outlined in the Contract Documents. Any requirements outlined in this section are in addition to requirements outlined in the Contract Drawings and Specifications.

1.4 RELATED WORK

A. Specific BECx requirements are given in this Section. The following Project Specification sections are related to the commissioning work specified in this section:

1. Basic Concrete Requirements: Refer to Division 03
2. Basic Metal Requirements: Refer to Division 05
3. Basic Waterproofing, Roofing, Air Barrier and Insulation Requirements: Refer to Division 07
4. Basic Fenestrations Requirements: Refer to Division 08
5. Basic Finishing Requirements: Refer to Division 09

1.5 DEFINITIONS AND ABBREVIATIONS

A. Refer to Article 2 of the Contract and Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for terms, words, and expressions not otherwise defined herein.

Approval	Acceptance that a material or system has been properly installed and is functioning in tested modes according to the Contract Documents.
Building Enclosure Commissioning Agent (BECA)	BECA directs and coordinates day-to-day BECx commissioning activities.
Building Enclosure Testing Agency (BETA)	Building Enclosure Testing Agency whom is an independent agency retained by the Contractor and approved by the Commissioner, fully accredited by the appropriate governing body for each of the materials, components or systems to be tested or evaluated for compliance with requirements of the Contract Documents and as directed by the BECA. Documentation of such certification must be submitted to and approved by the Commissioner prior to the start of any work by the BETA.
Commissioning	Commissioning is a systematic process of ensuring and documenting that the building systems have been installed in the prescribed manner, are functionally checked and capable of being operated and maintained to perform with the design intent, and have documentation to support proper installation and operation. The process does not eliminate or reduce the responsibility of the installing Subcontractors to provide a finished product.
Commissioning Agent (CxA)	Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
Commissioning Plan	Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
Deficiency	Condition of a building enclosure material or system that is not in compliance with Contract Documents (that is, does not perform properly or does not comply with design intent).
Design Consultant	Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
Simulated Condition	Condition created for testing component or system (e.g., applying pressure differential across the building enclosure concurrent with water spray to simulate a wind driven rain).
Mock-up	The activities where systems or materials are initially constructed and tested.

1.6 COORDINATION

A. Building Enclosure Commissioning Team: Members of the Building Enclosure Commissioning Team will consist of:

1. CxA
2. BECA
3. BETA
4. Commissioner
5. Contractor, and all Building Enclosure Subcontractors
6. Design Consultant

B. Management: City of New York will contract services of the BECA through a separate contract. The BECA will direct and coordinate commissioning activities and report to the Commissioner. All members of the

Building Enclosure Commissioning Team must cooperate to fulfill contracted responsibilities and objectives of the Contract Documents.

C. Scheduling: BECA must work with the Building Enclosure Commissioning Team to establish required commissioning activities to incorporate into the preliminary commissioning schedule. The Contractor must integrate commissioning activities into master construction schedule, in accordance with Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION. Necessary notifications are to be made in a timely manner in order to expedite commissioning.

1.7 SUBMITTALS

A. Contractor must provide documentation required for commissioning work in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. At minimum, documentation must include, but not be limited to:

1. Submittal of shop drawings, product data, samples, etc., relevant to BECx and as requested by the BECA. Such submittals must be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
2. As-Built Record Drawings and Operation and Maintenance Information relevant to BECx and as required by the BECA. Such submittals must be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
3. All demonstration and orientation submittals relevant to BECx and as requested by the BECA. Such submittals must be in compliance with Section 01 79 00 DEMONSTRATION AND OWNER'S PREACCEPTANCE ORIENTATION.
4. Performance data, any performance test procedures, and installation and checkout materials.

B. The Contractor must provide all submittals to the Design Consultant, as per Section 01 33 00 SUBMITTAL PROCEDURES. The Design Consultant will transmit all building enclosure related submittals to the BECA for concurrent review.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 SYSTEMS TO BE COMMISSIONED

A. Building Enclosure systems to be commissioned may include, but are not limited to, Roof waterproofing, including garden roof systems, all penetrations, and transitions; skylights and other sloped glazing; exterior walls, including the air barrier system, water management systems, and thermal insulation; punched windows, window walls, curtain walls, storefronts, glazed entries, doors, and louvers; sealants, expansion joints, and control joints; flashings, including all transitions and end-dams; terrace, balcony, and deck waterproofing; below-grade waterproofing, including drainage, waterproofing and damp proofing; below slab floor barriers; interface and transition conditions between exterior enclosure components and systems; smoke controls and fire separation and stopping; and any other special building enclosure systems, equipment, and controls. Refer to the Contract Documents for clarity.

3.2 RESPONSIBILITIES OF COMMISSIONING TEAM MEMBERS DURING CONSTRUCTION PHASE

A. Responsibilities of the Design Consultant include without limitation the following:

1. Review BECA comments on construction documents and shop drawings.
2. Assist in dispute resolution regarding building enclosure items.
3. Review BECA reports.
4. Incorporate BECA Submittal Review Comments into response on submittals.

B. Responsibilities of the BECA include the following without limitation:

1. Review and comment on Mock-up construction and testing plan as provided by Contractor.
2. Development of BECx Plan.
3. Review of building enclosure shop drawings and submittals, including “approved equal” requests, through the Commissioner in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.
4. Attend combined pre-construction and BECx kick-off meeting.
5. Develop construction checklists for the building enclosure for the Contractor’s use.
6. Observe the construction of a building enclosure Mock-up.
7. Witness the testing of a building enclosure Mock-up.
8. Project meetings / conference calls / coordination.
9. Field monitor installation of exterior enclosure components.
10. Update field report log.
11. Update BECx Plan.
12. Advise on Requests for Information.
13. Assist with the preparation of LEED paperwork.
14. Prepare systems manual, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
15. Complete Maintenance Plan, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
16. Prepare training manual, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
17. Prepare final BECx record and enclosure commissioning close-out documents.
18. Develop on-going BECx Plan.

C. Responsibilities of the Contractor and Building Enclosure Subcontractors include without limitation the following:

1. Review BECx Plan and FPT specification.
2. Attend commissioning kick-off meeting and other Building Enclosure Commissioning Team meetings.
3. Incorporate commissioning activities into the construction schedule.
4. Periodically update Commissioning activities in the construction schedule.
5. Notify Commissioner and BECA of work completion.
6. Verify building enclosure materials and assemblies are ready for functional testing.
7. Retain the services of an approved independent BETA; submit qualifications of independent BETA to Commissioner for approval; coordinate all activities and deliverables of this BETA; ensure all BETA deliverables are provided to the Building Enclosure Commissioning Team.
8. Attend all required material and systems testing.
9. Execute all periodic maintenance or repairs required on started systems from initial Mock-up of equipment to Final Acceptance by Commissioner to prevent material warranties from being voided.
10. Submit maintenance logs of all interim maintenance or repair tasks performed by Contractor.

11. Ensure installation work is complete, is in compliance with Contract Documents, and is ready for Functional Performance Testing. FPT test results will be documented by BECA.
12. Ensure resolution of non-compliance and deficiencies in construction or test results. Obtain written documentation of completion from the appropriate subcontractors.
13. Provide letters of compatibility for adjacent building enclosure materials and assemblies.
14. Facilitate all repairs and retesting of failed condition at no additional cost to the City of New York.
15. Provide all warranty information to BECA.

D. Responsibilities of the BETA include without limitation the following:

1. Attend Commissioning kick-off meeting and other Building Enclosure Commissioning Team meetings.
2. Provide on-site technician and equipment to complete Mock-up and field Functional Performance Testing.
3. Prepare and submit reports to the Commissioner at the conclusion of all testing.
4. Perform retesting and prepare corresponding reports.

3.3 BUILDING ENCLOSURE COMMISSIONING TEAM (BECx) MEETINGS

A. BECx meetings will be held periodically, as determined by the Commissioner and recommended by BECA.

B. Discussions held in BECx meetings must include, but not be limited to: system/materials, mock-up/field, progress, scheduling, testing, documentation, deficiencies, and problem resolution.

C. The Contractor must attend BECx meetings, and must ensure the attendance of required subcontractors, as requested.

3.4 REPORTING

A. BECA will provide status reports to the Commissioner. The Commissioner will provide such status reports to the Contactor, CxA, Design Consultant, and other entities as needed.

B. BECA will submit non-compliance and deficiency reports to Commissioner. The Commissioner will provide such reports to the Contractor, CxA, Design Consultant, and other entities as needed.

C. BECA will provide a final summary report to Commissioner and CxA.

3.5 MOCK-UP AND FINAL CONSTRUCTION

A. Prior to Functional Performance Testing or concealment of functional performance layers within the building enclosure, the Contractor must verify that all assemblies are complete, including deficiency long items, and all Contract requirements are met.

3.6 FUNCTIONAL PERFORMANCE TESTING

A. Objectives and Scope

1. The objective of Functional Performance Testing is to demonstrate that the building enclosure is performing according to documented design intent and Contract Documents. Functional Performance Testing ensures and documents that the building enclosure systems are fully operational. Additionally, during Functional Performance Testing, areas of deficient performance are identified and corrected, improving building enclosure system performance.

B. Development of Test Procedures

1. The purpose of a specific test is to verify and document compliance of the installed enclosure systems with the OPR. Building Enclosure Functional Performance Test Protocols are provided in other sections of the Project Specifications for specific requirements regarding BECx.

C. Coordination and Scheduling

1. Contractor must provide sufficient notice to BECA, through the Commissioner, regarding completion schedule for materials and systems. Testing to be performed in conjunction with site visits. Contractor must schedule Functional Performance Tests with Commissioning Team. BECA must witness and document functional testing of equipment and systems. BETA, as retained by the Contractor, must execute tests under direction of BECA.

2. Successful completion of Mock-up functional performance testing must occur prior to full production installation of building enclosure materials and systems.

3.7 DOCUMENTATION, NON-CONFORMANCE, AND APPROVAL OF TESTS

A. Documentation

1. BECA must witness and document results of FPT.

B. Non-Conformance

1. BECA must record results of functional testing. Deficiency or non-conformance issues must be noted and reported to the Commissioner. The Commissioner must provide such non-conformance reports to the CxA, Design Consultant, Contractor, and other entities, as needed.

2. Corrections of minor deficiencies identified may be made during tests at the discretion of the Commissioner and as recommended by the BECA. In such cases, deficiency and resolution must be documented.

3. Every effort must be made to expedite testing and minimize unnecessary delays, while not compromising integrity of tests.

4. Deficiencies are handled in the following manner:
   a) BECA documents deficiencies and notes Contractor's response and intentions. A finding of deficiency will not end the testing process.
   b) BECA submits deficiency report to the Commissioner. The Commissioner will provide such deficiency report to the CxA, Contractor, Design Consultant, and other entities as required.
   c) Contractor corrects deficiency and certifies that material or assembly is ready to be retested.
   d) Contractor informs Commissioner of retesting schedule for coordination with the BECA.
   e) Contractor reschedules test with the Commissioner and BETA at no additional cost to the City of New York.
   f) If a test must be witnessed more than twice by the BECA due to repeated failure to perform as per the design documents, the Contractor must be responsible for the BECA's fee for witnessing repeated tests beyond the second incidence. Such fee will be negotiated between the BECA and the Commissioner.

C. Testing

1. Costs for all testing and retesting required for the Project will be the responsibility of the Contractor. The Contractor is to provide access to the test specimens to the Commissioning Team, through the Commissioner.

3.8 COMMISSIONING DOCUMENTATION

A. Final Report Details

1. Final BECx Report must include an executive summary, list of participants and roles, brief building description, overview of Commissioning and testing scope, and general description of testing and verification methods. Report must contain evaluation regarding:
   a) Conformance to Specifications and design intent.
   b) Material/system installation.
   c) Functional performance.
2. All outstanding non-compliance items must be specifically listed.
3. Recommendations for improvement to system or operations, future actions, etc. must also be listed.

END OF SECTION 01 91 15

FMS ID: **HH112FTRF**

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS
30-30 THOMSON AVENUE LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000 WEBSITE www.nyc.gov/ddc

Department of Design and Construction

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

Fort Washington Armory Roof Replacement / HVAC Upgrade

LOCATION: **216 Fort Washington Avenue**
BOROUGH: **Manhattan, NY 10032**
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: **HH112FTRF**

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

30-30 THOMSON AVENUE
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VOLUME 3 OF 3

ADDENDUM TO THE GENERAL CONDITIONS

SPECIFICATIONS

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

Fort Washington Armory Roof Replacement / HVAC Upgrade

LOCATION: **216 Fort Washington Avenue**
BOROUGH: **Manhattan, NY 10032**
CITY OF NEW YORK

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

Department of Homeless Services

Arquitectonica

Date: **June 2, 2025**

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 #: HH112FTRF

PROJECT NAME: Fort Washington Armory Roof Replacement / HVAC Upgrade

PROJECT DESCRIPTION: This Project consists of the removal of the existing low sloped roofs and replacement with a high R-value roofing system. Deteriorating brick parapets at the east, NW and SW will be rebuilt. Deteriorating terracotta parapet caps will be restored. Existing HVAC and MEP equipment, ductwork, and refrigerant and piping will be removed during construction, stored, and reinstalled with the pre-existing equipment and systems after roof replacement work. Deteriorating ductwork will be removed and replacement with new ductwork.

PROJECT LOCATION: 216 Fort Washington Avenue
BOROUGH: Manhattan
CITY OF NEW YORK
ZIP CODE: 10032
COMMUNITY BOARD #: Manhattan 12

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: *YES*
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

NOT USED

IV. PROJECT MANAGEMENT

☐ DDC will publicly bid and enter into all contracts for the Project. DDC will manage the Project using its own personnel.

☒ DDC will publicly bid and enter into all contracts for the Project. A Construction Management firm (the "CM") hired by DDC will manage the Project. The Contractor is advised that the CM will serve as the representative of the Commissioner at the site and will, subject to review by the Commissioner, be responsible for the inspection, management, coordination and administration of the required construction work, as delineated in the article of the Standard Construction Contract entitled "The Resident Engineer".

V. CONTRACTS FOR THE PROJECT

The Project consists of a single contract, the Contract for General Construction Work. The Contractor for General Construction Work is responsible for the performance of all required work for the Project as set forth in the Contract Documents (General Conditions, Drawings and Specifications), including all responsibilities and obligations assigned to separate Contractors for the following subdivisions of the work: Plumbing Work, HVAC Work, and Electrical Work. All responsibilities and obligations in the Contract Documents assigned to separate Contractors for such subdivisions of the work are the responsibility of the Contractor for General Construction Work.

VI. SCHEDULES

The Contractor is advised that Schedules A through E are attached to, and incorporated as part of, this Addendum to the General Conditions. These schedules contain important information that is specific to this Project. The Contractor is advised to carefully review these schedules.

VII. APPLICABILITY OF SECTIONS/SUB-SECTIONS AND AMENDED SUB-SECTIONS

The Contractor is advised that various Sections/Sub-Sections in the General Conditions may not apply to this Project or may apply as amended. Such Sections/Sub-Sections advise the Contractor to "Refer to the Addendum for the applicability of this Section/Sub-Section." Such Sections/Sub-Sections are set forth below. A check mark indicates whether the Section/Sub-Section (1) applies to the Project, (2) does not apply to the Project, or (3) applies to the Project as amended. If no box is checked, the Section/Sub-Section, as set forth in the General Conditions, applies to the Project. Amended Sections/Sub-Sections, if any, are set forth following this list of Sections.

Section	Sub-Section	Sub-Section	Applies		Does not Apply		Applies as Amended
01 1000	1.4 (B)	Scope and Intent / LEED			X		
	1.4(C)	Scope and Intent / Commissioning			X		
01 2100.10		Price Adjustment Allowance			X		
01 2100.20		Expanded Work Allowance	X				
01 2100.30		Project Work Acceleration Allowance			X		
01 3216.10		Project Schedules (Method A)			X		
01 3216.20		Project Schedules (Method B)	X				
01 3216.30		Project Schedules (Method C)			X		
	1.7 Q	Cost Loaded Schedule			X		
01 3233		Photographic Documentation	X				
01 3300	1.7 (A-D)	LEED Submittals			X		
01 3503		General Mechanical Requirements			X		
01 3506	3.2 (A-B)	Electrical Conduit System Including Boxes (Pull, Junction and Outlet)			X		
	3.3 (A-E)	Electrical Wiring Devices			X		
	3.4 (A-I)	Electrical Conductors and Terminations			X		
	3.5 (A-B)	Circuit Protective Devices			X		
	3.6 (A-J)	Distribution Centers			X		
	3.7 (A-I)	Motors			X		
	3.8 (A-I)	Motor Control Equipment			X		
01 3591		Historic Treatment Procedures	X				
01 5000	3.2 (A)	Temporary Water Facilities / Temporary Water			X		
	3.2 (B)	Temporary Water Facilities / Temporary Water – Work in Existing Facilities			X		
	3.3 (B)	Temporary Sanitary Facilities / Self-Contained Toilet Units			X		
	3.3 (C)	Temporary Sanitary Facilities / Existing Toilets	X				
	3.4 (B) 1	Temporary Power, Lighting, and Site Lighting / Connection to Utility Lines			X		
	3.4 (B) 2	Temporary Power, Lighting, and Site Lighting / Connection to Existing Electrical Power Service			X		
	3.4 (B) 3	Temporary Power, Lighting, and Site Lighting / Electrical Generator Power Service			X		
	3.4 (D)	Temporary Power, Lighting, and Site Lighting / Temporary Lighting			X		
	3.4 (E)	Temporary Power, Lighting, and Site Lighting / Site Security Lighting (for New Construction Only)			X		
	3.5 (A-J)	Temporary Heat			X		
	3.8 (A)	DDC Field Office / Office Space in Existing Building			X		

Section	Sub-Section	Sub-Section	Applies		Does not Apply		Applies as Amended
01 5000	3.8 (B)	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		
	3.14 (A-H)	Rodent and Insect Control			X		
	3.17(B)	Project Rendering			X		
	3.18 (A-D)	Security Guards / Fire Guards on Site			X		
01 5411	3.1 (A-J)	Temporary Use, Operation and Maintenance of Elevators During Construction for New Buildings Up To and Including 15 Stories			X		
	3.2 (A-M)	Temporary Use, Operation and Maintenance of Elevators During Construction for New Buildings Over 15 Stories			X		
	3.3 (A-E)	Temporary Use, Operation and Maintenance of Elevators During Construction for Existing Buildings			X		
01 5423	1.9 (A-C)	Sidewalk Sheds	X				
01 7300	3.3 (A-I)	Surveys			X		
	3.4 (A-B)	Borings			X		
	3.12 (A-D)	Sleeves and Hangers	X				
	3.13 (A)	Sleeve and Penetration Drawings	X				
	3.15 (A)	Location of Partitions			X		
01 7419	1.5 (C)	Waste Management Performance Requirements / LEED Certification			X		
01 7900		Demonstration and Owner's Pre-Acceptance Orientation			X		
01 8113.03		Sustainable Design Requirements for LEED v3 Buildings			X		
01 8113.04		Sustainable Design Requirements for LEED v4 Buildings			X		
01 81 13.10		Environmentally Preferable Purchasing (EPP) Compliance			X		
01 8113.13		VOC Limits for Adhesives, Sealants, Paints and Coatings for LEED v3 Buildings			X		
01 8119		Indoor Air Quality Requirements for LEED Buildings			X		
01 9113		General Commissioning Requirements for MEP Systems			X		
01 9115		General Commissioning Requirements for Building Enclosure			X		

AMENDED SECTIONS/SUB-SECTIONS

The Contractor is advised that the amended Sub-Sections set forth below are included in the General Conditions and apply to the Project.

Revise Section 01 73 00 as noted below:

3.11 TRANSPORTATION

E. Trucking: All third-party trucking hired by one of the Prime Contractors or any Tier Subcontractor must be submitted as a Request for Subcontractor Approval (RFAS) as a subcontractor with the following exceptions:
   1. For materials delivered by a supplier;
   2. For pick-up and delivery of containers and/or dumpsters not used for soils.

Revise Section 01 50 00 as noted below:

Include the following article:

1.14 BUILDING COORDINATION:

A. Regular Building System Hours:
   1. 7am – 5pm, Monday through Friday.
      a. The building is only open on weekends for certain events.
   2. All work must be performed during regular business hours, 7am - 5pm, Monday through Friday.
   3. After hours work must be requested by the Contractor a minimum of 2 days in advance for review and approval.
   4. Operation events may cause conflict with construction schedule and must be coordinated with Fort Washington Armory in advance.

B. After Hours Coordination:
   1. Contractor and all subcontractors who require access to the building outside of regular business hours are required to be on a preapproved access list; only DHS/DDC can authorize the Contractors on-site.
   2. For access, a list must be submitted 48 hours in advance to DDC and DHS authorities. Pre-approved Contractors will be required to sign in and out when accessing the building outside of normal business hours.

C. General Construction Restriction Notes
   1. Fort Washington Armory must be notified at least 72 hours in advance of any shutdown affecting occupancy of the building including the following systems:
      a. Water (hot or cold)
      b. Heating
      c. Electrical
      d. Cooling
      e. Internet/Phones
   2. Fort Washington Armory must be notified at least 72 hours in advance of any work requiring Contractor access to client dormitories and/or bathrooms.
   3. Fort Washington Armory must be notified at least 24 hours in advance of any work that might create fumes or aerosols.
   4. Fort Washington Armory staff must have easy access to fire alarm panel at all times in order to perform daily visual inspections, run fire drills, and ensure proper operation of the system.
   5. Contractor will be responsible for providing fire watch service during all shutdowns of sprinkler and/or fire alarm systems.
   6. Contractor will be responsible for ensuring that primary and secondary egress routes for all building areas are maintained in accordance with DOB and FDNY codes at all times. These routes include:

a. Stair tower containing two staircases between 1st floor and roof and 1 staircase between the 1st floor and the basement.
b. Single staircase from 1st floor to basement at the rear of the building.

7. Contractor will be responsible for dust mitigation, protection and cleaning in all areas adjacent to their active workspace and/or accessed by their workers.
8. Contractor will be responsible for safeguarding and protecting their own work, materials, tools and equipment.

VIII. SPECIAL EXPERIENCE REQUIREMENTS FOR THE PROJECT

Refer to the PASSPort Questionnaire for Special Experience Requirements.

IX. REVISIONS: SPECIFICATIONS AND CONTRACT DRAWINGS

The Specifications and the Contract Drawings for the Project are revised in accordance with the provisions set forth below.

(1) Owner: Wherever the term “Owner” is used in the Specifications and/or the Contract Drawings, such term means the City of New York.

(2) Other Entities: In the event any entity other than the City of New York is referred to or named as the “Owner” in the Specifications and/or the Contract Drawings, the name of such other entity is deemed deleted and replaced with the “City of New York”.

(3) Architect / Engineer: Wherever the words “Architect”, “Engineer”, “Architect / Engineer” or “Architect and/or Engineer” are used in the Specifications and/or the Contract Drawings, such words are deemed deleted and replaced with the word “Commissioner”.

(4) Products / Manufacturers: Wherever the Specifications and/or the Contract Drawings require the Contractor to provide a particular product (i.e., material and/or equipment) from a designated manufacturer and/or vendor, the term “or approved equal” is deemed inserted, even if only one product and/or manufacturer is specified, except as otherwise provided below.
   (a) Proprietary Items: If the Documents section in PASSPort contains a Notice which identifies a particular product from a designated manufacturer as a "Sole Source Product, the Contractor is required to provide such specified product. In such case, no substitution or “approved equal” will be permitted.

(5) Special Experience Requirements: Special Experience Requirements for the Project, if any, are set forth in the PASSPort Questionnaire. Special Experience Requirements may apply to Contractors, subcontractors, installers, fabricators, applicators, erectors, specialists, manufacturers and/or suppliers. Refer to DDC General Conditions Section 014000 Article 1.7.C for applicable Special Experience qualification levels. If the Specifications and/or the Contract Drawings contain any Special Experience Requirement that is not set forth in the PASSPort Questionnaire, such Special Experience Requirement is deemed deleted, except as otherwise provided below.
   (a) Any Special Experience Requirement that provides that the entity performing the work or supplying the material must have more than three (3) years of experience, is revised to provide that the entity performing the work or supplying the material must have three (3) years of experience as noted in DDC General Conditions Section 014000 Quality Requirements, Article 1.7.B, except as described in paragraph (b) below.
   (b) Any Special Experience Requirement that pertains to the abatement of hazardous materials is not be subject to the deletion and/or revision set forth above. Such Special Experience Requirement remains in full force and effect.
   (c) Except as set forth in the DDC General Conditions Article 1.7, any Special Experience Requirement that provides that the individual workers performing the work must be licensed, authorized, certified, approved by or acceptable to the manufacturer, is deemed deleted and replaced with the requirement that such individual workers must be properly trained for the specified work.

(6) Alternate Bids: If the agency is requesting the submission of Alternate Bids, a Notice regarding such Alternate Bids is set forth in the Documents section in PASSPort. In the event of any conflict or inconsistency between (1) the Notice regarding Alternate Bids set forth in the Documents section in PASSPort and (2) a provision in the Specifications and/or the Contract Drawings regarding Alternate Bids, the Notice set forth in the Documents section in PASSPort will prevail. If the agency is not requesting the submission of Alternate Bids, as indicated by the absence of a Notice in the Documents section in PASSPort, and the Specifications and/or the Contract Drawings contain any provision regarding Alternate Bids, such provision is deemed deleted.

(7) Contractor Retained Engineer: If the Specifications and/or the Contract Drawings require the Contractor to retain an Engineer to provide engineering services for the Project, the following sentence is deemed inserted: “Such Engineer must be a Professional Engineer, licensed in the State of New York.”

(8) LEED Related Provisions: If the Specifications and/or the Contract Drawings require the Contractor to purchase FSC certified wood, rapidly renewable materials, or materials within 500 miles (LEED v3) or 100 miles (LEED v4), such provisions are deemed deleted and replaced with the requirement that if the Contractor has purchased

FSC certified wood, rapidly renewable materials, or materials within 500 miles (LEED v3) or 100 miles (LEED v4), the Contractor must submit such forms or documentation as may be required by the City in order for the USGBC to certify that the Project qualifies for the related LEED credit(s).

(9) Guarantees: Requirements for Guarantees and Maintenance are set forth in Schedule B, which is included in the Addendum to the General Conditions. In the event of any conflict or inconsistency between (1) a guarantee and/or maintenance requirement set forth in the Specifications and/or the Contract Drawings and (2) a guarantee and/or maintenance requirement set forth in Schedule B, the guarantee and/or maintenance requirement set forth in Schedule B will prevail.

(10) Warranties: Requirements for Warranties are set forth in Schedule B, which is included in the Addendum to the General Conditions.
- (a) The term "manufacturer's warranty" as described in this article encompasses the following terms as indicated in the Specifications: "Manufacturer's Warranty", "Manufacturer's Special Warranty", "Special Warranty", "Special Finish Warranty", "Manufacturer's Special Warranty for a (product, assembly)."
- (b) In the event of any conflict or inconsistency between (1) a warranty requirement set forth in the Specifications and/or the Contract Drawings and (2) a warranty requirement set forth in Schedule B, the warranty requirement set forth in Schedule B will prevail.
- (c) In the event a warranty requirement set forth in the Specifications and/or the Contract Drawings is omitted from Schedule B, such omission from Schedule B has no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications and/or the Contract Drawings, will remain in full force and effect.
- (d) In the event a warranty requirement for a particular item of material or equipment is omitted from Schedule B, as well as from the Specifications or the Contract Drawings, and the manufacturer of such item actually provides a warranty, the Contractor is obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by that manufacturer.

(11) Exculpatory Provisions: In the event the Specifications and/or the Contract Drawings contain any provision whereby the consultant and/or any of its officers, employees or agents, including subconsultants, is absolved of responsibility for any act or omission, such provision is deemed deleted.

(12) Insurance: Provisions regarding insurance coverage the Contractor is required to provide are set forth in Article 22 of the City of New York Standard Construction Contract and Schedule A, which is included in the Addendum to the General Conditions. In the event the Specifications and/or the Contract Drawings contain any provision regarding insurance requirements, such provision is deemed deleted.

(13) Indemnification: Provisions regarding indemnification are set forth in Articles 7, 12, 22 and 57 of the City of New York Standard Construction Contract and, if applicable, in the Indemnification Agreement in the Appendix. In the event the Specifications and/or the Contract Drawings contain any provision regarding indemnification, such provision is deemed deleted.

(14) Dispute Resolution: Provisions regarding dispute resolution are set forth in Article 27 of the City of New York Standard Construction Contract. In the event the Specifications and/or the Contract Drawings contain any provision regarding dispute resolution, such provision is deemed deleted.

(15) Payment to Other Entities: In the event the Specifications and/or the Contract Drawings contain any provision which requires the Contractor to make payments to an entity other than a subcontractor and/or supplier providing services and/or material for the project, such provision is deemed deleted.

(16) General Conditions: In the event of any conflict or inconsistency between (1) the Specifications and/or the Contract Drawings and (2) the General Conditions, the General Conditions will prevail.

(17) Standard Construction Contract: In the event of any conflict or inconsistency between (1) the Specifications and/or the Contract Drawings and (2) the City of New York Standard Construction Contract, the City of New York Standard Construction Contract will prevail.

(18) Shall: Wherever the word "shall" is used in the Specifications and/or the Contract Drawings with respect to the Contractor's or Subcontractor's responsibilities or Project Requirements, the term is intended to convey a contractual mandate, such as the terms "must," "will," or "be obliged to" (and not "may").

SCHEDULE A (FOR PUBLICLY BID PROJECTS)
PART I – Contract Requirements

Various Articles of the Contract refer to requirements which are set forth in Schedule A of the General Conditions. The Schedule set forth below specifies the following: (1) the referenced Articles of the Contract, and (2) the specific requirements applicable to the contract.

REFERENCE	ITEM	REQUIREMENTS	CONTRACT #1	
Information For Bidders	Bid Security	The Contractor must obtain a bid security in the amount indicated to the right.	Required provided the TOTAL BID PRICE set forth on the Bid Form is $1,000,000. Or more. Certified Check: 2% of Bid Amount or Bond: 10% of Bid Amount	
Information For Bidders	Performance and Payment Bonds		For Contracts in the amount of $1,000,000.00 or more, Performance and Payment Bonds must each be in amount equal to 100% of the Contract Price.	
Information For Bidders	Department of Design and Construction Safety Requirements	The Contractor must provide the safety personnel as indicated to the right	■ Project Safety Representative □ Dedicated, full-time Project Safety Representative	
Article 14 Contract	Time of Substantial Completion	Consecutive Calendar Days	**720 CCDs**	
Article 15 Contract	Liquidated Damages	For each consecutive calendar day over completion time	**$600**	
Article 17 Contract	Sub-Contracts	Not to exceed Percent of Contract Price	**60%**	
Article 21 Contract	Retainage	Percent of Voucher	If 100% bonds are required	**5%**
			If 100% bonds are not required, and Contract Price is $1,000,000 or less	**5%**
			If 100% bonds are not required, and Contract Price is more than $1,000,000	**10%**
Article 24 Contract	Deposit Guarantee	Percent of Contract Price	**1%**	
Article 24 Contract	Period of Guarantee		See Schedule B of the Addendum to the General Conditions	
Article 75 Contract	Compensation to be Paid to Contractor		Amount for which the Contract was Awarded: _____ _____ Dollars ($_____)	
Article 79 Contract	MWBE Program		See M/WBE Utilization Plan in the PASSPort Procurement M/WBE Considerations Section.	

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 – Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions

Note: All certificate(s) of insurance submitted pursuant to Contract Article 22.3. 3 must be accompanied by a Certification by Broker consistent with Part III below and include the following information:

- **For each insurance policy, the name and NAIC number of issuing company, number of policy, and effective dates;**
- **Policy limits consistent with the requirements listed below;**
- **Additional insureds or loss payees consistent with the requirements listed below; and**
- **The number assigned to the Contract by the City (in the "Description of Operations" field).**

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
■ Commercial General Liability Art. 22.1.1	This Contract requires Commercial General Liability Insurance (CGL) that is at least as broad as ISO Form CG 00 01 (see Section 22.1.1 of the New York City Standard Construction Contract). The minimum limits shall be $1,000,000.00 per occurrence and $2,000,000.00 per project aggregate applicable to this Contract unless the Work requires a permit from the Department of Buildings and greater limits of Commercial General Liability Insurances are required pursuant to 1 RCNY section 101-08. Additional Insureds: 1. City of New York, including its officials and employees, with coverage at least as broad as ISO Forms CG 20 10 and CG 20 37, and 2. All person(s) or organization(s), if any, that Article 22.1.1(b) of the **Contract** requires to be named as Additional Insured(s), with coverage at least as broad as ISO Form CG 20 26. The Additional Insured endorsement shall either specify the entity's name, if known, or the entity's title (e.g., Project Manager). 3. Fort Washington Armory Foundation

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
■ Workers' Compensation Art. 22.1.2 ■ Disability Benefits Insurance Art. 22.1.2 ■ Employers' Liability Art. 22.1.2 □ Jones Act Art. 22.1.3 □ U.S. Longshoremen's and Harbor Workers Compensation Act Art. 22.1.3	Workers' Compensation, Employers' Liability, and Disability Benefits Insurance: Statutory per New York State law without regard to jurisdiction. **Note**: The following forms are acceptable: (1) New York State Workers' Compensation Board Form No. C-105.2, (2) State Insurance Fund Form No. U-26.3, (3) New York State Workers' Compensation Board Form No. DB-120.1 and (3) Request for WC/DB Exemption Form No. CE-200. The City will not accept an ACORD form as proof of Workers' Compensation or Disability Insurance. Jones Act and U.S. Longshoremen's and Harbor Workers' Compensation Act: Statutory per U.S. law.
■ Builders' Risk Art. 22.1.4	100 % of total value of **Work** **Contractor** the Named Insured; the **City** both an Additional Insured and one of the loss payees as its interests may appear. Installation Floater not permitted. Note: Builders Risk Insurance may terminate upon **Substantial Completion** of the **Work** in its entirety.
■ Commercial Auto Liability Art. 22.1.5	$1,000,000.00 per accident combined single limit If vehicles are used for transporting hazardous materials, the **Contractor** shall provide pollution liability broadened coverage for covered vehicles (endorsement CA 99 48) as well as proof of MCS 90

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
□ Contractor's Pollution Liability Art. 22.1.6	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
□ Marine Protection and Indemnity Art. 22.1.7(a)	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
□ Hull and Machinery Insurance Art. 22.1.7(b)	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
□ Marine Pollution Liability Art. 22.1.7(c)	$_____ each occurrence Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER] Art. 22.1.8 □ Ship Repairers Legal Liability	$_____ each occurrence

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions (Continued)

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
[OTHER] Art. 22.1.8 □ Collision Liability/Towers Liability	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER] Art. 22.1.8 □ Railroad Protective Liability _____	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER] Art. 22.1.8 ■ Asbestos Liability _____	Only required of the Contractor or Subcontractor performing any required asbestos removal. $1,000,000 each occurrence, $2,000,000 aggregate (Combined Single Limit); only required of the Contractor or Subcontractor performing any required asbestos removal. Additional Insureds: 1. City of New York, including its officials and employees, and 2. Fort Washington Armory Foundation

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions (Continued)

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

[OTHER] Art. 22.1.8 □ Boiler Insurance_____	 $200,000
[OTHER] Art. 22.1.8 ■ Professional Liability In the event any section of the Specifications requires the Contractor to engage a Professional Engineer to provide design and/or engineering services, the Engineer engaged by the Contractor, as well as any sub consultant(s) performing professional services, shall provide Professional Liability Insurance.	$1,000,000 per occurrence The Contractor's Professional Engineer shall maintain and submit evidence of Professional Liability Insurance in the minimum amount of $1,000,000 per claim. The policy or policies shall include an endorsement to cover the liability assumed by the Contractor under this Agreement arising out of the negligent performance of professional services or caused by an error, omission or negligent act of the Contractor's Professional Engineer or anyone employed by the Contractor's Professional Engineer. Claims-made policies will be accepted for Professional Liability Insurance. All such policies shall have an extended reporting period option or automatic coverage of not less than two (2) years. If available as an option, the Contractor's Professional Engineer shall purchase extended reporting period coverage effective on cancellation or termination of such insurance unless a new policy is secured with a retroactive date, including at least the last policy year.
OTHER] Art. 22.1.8 □ Umbrella/Excess Liability Insurance The Contractor shall provide Umbrella/Excess Liability Insurance in the minimum amounts shown to the right. The policy terms and condition should be at least as broad as the underlying policies. The underlying policies should comply with the insurance provision as outlined by the contract. Defense cost should be in addition to the limit of liability. The City of New York, including its officials and employees, should be included as additional insured as respects to the noted project.	$10,000,000 per Occurrence and $10,000,000 in Aggregate

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART III. Certificates of Insurance

All certificates of insurance (except certificates of insurance solely evidencing Workers' Compensation Insurance, Employer's Liability Insurance, and/or Disability Benefits Insurance) must be accompanied by one of the following:

(1) the Certification by Insurance Broker or Agent on the following page setting forth the required information and signatures;

-- OR --

(2) copies of all policies as certified by an authorized representative of the issuing insurance carrier that are referenced in such certificate of insurance. If any policy is not available at the time of submission, certified binders may be submitted until such time as the policy is available, at which time a certified copy of the policy shall be submitted.

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART III. Certification by Insurance Broker or Agent

The undersigned insurance broker or agent represents to the City of New York that the attached Certificate of Insurance is accurate in all material respects.

_____

[Name of broker or agent (typewritten)]

_____

[Address of broker or agent (typewritten)]

_____

[Email address of broker or agent (typewritten)]

_____

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

_____

[Signature of authorized official or broker or agent]

_____

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

State of ……...)
) ss:
County of ……)

Sworn to before me this

_____ day of _____, 20__

_____

NOTARY PUBLIC FOR THE STATE OF_____

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART IV. Address of Commissioner

Wherever reference is made in Article 7 or Article 22 to documents to be sent to the **Commissioner** (e.g., notices, filings, or submissions), such documents must be sent via email to insurance@ddc.nyc.gov. Hard copies of such documents will no longer be required or accepted.

SCHEDULE B

Guarantees and Warranties

(Reference: Section 01 7839, Article 2.7 of the DDC Standard General Conditions)

GUARANTY FROM CONTRACTOR

(1) Contractor's Guaranty Obligation: The Contractor must promptly repair, replace, restore or rebuild, as the Commissioner may determine, any finished Work in which defects of materials or workmanship may appear or to which damage may occur because of such defects, during the one (1) year period subsequent to the date of Substantial Completion (or use and occupancy in accordance with the Contract), except for the areas of Work set forth below:

- Roofing, Waterproofing, and Joint Sealant Work. For these types of work, the guarantee period will be (2) two years.

- Trees and/or Plant Material. For trees and/or plant material furnished and installed, the guarantee period will be (2) two years. During the guarantee period, the Contractor must provide all maintenance services set forth in the Specifications.

(2) Guaranty Period: The obligation of the Contractor, and its Surety under the Performance Bond, is limited to the period(s) of time specified above.

(3) Other Provisions Deemed Deleted: In the event the Specifications and/or the Contract Drawings contain any provisions regarding guaranty requirements, such provisions are deemed deleted and replaced with the guaranty requirements set forth in this Schedule B.

****

WARRANTY FROM MANUFACTURER

(1) Contractor's Obligation to Provide Warranties: The items of material and/or equipment for which manufacturer warranties are required are listed below. For each item of material and/or equipment listed below, the Contractor must obtain a written warranty from the manufacturer. Such warranty must provide that the material or equipment is free from defects for the period set forth below and will be replaced or repaired within such specified period. The Contractor must deliver all required warranties to the Commissioner.

(2) Required Warranties:

Specification Number	Material or Equipment	Warranty Period
04 21 29	Terra Cotta Masonry	5 Years
07 52 00	Modified Bituminous Membrane Roofing	20 Years
07 62 00	Tin/Zinc Coated Architectural Copper	25 Years
07 72 33	Roof Hatches	5 Years
09 29 00	Gypsum Board	2 Years
22 05 29	Pipe Hangers and Supports	5 Years
22 07 19	Plumbing Piping Insulation	1 Year
22 14 13	Storm Water Drainage System	1 Year
22 14 26	Roof Drains	5 Years
26 28 16	Enclosed Switches and Circuit Breakers	1 Year

(3) Application: The obligations under the warranty for the periods specified above apply only to the manufacturer of the material or equipment, and not to the Contractor or its Surety; provided, however, the Contractor retains responsibility for obtaining all required warranties from the manufacturers and delivering the same to the Commissioner.

(4) Other Provisions: The warranty requirements set forth in this Schedule B are also included in the Specifications.

(a) In the event of any conflict between a warranty requirement set forth in the Specifications and a warranty requirement set forth in Schedule B, the warranty requirement set forth in Schedule B will take precedence.

(b) In the event a warranty requirement set forth in the Specifications is omitted from Schedule B, such omission from Schedule B will have no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications, will remain in full force and effect.

(c) In the event a warranty requirement for a particular item of material or equipment is omitted from both Schedule B and the Specifications, and the manufacturer of such item actually provides a warranty, the Contractor is obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by that manufacturer.

(d) In the event a warranty requirement is provided for a particular item of material or equipment, and such requirement specifies a warranty period that is longer than that which is actually provided by any of the specified manufacturers, the Contractor is obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by any of the specified manufacturers, unless otherwise directed in writing by the Commissioner.

(e) Unless indicated otherwise, Warranties are to take effect on the date of Substantial Completion.

SCHEDULE C

Contract Drawings

(Reference: Section 01 1000, Article 1.5 (A) of the DDC Standard General Conditions)

The Schedule set forth below lists all Contract Drawings for the Project.

GENERAL

G-000	Cover Sheet
G-001	Drawing List/Team Members/Site Information
G-002	General Notes

ZONING & EGRESS

Z-001	Zoning Map and Plot Plan

DEMOLITION

DM-001	General Demolition Notes
DM-100	Roof Partial Demolition Plan - West
DM-101	Roof Partial Demolition Plan - East
DM-102	Roof Demolition Plan

ARCHITECTURAL

A-001	Roof Diagram and Photographs
A-002	Partial Roof Plan- West 1 of 2
A-003	Partial Roof Plan- East 2 of 2
A-004	Fourth Floor Plan
A-005	Roof Railing Plan
A-301	Fourth Floor RCP
A-401	Exterior Elevations - East and West
A-402	Exterior Elevations - North
A-403	Exterior Elevations - South Façade/Parapet Restoration/Rising Wall
A-404	Exterior Elevations - North Parapet
A-405	Exterior Detailed Elevations – West Roof
A-406	Exterior Elevations – West Parapet Terracotta Plan
A-501	Roof Details
A-502	Roof Details
A-503	Roof Details
A-504	Roof Details
A-505	Roof Details

STRUCTURAL

T-001.00	Title Sheet

S-001.00	General Notes
S-002.00	Legend
S-100.00	Roof Partial Plan West
S-101.00	Roof Partial Plan East
S-102.00	Dunnage Framing Modification Plan
S-200.00	South-West Elevation
S-201.00	North Elevation
S-202.00	West and East Elevations
S-300.00	Sections and Details
S-301.00	Sections and Details
S-302.00	Sections and Details

MECHANICAL/ELECTRICAL/PLUMBING/FIRE ALARM

EN-001	Mechanical Energy Compliance
M-001	Mechanical Symbols, Notes & Abbreviations
M-011	West Roof Demolition Plan
M-012	East Roof Demolition Plan
M-101	West Roof Mechanical Plan
M-102	East Roof Mechanical Plan
M-501	Mechanical Details (1 of 3)
M-502	Mechanical Details (2 of 3)
M-503	Mechanical Details (3 of 3)
M-701	Mechanical Schedules
E-001	Electrical Symbols, Notes and Abbreviations
E-010	4th Floor Electrical Plan Demolition
E-011	Roof Electrical Plan Demolition
E-100	4th Floor Electrical Plan
E-101	Roof Electrical Plan
FA-011	Roof Fire Alarm Plan Demolition
FA-101	Roof Fire Alarm Plan
P-001	Plumbing Symbols List, Abbreviations, Notes and Drawing List
P-100	4th Floor Plumbing Plan
P-101	Roof Plumbing Plan
P-501	Plumbing Details and Risers Diagram
H-001	Asbestos Abatement General Notes
H-002	Asbestos Abatement Roof B and C Plan
H-003	Asbestos Abatement Roof E and F Plan
H-004	Asbestos Abatement Roof D, G and H
H-005	Asbestos Abatement Partial 4th Floor Plan

SCHEDULE D

Electrical Motor Control Equipment

(Reference: 01 3506, Article 3.8 of the DDC Standard General Conditions)

NO TEXT

SCHEDULE E

Separation of Trades

NOT USED FOR SINGLE CONTRACTS

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02 80 13 General Contractor Work Allowance for Incidental Asbestos Abatement
02 82 13 Asbestos Abatement

DIVISION 3- CONCRETE
03 30 00 Cast In Place Concrete

DIVISION 4 - MASONRY
04 01 20.91 Unit Masonry Restoration
04 03 21.21 Terra Cotta Conservation Treatment
04 21 16 Ceramic Glazed Clay Masonry
04 21 29 Terra Cotta Masonry

DIVISION 5 - METALS
05 12 00 Structural Steel Framing
05 31 00 Steel Decking
05 50 00 Metal Fabrications

DIVISION 6 – WOOD, PLASTIC AND COMPOSITES
06 10 00 Rough Carpentry

DIVISION 7 -THERMAL AND MOISTURE PROTECTION
07 52 00 Modified Bituminous Membrane Roofing
07 62 00 Sheet Metal Flashing and Trim
07 72 33 Roof Hatches
07 84 13 Penetration Firestopping
07 92 00 Joint Sealants

DIVISION 9 – FINISHES
09 01 20.91 Plaster Restoration
09 23 00 Gypsum Plastering
09 29 00 Gypsum Board
09 91 00 Painting

DIVISION 22 – PLUMBING
22 00 00 Plumbing
22 05 00 Common Work Results for Plumbing
22 05 29 Hangers and Supports for Plumbing Piping and Equipment
22 07 19 Plumbing Piping Insulation

DIVISION 22 – PLUMBING (Continued)
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23 05 00 Common Work results for HVAC
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23 05 23 General-Duty Valves for HVAC Piping
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23 09 00 Instrumentation and Control For HVAC
23 21 13 Hydronic Piping
23 21 16 Hydronic Piping Specialties
23 23 00 Refrigerant Piping
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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 44 Sleeves and Sleeve Seals for Electrical Raceways and Cabling
26 05 53 Identification for Electrical Systems
26 27 26 Wiring Devices
26 28 13 Fuses
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DIVISION 28 – FIRE ALARM
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CONTRACT # 1

GENERAL CONSTRUCTION WORK

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. Definitions of the areas where selective demolition will be performed.
   2. Performance Requirements.
   3. Submittal Procedures.
   4. Project Conditions.
   5. Quality Assurance of contractor for demolition and disposal of material.
   6. Execution.

B. Related Sections
   1. Section 04 01 20.91 “Unit Masonry Restoration”.
   2. Section 04 03 21.21 “Terra Cotta Conservation Treatment”
   3. Section 07 62 00 “Sheet Metal Flashing and Trim”

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Existing to Remain: 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.

C. Salvaged: Existing items to be removed from the building without damage and stored for future use by the Department of Homeless Services and/or the Fort Washington Armory.

1.4 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the City of New York’s property, demolished materials will become Contractor's property and will be removed from Project site.

1.5 PERFORMANCE REQUIREMENTS

A. Protection for Elements and Materials to Be Removed and Salvaged: Such protection will comply with the following requirements:

1. Prevent damage and deterioration from abrasion, impact, water or humidity intrusion, forces caused by handling and transportation, and other exterior forces.
2. Prevent soiling, staining, or marking. Allow application and removal without damaging, deteriorating, or altering existing surfaces and finishes.
3. Allow application and removal without damaging, deteriorating, or altering existing surfaces and finishes.
4. Provide optimum support to all portions of all elements to prevent cracking, breakage, chipping, and application of undue stress during removal, handling, packing, transportation, and storage.

B. Protection for Elements and Materials to Remain in Place: Use all measures necessary to completely protect in-place elements, materials, and finishes, to remain, including building elements and architectural details, from damage and from deterioration that might result from work of this Section—including, but not limited to, dust, dirt, vibration, water, water vapor, condensation, chemicals, chemical vapors, impact, abrasion, excessive stress, light and ultraviolet rays, temperature extremes, repeated temperature variations, and changes in humidity—without damaging, deteriorating, or otherwise adversely affecting the elements being protected during preparation, application of protection, duration of protection, and removal of protection. All work required to achieve this intent will be included as work of this Section.

C. Removal: Removal of elements and materials to be removed and salvaged must be accomplished without damaging, deteriorating, or altering elements and materials to be removed and without damaging, deteriorating, or altering elements, materials, and finishes to remain in place.

D. Storage: Storage will comply with the following conditions:

1. Provide security from theft, loss, vandalism, damage, and deterioration.
2. Prevent exposure to abrasion, impact, water (precipitation, condensation, and high humidity), excessive heat and cold, substances that might cause soiling or staining, and other deleterious forces.
3. Prevent damage and deterioration caused by animals, insects, mold, and other organisms.
4. Provide for inspection of elements and materials at Commissioner’s request.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.7 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
2. Interruption of discovered utility services.
3. Coordination of shutoff, capping, and continuation of utility services.
4. Locations of and continuous maintenance of two emergency means of egress.

B. Pre-demolition Photographs or Video Recording: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

C. Selective Demolition, Removal and Salvage Program: Detailed description of methods and procedures, equipment, tools, and materials proposed for use in removal and salvage operations for each element and material to be removed and salvaged, including, but not limited to, the following:
1. Procedures for controlling noise and dust.
2. Releasing or freeing materials and elements from existing construction.
3. Protection for elements to remain.
4. Handling and transporting materials and elements removed.
5. Packaging elements removed and salvaged.
6. Storage locations.

1.8 PREDEMOLITION COORDINATION

A. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

1. Conditions existing at time of inspection will be maintained by the City of New York as far as practical.

B. Hazardous Materials: Hazardous materials may be encountered in the Work per Sections 028013 and 028213.

1. If materials suspected of containing hazardous materials are encountered, stop work, do not disturb; immediately notify the Commissioner.

C. Storage or sale of removed items or materials on-site will not be permitted.

D. Utility Service: Maintain existing utilities indicated or required by the Commissioner to remain in service and protect them against damage during selective demolition operations.

E. Protection of Building and Property: Provide all necessary protection and procedures to protect adjacent elements and materials from damage and from deterioration during work of this Section.

1. Protection from Rain and Other Precipitation:

a. Protect building elements and finishes from damage and from deterioration caused by precipitation and other weather-related causes resulting from work of this Section.

2. Protection from Fire: Take all necessary precautions to prevent fire and spread of fire.

3. Protection from Water and Other Products Used in the Work: Provide all necessary protection to prevent damage and deterioration of building elements and materials to remain caused or resulting from products and procedures used in executing work of this Section.
4. Protection from Dust: Take all precautions necessary to keep dust resulting from the work of this Section at an absolute minimum.

F. Debris Removal

1. Remove debris using suitable containers and conveyances.
2. Keep premises clean by removing accumulation of waste materials, rubbish, and debris from site daily.

G. Security: Secure materials and elements to remain in place and materials and elements to be removed and salvaged from theft, defacement, damage, and deterioration.

H. Discrepancies: Notify the Commissioner of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

I. Disposal: Dispose of all items not to be salvaged and reinstalled or salvaged and turned over to the City of New York offsite in a legal manner. Storage or sale of removed items or materials onsite is not permitted.

1.9 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Regulatory Requirements: Comply with New York City Building Code Regulations before beginning selective demolition. Comply with hauling and disposal regulations of City of New York Department of Buildings.

C. Referenced Standards: Comply with all applicable requirements and recommendations of the latest editions of the referenced standards listed herein, except as modified by more stringent requirements of the Contract Documents and of NYC Building Code. Provide a reference copy of each of the following standards at the Project site during all periods when work of this Section is being performed. In each case in which there is a conflict between requirements of referenced and requirements of this Section, the most stringent or restrictive requirement will govern:

1. American National Standards Institute (ANSI) A10.6 – Safety Requirements for Demolition Operations.
2. National Fire Protection Association (NFPA) 241 – Safeguarding Building Construction and Demolition Operations

D. Pre-demolition Conference:

1. Inspect and discuss condition of construction to be selectively demolished. Review existing slate tile roof to remain.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

E. Special Experience Qualification:

1. Historic Treatment Specialist Qualifications: A masonry repointing specialist meeting the requirements of DDC General Conditions Section 014000 1.7/C/6.

F. Responsibility for Damage to Historic Material Resulting from Selective Removals and Salvage Work:

1. Restore and/or replace in kind all building elements, materials, and finishes (including the elements, materials, and finishes to be removed and salvaged and the elements, materials, and finishes to remain) damaged or deteriorated as a result of work of this Section.

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. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work, if any.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the Work, if any.

3.3 PREPARATION

A. Existing Utility Information: Furnish information to local utility 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. Coordinate with Con Ed (electrical utilities).

B. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to the Commissioner. Include detailed description of problem encountered.

3.4 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements of New York City Department of Buildings strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold materials more than 7 days during normal weather or three days if the temperature is expected to rise above 80 deg. F.

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally.

B. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

C. Exposed surfaces: Clean exposed surfaces and protect as necessary and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

D. Cutting and Patching: Clean areas and spaces where cleaning and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

E. Waste Disposal: Buring or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

F. During handling and installation, clean the construction material being installed, and clean adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

G. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

H. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION 02 41 19

SECTION 02 80 13 – GENERAL CONTRACTOR WORK
NOVEMBER 2017 VERSION

ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT

1.01 SCOPE FOR ASBESTOS ABATEMENT WORK

A. The "General Conditions" apply to the work of this Section.

B. The asbestos abatement contractor shall remove asbestos containing materials as needed to perform the other work of this Contract when discovered during the course of work. When required, the asbestos abatement contractor shall replace the ACM with non-asbestos containing materials. An allowance of **$15,000.00** for the **General Contractor** is herein established for this incidental work when so ordered and authorized by the Commissioner.

C. All work shall be done in accordance with the applicable provisions of the rules and regulations of the asbestos control program as promulgated by Title 15 Chapter I of RCNY and New York State Department of Labor Industrial Code Rule 56 cited as 12 NYCRR Part 56, whichever is more stringent as per latest amendments to these laws and as modified herein by these specifications.

D. All disposal of asbestos contaminated material shall be per Local Law 70/85.

E. The asbestos abatement contractor's attention is directed to the fact that certain methods of asbestos abatement are protected by patents. To date, patents have been issued with respect to "negative pressure enclosure" or “negative-air” or "reduced pressure” and "glove bag".

F. The asbestos abatement contractor shall be solely responsible for and shall hold the Department of Design and Construction and the City harmless from any and all damages, losses and expenses resulting from any infringement by the asbestos abatement contractor of any patent, including but not limited to the patents described above, used by the asbestos abatement contractor during performance of this agreement.

G. "Asbestos" shall mean any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cumingtonite-grunerite), crocidolite (riebeckite), tremolite, anthrophyllite and actinolite.

H. Prior to starting, the asbestos abatement contractor must notify the Commissioner of the Department of Design and Construction if he/she anticipates any difficulty in performing the Work as required by these Specifications. The asbestos abatement

contractor is responsible to prepare and submit all filings, notifications, etc. required by all City, State and Federal regulatory agencies having jurisdiction.

The asbestos abatement contractor is responsible for submitting the Asbestos Project Notification Form (ACP-7 Form) to the Department of Environmental Protection, Asbestos Control Program, as per Title 15, Chapter I of RCNY and to the NYSDOL as per Industrial Code Rule 56.

The asbestos abatement contractor is responsible for preparing, and submitting Asbestos Variance Application (ACP-9). If a Variance is required, the asbestos abatement contractor is responsible to retain a NYSDOL Asbestos Project Designer, as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required variance.

The general contractor is responsible for preparing and submitting an Asbestos Abatement Permit and/or Work Place Safety Plans (WPSP) that may be required for the completion of the Contract or incidental work. If such plans are required, the general contractor is responsible for retaining a registered design professional as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required plans.

The asbestos abatement contractor is responsible for the submission of all required documents to the NYCDEP to acquire the appropriate Asbestos Project Conditional Closeout (ACP-20) and/or Asbestos Project Completion Forms (ACP-21) on a timely basis for the completion of the incidental work encountered under this contract.

The asbestos abatement contractor will be required to attend an on-site job meeting with the Construction Project Manager prior to the start of work to examine conditions and plan the sequence of operations, etc.

The asbestos abatement contractor shall have a NYSDOL/NYCDEP Asbestos Supervisor onsite to oversee the work and conduct a final visual inspection as required by both Title 15, Chapter 1 of the RCNY and NYSDOL Industrial Code Rule 56.

I. All work shall be done during regular working hours unless the asbestos abatement contractor requests authorization to work in other then regular working hours and such authorization is granted by the Commissioner. (Regular work hours are those hours during which any given facility, in which work is to be done, is customarily open and functioning, normally between the hours of 8:00 A.M. and 4:00 P.M. Monday - Friday.) If such work schedule is authorized by the Commissioner, the work shall be done at no additional cost to the City.

J. The Commissioner may order that work be done in other than regular working hours as herein by defined and this order may require the asbestos abatement contractor to pay premium or overtime wages to complete the work. If the

Commissioner orders work in other than regular working hours, the asbestos abatement contractor shall multiply the unit price for that portion of the work requiring premium wages by 1.50 when computing payment in accordance with Paragraph 1.09. All requests for premium payment must be supported by certified payroll sheets and field sheets approved by the Construction Project Manager.

1.02 QUALIFICATIONS OF ASBESTOS ABATEMENT CONTRACTOR

A. Requirements: The asbestos abatement contractor must be approved through the Department's Request for Subcontractor Approval, administered by the Agency Chief Contracting Office (ACCO), Vendor Integrity Unit. The asbestos abatement contractor must demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (6) below. Such documentation shall include without limitation, all required licenses, certificates, and documentation.

1. The asbestos abatement contractor must, whether an individual, corporation, partnership, joint venture or other legal entity, demonstrate for the three year period prior to the work that it has been licensed by the New York State Department of Labor (NYSDOL), as an "Asbestos Abatement Contractor". The asbestos abatement contractor shall submit copies of the asbestos abatement contractors NYSDOL License for the past three years

2. The asbestos abatement contractor must, for the three-year period prior to the work, have been in the business of providing asbestos abatement services as a routine part of its daily operations.

3. The asbestos abatement contractor proposing to do asbestos abatement work must be thoroughly experienced in such work and must submit a list of five (5) asbestos abatement projects of similar size and complexity. The aggregate cost of these projects must be at least $1,000,000 in each of the three years.

4. For each project submitted to meet the experience requirements set forth above, the asbestos abatement contractor must submit the following information for the project; name and location of the project; name title and telephone number and email address of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work; brief description of the scope of work completed as a prime or sub-asbestos abatement contractor; amount of contract or subcontract and the date of completion.

5. The asbestos abatement contractor must demonstrate that it has the financial resources, certified supervisory personnel and equipment necessary to carry out the work and to comply with the required performance schedule, taking into consideration other business commitments. The asbestos abatement contractor must submit such documentation as may be required by the

Department of Design and Construction to demonstrate that it has the requisite capacity to perform the required services of this contract. The Department may also conduct an inspection of the asbestos abatement contractor's facility to verify if the contractor has equipment and staffing to perform the work.

6. The asbestos abatement contractor must submit a copy of their Corporate Health and Safety Plan for review and acceptance. A Job Hazard Analysis (JHA) for the specific work conducted must be included.

B. Throughout the specifications, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics thereof. Provide materials or workmanship that meet or exceed the specifically named codes or standards where required by these specifications.

C. Site Investigation: Asbestos abatement contractor shall inspect all the specifications and related drawings, and will investigate and confirm the site conditions affecting the work, including, but not limited to (1) through (5) below.
The asbestos abatement contractor will attend a walkthrough site inspection with the department's Project Manager and the Third-Party Air Monitor prior to the work. Such walkthrough will be scheduled at the Department's convenience.

1. Physical considerations and conditions of both the material and structure. These considerations include any obstacles or obstructions encountered in accessing or removing the material.

2. Handling, storage, transportation and disposal of the material.

3. Availability of qualified and skilled labor.

4. Availability of utilities.

5. Exact quantities of all materials to be disturbed and/or removed

1.03 ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITIES

The asbestos abatement contractor will visit the subject location within one (1) working day of notification to ascertain actual work required. If the project is identified as being "urgent", then work shall commence no later than 48 hours from the time of notification. In this event, the asbestos abatement contractor shall immediately notify when applicable EPA NESHAPS Coordinator, NYSDOL Asbestos Control Bureau and NYCDEP Asbestos Control Program of start of the work and file the necessary Asbestos Notifications and any applicable Variance Applications with the regulatory agencies cited above.

In the event that the project is not classified as "urgent" the asbestos abatement contractor shall notify the EPA NESHAPS Coordinator, NYSDOL and NYCDEP by submitting the requisite asbestos project notification forms, postmarked 10 days before activity begins if 260 linear feet or more and/or 160 square feet or more of asbestos containing material will be disturbed.

The following information must be included in the notification:

A. Name and address of building City or operator;

B. Project description:

1. Size - square feet, number of linear feet, etc;

2. Age - date of construction and renovations (if known);

3. Use - i.e., office, school, industrial, etc.

4. Scope - repair, demolition, cleaning, etc.

C. Amount of asbestos involved in work and an explanation of techniques used to determine the amount;

D. Building location/address, including Block and Lot numbers;

E. Work schedule including the starting and completion dates;

F. Abatement methods to be employed;

G. Procedures for removal of asbestos-containing material;

H. Name, title and authority of governmental representative sponsoring project.

1.04 WORK INCLUDED IN UNIT PRICE

The asbestos abatement contractor will be paid a basic unit price of **$25.00** per square feet for the removal and disposal of asbestos containing material and replacement of the same with non-asbestos containing materials.

Unit price shall include all costs necessary to do the work of this Contract, including but not limited to: labor, materials, equipment, utilities, disposal, insurance, overhead and profit.

1.05 AIR MONITORING – ASBESTOS ABATEMENT CONTRACTOR

A. “Air Sampling" shall mean the process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure utilized for

asbestos follows the NIOSH Standard Analytical Method 7400 or the provisional transmission electron microscopy methods developed by the USEPA and/or National Institute of Standard and Technology which are utilized for lower detectability and specific fiber identification.

B. Air monitoring of asbestos abatement contractor's personnel will be performed in conformance with OSHA requirements, (All costs associated with this work are deemed included in the unit price.).

C. Qualifications of Testing Laboratory:

The industrial hygiene laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory identification number shall be submitted and approved by the City. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).

Note: Work area air testing and analysis before, during and upon completion of work (clearance testing) will be performed by a Third Party Air Monitor under separate Contract with the City.

1.06 THIRD PARTY MONITORING AND LABORATORY

A. The NYCDDC, at its own expense, will employ the services of an independent Third Party Air Monitoring Firm and Laboratory. The Third Party Air Monitor will perform air sampling activities and project monitoring at the Work Site.

B. The Laboratory will perform analysis of air samples utilizing Phase Contrast Microscopy (PCM) and/or Transmission Electron Microscopy (TEM).

C. The Third Party Air Monitoring Firm and the designated Project Monitor shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the asbestos abatement contractor to verify that said performance complies with this Specification. The Third-Party Air Monitor shall be on site throughout the entire abatement operation.

D. The NYCDDC will be responsible for costs incurred with the Third Party Air Monitoring Firm and laboratory work. Any subsequent additional testing required due to limits exceeded during initial testing shall be paid for by the asbestos abatement contractor.

1.07 PAYMENT REQUEST DOCUMENTATION

A. 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.

B. 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.

C. EXPOSURE LOG: With this final payment, the asbestos abatement contractor shall submit a listing of the names and social security numbers of all employees actively engaged in the abatement work of this Contract. This list shall include a summary showing each part of the abatement work in which the employee was engaged and the dates thereof.

1.08 QUANTITY CALCULATIONS

In order to determine the square footage involved for the various pipe sizes of pipe insulation that might be encountered, the following table is to be used.

PIPE INSULATION SIZE O.D.	PIPE SIZE O.D.	SQUARE FOOTAGE PER LINEAR FOOT
2-1/2"	1/2"	0.65
2-3/4"	3/4"	0.72

3"	1"	0.79
3-1/4"	1-1/4"	0.85
3-1/2"	1-1/2"	0.92
4"	2"	1.05
4-1/2"	2-1/2"	1.18
5”	3”	1.31
6"	3-1/4"	1.57
7"	3-1/2"	1.83
8"	4"	2.09
9”	5"	2.36
10"	6"	2.62
12"	8"	3.14
14"	10"	3.67
16"	12"	4.19
18"	l4”	4.71

1.09 METHOD OF PAYMENT

Payment shall be made in accordance with Items A through R below. Payment shall be calculated based on the actual quantity of the item performed by the asbestos abatement contractor, times the unit price specified below. Credits may apply to certain times, as specified below.

A. **REMOVAL, DISPOSAL AND REPLACEMENT OF ASBESTOS CONTAINING PIPE INSULATION:** Actual linear footage, multiplied by the square footage factor listed for the respective pipe size in Section 1.08, multiplied by the unit price in Section 1.04.

1. EXAMPLE: 100 lin.ft. of 1/2" pipe and 100 lin.ft. of 6" pipe, including elbows, tees. Flanges, etc.
2. 100 X 0.65 = 65 sq.ft. 65 x unit price = Payment
3. 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.

1. EXAMPLE: Item B. removal and replacement of 1000 S.F. of boiler insulation (incl. Silicate block)
2. 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 02 82 13
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 Fort Washington Armory, 16 Fort Washington Avenue, New York, NY 10032.

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 (CD) Drawings titled "Fort Washington Armory Roof Replacement" dated 10/09/23, prepared by H3 Hardy Collaboration Architecture, LLC (H3).

2. Asbestos survey performed by LiRo engineers, Inc. titled, "Asbestos Survey Services Fort Washington Armory Roof Replacement" dated 10/16/19.

D. The phasing and scheduling of work for this project shall be coordinated with and approved by the Construction Project Manager and Facility Manager. The Construction Project Manager and Facility Manager will make the final determination on all issues under this Contract covered by this Specification.

1.02 SCOPE OF WORK

A. The asbestos abatement contractor is to provide all labor, materials, equipment, services, testing, appurtenances, permits and agreements necessary to perform the work required for the abatement of ACM as required by these contract documents. All work shall be performed in accordance with this Specification, EPA regulations, OSHA regulations, New York City Local Law 70, Title 15, Chapter 1 RCNY, New York State Industrial Code 56, NIOSH recommendations, and any other applicable federal, state or local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.

B. The intent of this Specification section is to ensure that the asbestos abatement contractor is responsible for the following:

1. Abatement of all ACM.

2. Cleaning and decontamination of the entire affected area.

3. Demolition that may be required to access ACM in each area, Asbestos abatement contractor shall dispose of all debris associated with demolition activities as ACM waste.

4. Removal and disposal of all ACM found within these areas such as Drain Flashing/Tar (Black), Stack/Flue Flashing/Tar (Black), Roof Membrane Bottom Layer and Contaminated Top Layer (Black), Base Flashing/Bottom Layer and Contaminated Top Layer (Black), Caulk/Waterproofing Tar on Sheet Metal Coping (Black), Pitch Pockets Sealant/Tar (Black), Access Ladders Pitch Pocket Tar (Black), Clerestory Frame Tar Waterproofing Membrane Flashing/Tar (Black), Dunnage Flashing/Tar (Black), Parapet Wall Tar Waterproofing Membrane (Black), Access Hatch & Skylight Flashing/Tar (Black), Exhaust Flashing/Tar (Black), Parapet Wall Covering/Tar Waterproofing Membrane (Black), Wall (West) Tar Waterproofing Material/Membrane (Black), Tar Paper Membrane Beneath Copper Siding/Counter Flashing (Black), Duct Work Penetration Flashing/Tar (Black), Wall Plaster 2nd Layer (Brown) and contaminated 1st Layer (White).

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: Roof Plan Work Area 1 & 2

a. Remove and dispose of asbestos-containing Drain Flashing/Tar (Black), Stack/Flue Flashing/Tar (Black), Pitch Pocket Sealant/Tar (Black), Roof Membrane Bottom Layer and Contaminated Top Layer (Black), Base Flashing/Bottom Layer and Contaminated Top Layer (Black), Caulk/Waterproofing Tar on Sheet Metal Coping (Black) within **Work Area 1.** Asbestos- Drain Flashing/Tar (Black), Stack/Flue Flashing/Tar (Black), Pitch Pocket Sealant/Tar (Black),Roof Membrane Bottom Layer and Contaminated Top Layer (Black), Base Flashing/Bottom Layer and Contaminated Top Layer (Black), Caulk/Waterproofing Tar on Sheet Metal Coping (Black) shall be removed utilizing NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal.

b. Remove and dispose of asbestos-containing Drain Flashing/Tar (Black), Stack/Flue Flashing/Tar (Black), Pitch Pocket Sealant/Tar (Black), Roof Membrane Bottom Layer and Contaminated Top Layer (Black), Base Flashing/Bottom Layer and Contaminated Top Layer (Black), Caulk/Waterproofing Tar on Sheet Metal Coping (Black) within **Work Area 2.** Asbestos- Drain Flashing/Tar (Black), Stack/Flue Flashing/Tar (Black), Pitch Pocket Sealant/Tar (Black), Roof Membrane Bottom Layer and Contaminated Top Layer (Black), Base Flashing/Bottom Layer and Contaminated Top Layer (Black), Caulk/Waterproofing Tar on Sheet Metal Coping (Black) shall be removed utilizing NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
1 Roof B	NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal	32 Sq. Ft. of Drain Flashing/Tar (Black)	
		16 Sq. Ft. of Stack/Flue Flashing/Tar (Black)	
		24 Sq. Ft. of Pitch Pockets Sealant/Tar (Black)	
		10,700 Sq. Ft. of Roof Membrane Bottom Layer and Contaminated Top Layer (Black)	
		1,000 Sq. Ft. of Base Flashing/Bottom Layer and Contaminated Top Layer (Black)	
		150 Sq. Ft. Caulk/Waterproofing Tar on Sheet Metal Coping (Black)	
2 Roof C	NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal	32 Sq. Ft. of Drain Flashing/Tar (Black)	
		16 Sq. Ft. of Stack/Flue Flashing/Tar (Black)	
		24 Sq. Ft. of Pitch Pockets Sealant/Tar (Black)	
		10,700 Sq. Ft. of Roof Membrane Bottom Layer and Contaminated Top Layer (Black)	
		1,000 Sq. Ft. of Base Flashing/Bottom Layer and Contaminated Top Layer (Black)	
		150 Sq. Ft. Caulk/Waterproofing Tar on Sheet Metal Coping (Black)	

2. Drawing H003.00 Roof Plan Work Area 3 & 4

a. Remove and dispose of asbestos-containing Roof Membrane (Black), Base Flashing (Black), Access Ladders Pitch Pocket Tar (Black), Clerestory Frame Tar Waterproofing Membrane Flashing/Tar (Black) within **Work Area 3.** Asbestos-containing Roof Membrane (Black), Base Flashing (Black), Access Ladders Pitch Pocket Tar (Black), Clerestory Frame Tar Waterproofing Membrane Flashing/Tar (Black) shall be

removed utilizing NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal.

b. Remove and dispose of asbestos-containing Dunnage Flashing/Tar (Black), Roof Membrane/Bottom Layer (Black), Base Flashing/Top and Bottom Layer (Black), Pitch Pocket Tar (Black), Parapet Wall Tar Waterproofing Membrane (Black), Clerestory Frame Tar Waterproofing Membrane (Black) within **Work Area 4.** Asbestos-containing Dunnage Flashing/Tar (Black), Roof Membrane/Bottom Layer (Black), Base Flashing/Top and Bottom Layer (Black), Pitch Pocket Tar (Black), Parapet Wall Tar Waterproofing Membrane (Black), Clerestory Frame Tar Waterproofing Membrane (Black) shall be removed utilizing NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
3 Roof E	NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal	5,500 Sq. Ft. of Roof Membrane (Black)	
		600 Sq. Ft. of Base Flashing (Black)	
		16 Sq. Ft. of Access Ladders Pitch Pocket Tar (Black)	
		300 Sq. Ft. of Clerestory Frame Tar Waterproofing Membrane Flashing/Tar (Black)	
4 Roof F	NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal	80 Sq. Ft. of Dunnage Flashing/Tar (Black)	
		5,500 Sq. Ft. of Roof Membrane/Bottom Layer (Black)	
		600 Sq. Ft. of Base Flashing/Top and Bottom Layer (Black)	
		8 Sq. Ft. of Pitch Pocket Tar (Black)	
		450 Sq. Ft. of Parapet Wall Tar Waterproofing Membrane (Black)	
		300 Sq. Ft. of Clerestory Frame Tar Waterproofing Membrane (Black)	

3. Drawing H004.00 Roof Plan Work Area 5, 6 & 7

a. Remove and dispose of asbestos-containing Access Hatch & Skylight Flashing/Tar (Black), Exhaust Flashing/Tar (Black), Parapet Wall Covering/Tar Waterproofing Membrane (Black), Wall (West) Tar Waterproofing Material/Membrane (Black), Roof Membrane Bottom Layer (Black), Base Flashing/Top and Bottom Layers (Black), Tar Paper Membrane Beneath Copper Siding/Counter Flashing (Black) within

Work Area 5. Asbestos-containing Access Hatch & Skylight Flashing/Tar (Black), Exhaust Flashing/Tar (Black), Parapet Wall Covering/Tar Waterproofing Membrane (Black), Wall (West) Tar Waterproofing Material/Membrane (Black), Roof Membrane Bottom Layer (Black), Base Flashing/Top and Bottom Layers (Black), Tar Paper Membrane Beneath Copper Siding/Counter Flashing (Black) shall be removed utilizing NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal.

b. Remove and dispose of asbestos-containing Exhaust Flashing/Tar (Black), Parapet Wall Tar Waterproofing Membrane (Black), Roof Membrane/Bottom Layer (Black), Base Flashing/Top and Bottom Layers (Black), Tar Paper Membrane Beneath Copper Siding/Counter Flashing (Black), Wall (West) Tar Waterproofing Material/Membrane (Black) within **Work Area 6.** Asbestos-containing Exhaust Flashing/Tar (Black), Parapet Wall Tar Waterproofing Membrane (Black), Roof Membrane/Bottom Layer (Black), Base Flashing/Top and Bottom Layers (Black), Tar Paper Membrane Beneath Copper Siding/Counter Flashing (Black), Wall (West) Tar Waterproofing Material/Membrane (Black) shall be removed utilizing NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal.

c. Remove and dispose of asbestos-containing Exhaust Flashing/Tar (Black), Duct Work Penetration Flashing/Tar (Black), Stack/Flue Flashing/Tar (Black), Wall (West) Tar Waterproofing Material/Membrane (Black), Roof Membrane/Bottom Layer (Black), Base Flashing (Black), Tar Paper Membrane Beneath Copper Siding/Counter Flashing (Black), Parapet Wall Tar Waterproofing Membrane (Black) within **Work Area 7.** Asbestos-containing Exhaust Flashing/Tar (Black), Duct Work Penetration Flashing/Tar (Black), Stack/Flue Flashing/Tar (Black), Wall (West) Tar Waterproofing Material/Membrane (Black), Roof Membrane/Bottom Layer (Black), Base Flashing (Black), Tar Paper Membrane Beneath Copper Siding/Counter Flashing (Black), Parapet Wall Tar Waterproofing Membrane (Black) shall be removed utilizing NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
5 Roof D	NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal	45 Sq. Ft. of Access Hatch & Skylight Flashing/Tar (Black)	
		45 Sq. Ft. of Exhaust Flashing/Tar (Black)	
		150 Sq. Ft. of Parapet Wall Covering/Tar Waterproofing Membrane (Black)	
		450 Sq. Ft. of Wall (West) Tar Waterproofing Material/Membrane (Black)	
		1,800 Sq. Ft. of Roof Membrane Bottom Layer (Black)	
		300 Sq. Ft. of Base Flashing/Top and Bottom Layers (Black)	
		180 Sq. Ft. of Tar Paper Membrane Beneath Copper Siding/Counter Flashing (Black)	
6 Roof G	NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal	24 Sq. Ft. of Exhaust Flashing/Tar (Black)	
		160 Sq. Ft. of Parapet Wall Tar Waterproofing Membrane (Black)	
		2,500 Sq. Ft. of Roof Membrane/Bottom Layer (Black)	
		400 Sq. Ft. of Base Flashing/Top and Bottom Layers (Black)	
		120 Sq. Ft. of Tar Paper Membrane Beneath Copper Siding/Counter Flashing (Black)	
		500 Sq. Ft. of Wall (West) Tar Waterproofing Material/Membrane (Black)	

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
7 Roof H	NYCDEP Title 15 Chapter 1 § 1-107 Foam Procedures for Roof Removal	24 Sq. Ft. of Exhaust Flashing/Tar (Black)	
		40 Sq. Ft. of Duct Work Penetration Flashing/Tar (Black)	
		4 Sq. Ft. of Stack/Flue Flashing/Tar (Black)	
		300 Sq. Ft. of Wall (West) Tar Waterproofing Material/Membrane (Black)	
		350 Sq. Ft. of Roof Membrane/Bottom Layer (Black)	
		180 Sq. Ft. of Base Flashing (Black)	
		60 Sq. Ft. of Tar Paper Membrane Beneath Copper Siding/Counter Flashing (Black)	
		180 Sq. Ft. of Parapet Wall Tar Waterproofing Membrane (Black)	

4. Drawing H005.00 Partial 4th Floor Plan Work Area 8

a. Remove and dispose of asbestos-containing Wall Plaster 2nd Layer (Brown) and contaminated 1st Layer (White) within **Work Area 8.** Asbestos-containing Wall Plaster 2nd Layer (Brown) and contaminated 1st Layer (White) 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.)
8	NYCDEP Title 15 Chapter 1 Full Containment Procedures	4,500 Sq. Ft. of Wall Plaster 2nd Layer (Brown) and contaminated 1st Layer (White)	

The facility is under the jurisdiction of the NYC Department of Homeless Services. 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.

D. 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.

E. 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.

F. 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.

G. The asbestos abatement contractor shall retain a certified Project Designer for the preparation of an Asbestos Variance Application (ACP-9), if required.

H. 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.

I. 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.

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 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.

K. For coordination with other Asbestos abatement contractors, see the General Conditions governing all Contracts.

L. 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.

M. 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.

N. 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:

2. Shall be performed at no additional charge to the City.

3. Shall be performed at times not interfering with the other activities in the building.

4. Shall be performed only with written consent from the Commissioner and the Facility Manager.

5. 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.

O. 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.

P. 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 demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (5) below. The asbestos abatement contractor must submit documentation demonstrating compliance with all listed requirements. 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, as an "Asbestos Abatement Contractor".

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 provide evidence of having successfully performed and completed in a timely fashion at least 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 of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work; brief description of the 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, 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.

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. Physical considerations and conditions of both the material and structure. These considerations include any obstacles or obstructions encountered in accessing or removing the material.

2. Handling, storage, transportation and disposal of the material.

3. Availability of qualified and skilled labor.

4. Availability of utilities.

5. Exact quantities of all materials to be disturbed and/or removed.

1.04 WORK BY OTHERS

The City reserves the right during the term of this Contract to have work performed on asbestos abatement projects by other asbestos abatement contractors as the situation warrants.

1.05 DEFINITIONS

A. General Explanation: Certain terms used in this Specification Section are defined below. Definitions and explanations of this Specification Section are not necessarily complete or exclusive, but are general for the Work to the extent they are not stated more explicitly in another element of the Contract Documents.

B. Definitions in General Use:

1. Approve: Where used in conjunction with Engineer's response to submittals, requests, applications, inquiries, reports and claims by Asbestos abatement contractor, the meaning of term "approved" will be held to limitations of

Engineer's responsibilities and duties as specified in Contract Documents. In no case will "approval" by Engineer be interpreted as a release of Asbestos abatement contractor from responsibilities to fulfill requirements of Contract Documents.

2. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Engineer," "requested by Engineer," and similar phrases. However, no such implied meaning will be interpreted to extend Engineer's responsibility into Asbestos abatement contractor's responsibility for construction supervision.

3. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

4. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on Drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.

5. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at Project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.

6. Installer: The term "installer" is defined as the entity (person or firm) engaged by the asbestos abatement contractor, or its sub-asbestos abatement contractor for performance of a particular unit of work at Project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to perform.

7. Provide: Except as otherwise defined in greater detail, term “provide” means furnish and install, complete and ready for intended use, as applicable in each instance.

8. Third-Party Air Monitor: The term “Third-Party Air Monitor ” is defined as an entity engaged by City and Construction Project Manager to perform specific inspections or tests of the work, either at Project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.

C. Definitions Relative to Asbestos Abatement:

1. Abatement: Any and all procedures physically taken to control fiber release from asbestos-containing materials. This includes removal, encapsulation, enclosure, cleanup and repair.

2. Adequately Wet: The complete penetration of a material with amended water to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material, then the material has not been adequately wetted. However, the absence of visible emissions is not evidence of being adequately wet. ACM must be fully penetrated with the wetting agent in order to be considered adequately wet. If the ACM being abated is resistant to amended water penetration, wetting agent shall be applied to the material prior to and during removal as necessary to minimize fiber release.

3. Aggressive Sampling: Method of sampling in which the individual collecting the air sample creates activity by the use of mechanical equipment during the sampling period to stir up settled dust and simulate activity in that area of the building.

4. AHERA: Asbestos Hazard Emergency Response Act of 1986

5. AIHA: American Industrial Hygiene Association.

6. Airlock: System for permitting entrance and exit while restricting air movement between a contaminated area and an uncontaminated area. It consists of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.

7. Air Sampling: Process of measuring the fiber content of a known volume of air collected during a specific period. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method 7400, or the provisional transmission electron microscopy methods developed by the US EPA which is utilized for lower detection levels and specific fiber identification.

8. Ambient Air Monitoring: “Ambient air monitoring” shall mean measurement or determination of airborne asbestos fiber concentrations outside but in the general vicinity of the worksite.

9. Amended Water: Water to which a surfactant has been added.

10. ANSI: American National Standards Institute

11. Area Air Sampling: Any form of air sampling or monitoring where the sampling device is placed at some stationary location.

12. Asbestos: Any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cumingtonite-grunerite), crastmocidolite (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. NYCDEP or DEP: The New York City Department of Environmental Protection.

38. 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.

39. DOB: The New York City Department of Buildings.

40. 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.

41. ELAP: Environmental Laboratory Approval Program administered by the New York State Department of Health.

42. 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.

43. 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.

44. 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.

45. EPA or USEPA: United States Environmental Protection Agency.

46. 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.

47. 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.

48. FDNY: The Fire Department of the City of New York.

49. 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.

50. 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.

51. 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.

52. 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.

53. HEPA vacuum equipment: “HEPA vacuum equipment” shall mean vacuuming equipment with a HEPA filter.

54. Holding Area: Chamber in the equipment decontamination enclosure located between the washroom and an uncontaminated area.

55. Homogeneous Work Area: Portion of the Work Area that contains one type of ACM and/or where one type of abatement is used.

56. 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.

57. 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.

58. 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.

59. 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.

60. 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.

61. 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.

62. Movable Object: Unit of equipment or furniture in the Work Area that can be removed from the Work Area.

63. 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.

64. NESHAPS: National Emission Standards for Hazardous Air Pollutants.

65. NFPA: The National Fire Protection Association.

66. NIOSH: National Institute for Occupational Safety and Health.

67. DEP or NYCDEP: New York City Department of Environmental Protection

68. NYSDOL: New York State Department of Labor.

69. 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.

70. NYSDOH: The New York State Department of Health.

71. 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.

72. 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.

73. OSHA: Occupational Safety and Health Administration.

74. Outside air: “Outside air” shall mean the air outside the work place.

75. 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.

76. 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.

77. Personal Protective Equipment (PPE): Appropriate protective clothing, gloves, eye protection, footwear, and head gear.

78. Phase Contrast Microscopy (PCM): The measurement protocol for the assessment of the fiber content of air. (NIOSH Method 7400).

79. Physician: Person licensed or otherwise authorized under Article 131 Section 65.22 of the New York State Education Law.

80. Plasticize: To cover floors and walls with fire retardant plastic sheeting as herein specified or by using spray plastics as acceptable to the Department.

81. 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)

82. Project Designer: A person who holds a valid Project Designer Certificate issued by the New York State Department of Labor.

83. Project Monitor: A person who holds a valid Project Monitor Certificate issued by the New York State Department of Labor.

84. 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.

85. 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.

86. 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.

87. 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.

88. 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.

89. 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.

90. Replacement material: Any material used to replace ACM that contains less than .01 percent asbestos.

91. Shift: A worker's, or simultaneous group of workers', complete daily term of work.

92. 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.

93. 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.

94. Staging Area: Work Area near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the Work Area.

95. Strip: To remove asbestos materials from any part of the facility.

96. 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.

97. Surface barriers: The plasticizing of walls, floors, and fixed objects within the work area to prevent contamination from subsequent work.

98. Surfactant: Chemical wetting agent added to water to improve penetration.

99. 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.

100. Visible Emissions: Emissions containing particulate material that are visually detectable without the aid of instruments.

101. 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.

102. 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.

103. 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.

104. Wet methods: “Wet methods” shall mean the use of amended water or removal encapsulants to minimize the generation of fibers during ACM disturbance.

105. Work Area: Designated rooms, spaces, or areas of the building or structure where asbestos abatement activities take(s) place.

106. 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.

107. Work Place: The work area and the decontamination enclosure system(s).

108. 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.

109. 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 telephone. 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. 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. The 8-hour time weighted average airborne concentration of fibers to which any passerby may be exposed shall not exceed 0.01 fibers per cubic centimeter of air when fibers have a physical dimension longer than 5 micrometers as determined by the method prescribed in these Specifications.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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. The general contractor shall submit, as required, an asbestos abatement permit due to one or more of the activities listed in 1.07 (B) (1-8) and (B) (13) of this specification. The asbestos abatement contractor is responsible for submitting, with an asbestos project notification, a work place safety plan (WPSP) and any other applicable construction documents. These documents must be prepared 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 asbestos abatement 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 general contractor 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, and shall be advised on safe decontamination.

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 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, 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 NYCDEP 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 persons who will be employed by him in 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.

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 on title page the project name, name, address and phone number of Environmental Control Representative; name, address and phone number of asbestos abatement contractor; name, address and phone number of asbestos abatement contractor and City's air testing entity; emergency numbers including, but not limited to local Fire/Rescue Department. Log book shall contain a list of personnel approved by the laboratory 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 a copy of the logbook containing a day-to-day record of personnel log entries countersigned by the Construction Project Manager every day.

r. 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. 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 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 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 and NYSDOL 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).

9. The asbestos abatement contractor shall submit one of the following certifications to the DOB, 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 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.

E. The asbestos abatement contractor will have at all times in his possession and in view at the job site the OSHA regulations 29 CFR 1910.1001, and 1926.1101 Asbestos, and Environmental Protection Agency 40 CFR, Part 61, subpart B: National Emission Standard for asbestos, asbestos stripping, work practices and disposal of asbestos waste. He shall also have one copy of NYC Title 15, Chapter 1 of RCNY and NYS DOL ICR 56 at the job site at all times.

F. Familiarity with Pertinent Codes and Standards: In procuring all items used in this work, it is the asbestos abatement contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this work meet or exceed the specified requirements, and are suitable for their intended use.

G. Rejection of Non Complying Items: The Commissioner reserves the right to reject items incorporated into the work that fail to meet the specified minimum requirements. The Commissioner further reserves the right, and without prejudice to other recourse that maybe taken, to accept non-complying items subject to an adjustment in the Contract amount as approved by the City.

H. Applicable Regulations, Codes and Standards: Applicable standards listed in these Specifications include, but are not necessarily limited to, standards promulgated by the following agencies and organizations:

1. American National Standards Institute (ANSI)
(Successor to USASI and ASA)
25 West 43rd Street (between 5th and 6th Avenue) 4th Floor
New York, NY 10036
212-642-4900

2. American Society for Testing and Materials (ASTM)
100 Bar Harbor Drive
West Conshohocken, PA 19428-2959
610-832-9500

3. National Institute for Occupational Safety and Health (NIOSH)
Robert A. Taft Laboratory
4676 Columbia Pkwy
Mailstop R12 Cincinnati, Ohio 45226
513-841-4428

4. National Electrical Code (NEC)
See NFPA

5. National Fire Protection Association (NFPA)
1 Batterymarch Park
Quincy, Massachusetts 02169-7471
617-770-3000

6. New York City Fire Department (FDNY)
9 Metrotech Center
Brooklyn, NY 11201-5431
718-999-2117

7. New York City Department of Buildings (NYC DOB)
Enforcement Division
280 Broadway, New York, New York 10007
212- 566-2850

8. New York City Department of Environmental Protection (NYCDEP)
Bureau of Environmental Compliance
Asbestos Control Program
59-17 Junction Boulevard, 8th Floor
Corona, New York 11368
718-595-3682

9. New York City Department of Health and Mental Hygiene (NYC DOHMH)
Environmental Investigation
125 Worth Street
New York, New York 10013
212-442-3372

10. New York State Department of Labor (NYSDOL)
Division of Safety and Health
Engineering Services Unit
State Office Building Campus
Albany, New York 12240-0010

11. New York City Department of Sanitation
125 Worth Street, Room 714
New York, New York 10013
212-566-1066

12. Occupational Safety and Health Administration (OSHA)
Region II - Regional Office
201Varick Street, Room 908
New York, New York 10014
212-337-2378

13. United States Environmental Protection Agency (EPA or USEPA)
Region II
Asbestos NESHAPS Contact
Air and Waste Management Division
(Air Compliance Branch) – USEPA
290 Broadway, 21st Floor
New York, New York 10007-1866
212-637-3660

I. Post all applicable regulations in a conspicuous place at the job site. Assure that the regulations are not altered, defaced or covered by other materials. One copy of each regulation must also be kept at the Asbestos abatement contractor's office.

1.11 CITY/ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITIES

A. The normal occupants of the Work Areas will be relocated by the City prior to the performance of the abatement work and returned there to at the conclusion of the abatement work, at no cost to the asbestos abatement contractor. However, the asbestos abatement contractor shall protect all furniture and equipment in the Work Areas in a manner as hereinafter specified. In addition, the asbestos abatement contractor shall perform the work of this Contract in a manner that will be least disruptive to the normal use of the non-Work Areas in the building.

B. Asbestos abatement contractor shall be responsible for cleaning all portable items not specifically addressed by the Facility, in the Work Areas, or dispose of same as asbestos contaminated waste.

C. Facility to provide asbestos abatement contractor with a list of items that cannot be removed and need special attention.

D. Facility to stop all deliveries that may be scheduled to the Work Area while work is in progress.

E. Facilities to have authorized personnel on site at all times or supply the asbestos abatement contractor with means of contacting such personnel without unreasonable delay. Such personnel shall have access to all areas, have knowledge of electrical, and air handling equipment. Such personnel shall assist the asbestos abatement contractor in case of any power failure or breakdown to shut down air supply systems, to reset and control all protective systems such as alarms, sprinklers, locks, etc. The Facility shall ensure no active air handling systems are operating within the Work Area.

F. City will not occupy the portions of the building, in which work is being performed during the entire asbestos removal operation, including completion of clean up.

G. Asbestos abatement contractor shall provide a plan for 24 hour job security both for prevention of theft and for barring entry of curious but unprotected personnel into Work Areas.

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.

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. Insure that employees use proper engineering controls, proper work practices, proper personal protective equipment and proper decontamination procedures.

5. The competent person (as defined in OSHA1926.1101) shall check for rips and tears in work suits, and ensure that they are mended immediately or replaced.

1.12 USE OF BUILDING FACILITIES

A. City shall make available to the asbestos abatement contractor, from existing outlets and supplies, all reasonably required amounts of water and electric power at no charge.

B. Electric power to all Work Areas shall be shut down and locked out except for electrical equipment that must remain in service. Safe temporary power and lighting shall be provided by asbestos abatement contractor in accordance with applicable codes. All power to Work Areas shall be brought in from outside the area through ground-fault interrupter circuits installed at the source. Stationary electrical equipment within the Work Area, which must remain in service, shall be adequately protected, enclosed and ventilated. The Facility will identify all electric lines that must remain in service. Asbestos abatement contractor shall protect all lines.

C. Asbestos abatement contractor shall provide, at his own expense, all electrical, water, and waste connections, tie-ins, extensions, and construction materials, supplies, etc. All water tie-ins shall be hard piped with polyethylene or copper piping. At the end of each shift, asbestos abatement contractor shall disconnect all hoses within the work zone and place in equipment room of the worker decontamination unit. Asbestos abatement contractor shall ensure positive shutoff of all water to Work Area during non-working hours.

D. Utilities:

1. General:
   All temporary facilities required to be installed, shall be subject to the approval of the Commissioner. Prior to starting the work at any site; specify clearly the temporary locations of facilities preferably with sketches and submit the same to the Construction Project Manager for approval.

2. Water:
The Department of Design and Construction will furnish all water needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. All temporary plumbing or adaptations to supply the needs of the Work Area shall be installed and removed by the asbestos abatement contractor and the cost thereof included in the Lump Sum price for abatement work. Shower water for the decontamination unit shall be provided hot. Heating of water, if necessary, shall be provided by the asbestos abatement contractor.

3. Electricity:
The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. All temporary electrical work or adaptations to supply the needs of the Work Area shall be installed and removed by the asbestos abatement contractor and the cost thereof included in the Lump Sum price for abatement work.

In leased spaces, arrangements for water supplies and electricity must be made with the landlord. However, all such arrangements must be made through and are subject to approval of the Department of Design and Construction. Utilities will be provided at no cost to the Asbestos abatement contractor. However, it is the asbestos abatement contractor's (or the General contractor's) responsibility to furnish and install a suitable distribution system to the Work Area. This system will be provided at no cost to the City.

A dedicated power supply for the negative pressure ventilating units shall be utilized. The negative air equipment shall be on a ground fault circuit interrupter (GFCI) protected circuit separate from the remainder of the work area temporary power circuits.

E. Asbestos abatement contractor shall shut down and lock out all electric power to all work areas except for electrical equipment that must remain in service. Safe temporary power and lighting shall be provided in accordance with all applicable codes. Existing light sources (e.g., house lights) shall not be utilized. All power to work areas shall be brought in from outside the area through ground-fault circuit interrupter at the source.

1. If electrical circuits, machinery, and other electrical systems in or passing though the work area must stay in operation due to health and safety requirements, the following precautions must be taken:

a. All unprotected cables, except low-voltage (less than 24 volts) communication and control system cables, panel boxes of cables and joints in live conduit that run through the work area shall be covered

with three (3) independent layers of six (6) mil fire retardant polyethylene. Each layer shall be individually duct taped and sealed. All three (3) layers of polyethylene sheeting shall be left in place until satisfactory clearance air sampling results have been obtained.

b. Any energized circuits remaining in the work area shall be posted with a minimum two (2) inch high lettering warning sign which reads: DANGER LIVE ELECTRICAL - KEEP CLEAR. A sign shall be placed on all live covered barriers at a maximum of ten (10) foot intervals. These signs shall be posted in sufficient numbers to warn all persons authorized to enter the work area of the existence of the energized circuits.

2. Any source of emergency lighting which is temporarily blocked as a result of work place preparation shall be replaced for the duration of the project by battery operated or temporary exit signs, exit lights, or photo luminescent path markings.

F. Asbestos abatement contractor shall provide a separate temporary electric panel board to power asbestos abatement contractor’s equipment. The Facility will designate an existing electrical source in proximity to the Work Area. Asbestos abatement contractor's licensed electrician shall provide temporary tie-in via cable, outlet boxes, junction boxes, receptacles and lights, all with ground fault interruption. At no time shall extension cords greater than 50-feet in length be allowed. All temporary electrical installation shall be in accordance with OSHA regulations. The electric shut down for power panel tie-in will be on off-hours and must be coordinated with the Facility. Asbestos abatement contractor shall provide to the City a specification and drawing outlining his power requirements at the pre-construction meeting.

G. Additional electrical equipment (i.e., transformers, etc.), which is necessary due to the lack of existing power on the floor, shall be at the asbestos abatement contractor's expense.

H. Asbestos abatement contractor shall provide fire protection in accordance with all State and Local fire codes.

I. Sprinklers, standpipes, and other fire suppression systems shall remain in service and shall not be plasticized.

J. When temporary service lines are no longer required, they shall be removed by the asbestos abatement contractor. Any parts of the permanent service lines, grounds and buildings, disturbed or damaged by the installation and/or removal of the temporary service lines, shall be restored to their original condition by the 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 system shall NOT be used to remove refuse.

E. Debris shall be removed from the work site daily. Premises shall be left neat and clean after each work shift, so that work may proceed the next regular workday without interruption. Limited bag storage may take place within the Work Area when approved by the Construction Project Manager.

F. Protect floors and walls along removal routes from damage, wear and staining with contamination control flooring. All finished surfaces to be protected with Masonite or other rigid sheathing material.

G. A preliminary inspection for pre-existing damage shall be conducted by asbestos abatement contractor and representative of the City before commencement of the project.

1.15 RESPIRATORY PROTECTION REQUIREMENTS

A. Respiratory protection shall be worn by all individuals who may be exposed to asbestos fibers from the initiation of the asbestos project until all areas have

successfully passed clearance air monitoring in accordance with Regulations and these Specifications.

B. Asbestos abatement contractor shall develop and implement a written respiratory protection program with required site-specific procedures and elements. The program shall be administered by a properly trained individual. The written respiratory protection program shall include the requirements set forth in OSHA Standard 29 CFR 1910.134, at a minimum.

C. The Asbestos abatement contractor shall provide workers with individually issued and marked respiratory equipment. Respiratory equipment shall be suitable for the asbestos exposure level(s) in the Work Area(s), as specified in OSHA Standards 26 CFR 1910.134 and 29 CFR 1926.1101, NIOSH Standard 42 CFR 84, or as more stringently specified otherwise, herein.

D. Where respirators with disposable filter parts are employed, the asbestos abatement contractor will provide sufficient filter parts for replacement as necessary or as required by the applicable regulation.

E. All respiratory protection shall be NIOSH approved. All respiratory protection shall be provided by asbestos abatement contractor, and used by workers in conjunction with the written respiratory protection program.

F. Asbestos abatement contractor shall provide respirators selected by an Industrial Hygienist that meet the following requirements:

Table 1. -- Assigned Protection Factors[5]

Type of Respirator[1,2]	Half mask	Full facepiece	Helmet/hood
1. Air-Purifying Respirator	[3]10	50	……
2. Powered Air-Purifying Respirator (PAPR)	50	1,000	[4]25/1,000
3. Supplied-Air Respirator (SAR) or Airline Respirator			
• Demand mode	10	50	……
• Continuous flow mode	50	1,000	[4]25/1,000
• Pressure-demand or other positive-pressure mode	50	1,000	……

Type of Respirator[1,2]	Half mask	Full facepiece	Helmet/hood
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

Notes:

[1]Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

[2]The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

[3]This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

[4]The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

[5]These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

G. Selection of high efficiency filters:

1. All high efficiency filters shall have a nominal efficiency rating of 100 (99.97-percent effective) when tested against 0.3-micrometer monodisperse diethyl-hexyl phthalate (DOP) particles.

2. Choose N-, R-, or P-series filters based upon the presence or absence of oil particles.

a. N-series filters shall only be used for non-oil solid and water based aerosols or fumes.

b. R- and P-series filters shall be used when oil aerosols or fumes (i.e., lubricants, cutting fluids, glycerin, etc.) are present. The R-series filters are oil resistant and the P-series filters are oil proof.

c. Follow filter manufacture recommendations.

3. If a vapor hazard exists, use an organic vapor cartridge in combination with the high efficiency filter.

H. Historical airborne fiber level data may serve as the basis for selection of the level of respiratory protection to be used for an abatement task. Historical data provided by the asbestos abatement contractor shall be based on personal air monitoring performed during work operations closely resembling the processes, type of material, control methods, work practices, and environmental conditions present at the site. Documentation of aforementioned results may be requested by the City and/or Third-Party Air Monitor for review. This will not relieve the asbestos abatement contractor from providing personal air monitoring to determine the time-weighted average (TWA) for the work under contract. The TWA shall be determined in accordance with 29 CFR 1926.1101.

I. At no time during actual removal operations shall half-mask air purifying respirators be allowed unless a full 8-hour TWA and excursion limit have been conducted, and reviewed by the Construction Project Manager. If the TWA and excursion limit have not been conducted, a Supplied-Air Respirator (SAR) or Airline Respirator or Self-Contained Breathing Apparatus (SCBA) must be used. Use of single use dust respirators is prohibited for the above respiratory protection.

J. Workers shall be provided with personally issued and individually marked respirators. Respirators shall not be marked with any equipment that will alter the fit of the respirator in any way. Only waterproof identification markers shall be used.

K. Asbestos abatement contractor shall ensure that the workers are qualitatively or quantitatively fit tested by an Industrial Hygienist initially and every 12 months thereafter with the type of respirator he/she will be using.

L. Whenever the respirator design permits, workers shall perform the positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow as specified by the manufacturer.

M. No facial hairs (beards) shall be permitted to be worn when wearing respiratory protection that requires a mask-to-face seal.

N. If a worker wears glasses, a spectacle kit to fit their respirator shall be provided by the asbestos abatement contractor at the asbestos abatement contractor's expense.

O. Respiratory protection maintenance and decontamination procedures shall meet the following requirements:

1. Respiratory protection shall be inspected and decontaminated on a daily basis in accordance with OSHA 29 CFR 1910.134 (b); and

2. High efficiency filters for negative pressure respirators shall be changed after each shower; and

3. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower when going through decontamination procedures as stated in Section 3.03 and/or 3.04.

4. Airline respirators with high efficiency filtered disconnect shall be disconnected in the equipment room and worn into the shower. Powered air-purifying respirator face pieces shall be worn into the shower. Filtered/power pack assemblies shall be decontaminated in accordance with manufacturers recommendations; and

5. Respirators shall be stored in a dry place and in such a manner that the face-piece and exhalation valves are not distorted; and

6. Organic solvents shall not be used for washing of respirators.

P. Authorized visitors shall be provided with suitable respirators and instruction on the proper use of respirators whenever entering the Work Area. Qualitative fit test shall be done to ensure proper fit of respirator.

1.16 PROTECTIVE CLOTHING

A. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. Provide to all workers, foremen, superintendents, authorized visitors and inspectors, protective disposable clothing consisting of full body coveralls, head covers, gloves and 18-inch high boot type covers or reusable footwear.

B. In addition to personal protective equipment for workers, the asbestos abatement contractor shall make available at each worksite at least four (4) additional uniforms and required respiratory equipment each day for personnel who are authorized to inspect the work site. He/she shall also provide, for the duration of the work at any site involving a decontamination unit for worksite access, a lockable storage locker for use by the Construction Project Manager. In addition to respiratory masks for workers, the asbestos abatement contractor must have on hand at the beginning of each work day, at least four (4) masks each with two sets of fresh filters, for use by personnel who are authorized to inspect the worksite. 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-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. Respirators, disposable coveralls, head covers and foot covers shall be provided by the asbestos abatement contractor for the Facilities Representative, Construction Project Manager and any other authorized representative who may inspect the Work Area. Provide two respirators and six respirator filter changes per day.

1.17 AIR MONITORING - ASBESTOS ABATEMENT CONTRACTOR

A. Asbestos abatement contractor shall employ a qualified industrial hygiene laboratory to analyze air samples in accordance with OSHA Regulations, 1926.1101 (Asbestos Standards for Construction) and New York City regulations.

B. 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).

C. Industrial hygiene laboratory shall also be a current proficient participant in the NIST/NVLAP Quality Assurance Program for the identification of bulk samples. Laboratory identification number shall be submitted to and approved by the City.

D. Air monitoring responsibilities for the asbestos abatement contractor’s employees, shall be performed by a representative of the industrial hygiene laboratory retained by the asbestos abatement contractor.

E. Asbestos abatement contractor shall submit to the City all credentials of the designated (as defined in OSHA 1926.1101) and industrial hygiene laboratory representative for approval.

F. Air monitoring and inspection shall be conducted by the Asbestos abatement contractor’s competent person (as defined in OSHA 1926.1101).

G. Continuous (daily or per shift) monitoring and inspection will include Work Area samples, personnel samples from the breathing zone of a worker to accurately determine the employees' 8-hour TWA (unless Type C respirators are used) and decontamination unit clean room samples.

H. Work Area samples and employee personnel samples shall be taken using pumps whose flow rates can be determined to an accuracy of +5-percent, at a minimum of two liters per minute. This must be demonstrated at the job site.

I. Sampling and analysis methods shall be per NIOSH 7400A.

J. Test Reports:

1. Promptly process and distribute one copy of the test results, to the Commissioner.

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 by facsimile notify the Commissioner within 24 hours of the results of each test, followed by written notification within three days.

K. 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.

L. All costs for required air monitoring by the asbestos abatement contractor's competent person shall be borne by the asbestos abatement contractor.

M. 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.

N. All samples shall be accompanied by a Chain of Custody Record that shall be submitted to the Construction Project Manager upon completion of analysis.

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]

		Pre-Abatement	During Abatement	Post Abatement
4.	Exterior Foam and Vertical Surfaces	-	3[c]	3[d]
5.	Interior Foam	6	3[c]	6[d]
	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]

Notes:
a. if more than three (3) tents then two (2) samples required per enclosure.
b. if more than three (3) tents then one (1) sample required per enclosure.
c. samples shall be taken within the work area(s).
d. area 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 voltstructure, 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. Area air sampling during abatement shall be conducted as specified in the following documents except as restricted or modified herein:

1. Measuring Airborne Asbestos Following an Abatement Action, US EPA document 600/4-85-049 (Nov., 1985);

2. Guidance for Controlling Asbestos-Containing Materials in Buildings; US EPA Publication 560/5-85- 024 (June, 1984);

3. Methodology for the Measurement of Airborne Asbestos by Electron Microscopy US EPA Contract No. 68-02- 3266;

4. Mandatory and non-mandatory Electron Microscopy Methods set forth in 40 CFR Part 763, Subpart E, Appendix A.

5. NIOSH 7400 method using "A" counting rules

N. In accordance with the above criteria, area samples (see NYCDEP Asbestos Control Program Regulations) shall conform to the following schedule:

Area Samples for Analysis by	Minimum Volume	Flow Rate
PCM, 25mm cassettes	560 liters	5 to 15 liters/minute
TEM, 25mm cassettes	560 liters	1 to 10 liters/minute
TEM, 37mm cassettes	1,250 liters	1 to 10 liters/minute

O. 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.

P. 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.

Q. 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.

R. 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, 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 information into the DEP ARTS database within 24 hours of work area completion to 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 Third Party Air Monitoring Firm within 48 hours of receipt.

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. Wire brushes maybe used for cleaning pipe joints within glove-bags upon written approval of the Construction Project Manager.

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, NECA 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 NEC, OSHA or other authority.

5. Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead, and rise vertically where wiring will be least subject to damage from operations.

6. Temporary Wiring: In the Work Area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance. Provide liquid tight enclosures or boxes for all wiring devices. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors.

7. Electrical Power Cords: Use only grounded extension cords; use hard service cords where exposed to traffic and abrasion. Use single lengths of cords only.

8. Temporary Lighting: All lighting within the Work Area shall be liquid and moisture proof and designed for the use intended.

    a. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting.

    b. Provide lighting in the Decontamination Unit as required to supply a minimum 50-foot candle light level.

9. If electrical circuits, machinery, and other electrical systems in or passing though the work area must stay in operation due to health and safety requirements, the following precautions must be taken:

    a. All unprotected cables, except low-voltage (less than 24 volts) communication and control system cables, panel boxes of cables and joints in live conduit that run through the work area shall be covered with three (3) independent layers of six (6) mil fire retardant polyethylene. Each layer shall be individually duct taped and sealed. All three (3) layers of polyethylene sheeting shall be left in place until satisfactory clearance air sampling results have been obtained.

2.04 CLEANING

A. Throughout the construction period, the asbestos abatement contractor shall maintain the building as described in this Section.

1. The asbestos abatement contractor shall prevent building areas other than the Work Area from becoming contaminated with asbestos-containing dust or debris. Should areas outside the Work Area become contaminated with asbestos-containing dust or debris as a consequence of the asbestos abatement contractor's work practices, the asbestos abatement contractor shall be responsible for cleaning these areas in accordance with the procedures appended in Title 15, Chapter 1 of RCNY and NYSDOL ICR56. All costs incurred in cleaning or otherwise decontaminating non-Work Areas and the contents thereof shall be borne by the asbestos abatement contractor at no additional cost to the City.

2. The asbestos abatement contractor shall provide to all personnel and laborers the required equipment and materials needed to maintain the specified standard of cleanliness.

B. General

1. Waste water from asbestos removal operations, including shower water, may be discharged into the public sewer system only after approved filtration is on operation to remove asbestos fibers.

2. Asbestos wastes shall be double bagged in six mil (.006") 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 (NYCDOS) 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 (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 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 twelve 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.

    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 tool, 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, 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.

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 twelve 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.

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.

(2) 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.

B. 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.

C. 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 job 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, & 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-asbestos contaminated waste.

c. Shut down, disconnect, and lock out or tag all electric power to the Work Area so that there is no possibility of its reactivation until after clearance testing of the Work Area.

d. Provide and install decontamination enclosure systems in accordance with Sections 3.01 and 3.02 of this Section.

e. Remove ACM that may be disturbed by the erection of partitions using tent procedures and wet removal methods. Removal shall be limited to a one-foot wide strip running the length/height of the partition.

f. Pre-clean and remove moveable objects from the Work Area. Pre-cleaning shall be accomplished using HEPA-vacuum and wet-cleaning techniques. Store moveable objects at a location determined by the City.

g. Protect carpeting that will remain in the Work Area.

(1) Pre-clean carpeting utilizing wet-cleaning techniques.

(2) Install a minimum of two layers of fire retardant 6-mil reinforced polyethylene sheeting over carpeting.

(3) Place a rigid flooring material, minimum thickness of 3/8-inch, over polyethylene sheeting.

h. Pre-clean all fixed objects to remain within the Work Area using HEPA-vacuum and wet-cleaning techniques.

i. Seal fixed objects with two individual layers, minimum, of 6-mil fire retardant polyethylene sheeting.

j. Pre-clean entire Work Area utilizing HEPA-vacuum and wet-cleaning techniques. Methods of cleaning that raise dust; such as dry sweeping or use of vacuum equipment not equipped with HEPA-filters, is prohibited.

k. Install isolation barriers (i.e., sealing of all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grills, diffusers, and other penetrations within the Work Area) using two layers of 6-mil fire retardant polyethylene sheeting and duct-tape.

l. Construct rigid framework to support Work Area barriers.

(1) Framework shall be constructed using 2-inch by 4-inch wooden or metal studs placed 16 inch on center when existing walls and/or ceiling do not exist for all openings greater than 32 square feet. Framework is not required except where one dimension is one foot or less or the opening will be used as an emergency exit.

(2) Apply a solid construction material, minimum thickness of 3/8-inch to the Work Area side of the framing. In secure interior areas, not subject to access from the public or building occupants, an additional layer of 6-mil fire retardant polyethylene sheeting may be substituted for the rigid construction material.

(3) Caulk all wall, floor, ceiling, and fixture joints to form a leak tight seal.

m. Seal floor drains, sumps, shower tubs, and other collection devices with two layers of 6-mil fire retardant plastic and fire rated plywood, as necessary, and provide a system to collect all water used by the asbestos abatement contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer.

n. Remove ceiling mounted objects not previously sealed that will interfere with removal operations. Mist object and surrounding ACM with amended water prior to removal to minimize fiber dispersal. Clean all moveable objects using HEPA-vacuum and wet-cleaning techniques prior to removal from the Work Area.

o. Fiberglass insulation with intact coverings shall be protected in place during abatement activities. These materials shall be protected with two layers of 6-mil fire retardant polyethylene sheeting as isolation barriers and two additional layers of 6-mil fire retardant polyethylene sheeting serving as primary and secondary surface barriers.

p. Install and initiate operation of AFDs 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 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. Cutting tools (e.g., knife, razor) shall be attached to the work area side of the sheeting for use in the event that the barrier must be cut open to allow egress. Emergency exits shall be secured to prevent access from uncontaminated areas and yet permit emergency exiting. Exits shall be checked daily against exterior blockage or impediments to exiting.

r. Temporary lighting within the Work Area and decontamination system shall be provided as required to achieve minimum illumination levels.

s. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacturer-equipped with HEPA filtered local exhaust ventilation.

t. Prior to being plasticized, the Work Areas shall be cleaned using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall not be used.

u. Plasticize the area after pre-cleaning, using the following procedures.

(1) Cover floors with one layer of 6-mil fire retardant polyethylene sheeting, turning layer a minimum of 6 inches up wall, and seal layer to wall.

(2) Cover walls with one layer of 6-mil fire retardant polyethylene sheeting, overlapping wall layer a minimum of 6 inches, and seal layer to floor layer.

(3) Cover floors with a second layer of 6-mil fire retardant polyethylene sheeting, turning layer a minimum of 12 inches up wall, and seal layer to wall.

(4) Cover walls with a second layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to floor layer.

(5) In areas where demolition is required to access ACM, a layer of fire retardant 6-mil reinforced polyethylene sheeting shall be placed on the floor of the enclosure.

(6) Perform demolition required to access ACM. Debris resulting from demolition activities shall be disposed of as ACM waste as described in this Specification.

(7) Repeat preparation of areas accessed by demolition activities as described above.

v. Suspended ceiling tiles and T-grid components shall remain in place until the preparation of the Work Area below the ceiling tiles are completed and personnel and equipment decontamination enclosures have been constructed.

w. Scaffolds shall be provided for workers engaged in work that cannot safely be performed from the ground or other solid Work Area surface.

x. Means of egress shall not be obstructed by hardwall barriers.

y. Pre-Removal Inspections.

(1) Prior to removal of any ACM, the asbestos abatement contractor shall notify the Third-Party Air Monitor and request a pre-removal inspection. Posting of warning signs, building of decontamination enclosure systems, and all other preparatory steps have been taken prior to notification of the Third-Party Air Monitor.

(2) Asbestos abatement contractor shall correct any deficiencies observed by Third-Party Air Monitor at no additional cost to City.

(3) Following the Third-Party Air Monitor's approval of the Work Area preparations, removal of ACM may commence.

2. Removal of ACM Within Full Containment:

a. Mist material with amended water. Allow sufficient time for the amended water to penetrate the material to be removed.

b. Remove the material using hand tools such as scrapers or putty knives. Wire-mesh or wood lathe reinforcing, when present, shall be cut into manageable pieces and disposed of as ACM.

c. Remove any residual material from the substrate using wet cleaning methods and nylon-bristled hand brushes.

d. Place the removal material immediately into a properly labeled fire retardant 6-mil polyethylene bag. All material shall be properly containerized and decontaminated prior to removal from the Work Area.

e. Following the completion of removal of insulation, all visible residue shall be removed from the substrate.

3. Following Removal of ACM utilizing Full Containment Procedures:

a. First Cleaning:

(1) Remove any visible accumulation of asbestos material and debris. HEPA-vacuuming and wet cleaning shall be performed on all surfaces inside the Work Area. All sealed drums, plastic bags, and equipment used in the Work Area shall be removed from the Work Area.

(2) Upon request of the asbestos abatement contractor, the Third-Party Air Monitor will perform a visual inspection. Evidence of asbestos contamination identified during the inspection will necessitate further cleaning as heretofore specified.

(3) Remove first layer of plastic sheathing inside the Work Area. The isolation barriers and decontamination facility shall remain in place and be utilized.

b. Second Cleaning:

(1) After the first cleaning, the Work Area shall be vacated for twelve hours to allow fibers to settle.

(2) All objects and surfaces in the Work Area shall be HEPA - vacuumed and wet cleaned for a second cleaning.

(3) A thin coat of lockdown encapsulant shall be applied to all plastic covered surfaces in the Work Area.

(4) When the encapsulant is dry, second layer of polyethylene sheeting on the walls, ceiling and floors shall be removed. Do not remove seals from doors, windows, Isolation Barriers or disconnect the negative pressure equipment.

c. Third Cleaning:

(1) A minimum of four hours after the second cleaning, all the

surfaces in the Work Area shall be HEPA-vacuumed and wet cleaned for a third cleaning.

(2) Upon the request of the asbestos abatement contractor, the Third-Party Air Monitor will do final visual inspection for re-occupancy. Evidence of asbestos contamination identified during the inspection will necessitate further cleaning as heretofore specified.

(3) When the Work Area passes the Third-Party Air Monitor's visual re-occupancy inspection, air sampling shall not begin until at least one hour after the completion of the third cleaning. The Third-Party Air Monitor shall perform air monitoring using aggressive testing techniques. The Third-Party Air Monitor will approve re-occupancy if the specified fiber count in the Work Area is achieved according to the Third-Party Air Monitor.

(4) When the Work Area passes the re-occupancy test, all controls and seals established shall be removed.

(5) The cleaned layer of the surface barriers shall be removed from walls and floors.

(6) The isolation barriers shall remain in place throughout cleanup. Decontamination enclosure systems shall remain in place and be utilized. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

d. Final Barrier Removal:

(1) Upon receipt of acceptable clearance testing results, polyethylene sheeting and Isolation Barriers shall be removed and disposed accordingly as asbestos-containing material.

(2) The area surrounding the abatement work place shall be cleaned of any visible debris utilizing HEPA vacuum and wet methods.

e. The Third-Party Air Monitor will conduct a final visual observation. Approval must be granted prior to break down of decontamination facility and asbestos abatement contractor demobilization.

C. 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 Commissioner 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

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 registered hazardous 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.

6.01 ACCEPTANCE

Upon satisfactory completion of all decontamination procedures, a certificate will be issued by the Construction Project Manager with copies to all parties.

A. A letter of Compliance stating that all the work on the project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations.

B. All warranties as stated in the Specifications.

END OF SECTION 02 82 13

SECTION 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. Except for that specifically excluded below, furnish and combine materials for all the Work indicated on the Drawings or herein specified to be of plain or reinforced concrete, its installation with forms and reinforcement, and its curing and finishing. Shop Drawings, tools, ways, apparatus, and equipment necessary for concrete production, installation, and finish are included. The Work under this Section includes, but is not limited to, the following:
   1. Slabs on metal deck.
   2. Furnishing and installing joint fillers, dams, and similar items required in conjunction with the concrete Work.
   3. Installing items furnished by other trades and required to be built into the concrete Work.
   4. Grouting railing post base plates.
   5. Installing embedded steel anchorages for the attachment of structural steel.
   6. All other items of concrete and related Work shown on the Drawings specified herein, or needed to make the Work of this Section complete.

B. The following are excluded from the Work specified in this Section:
   1. Furnishing of certain metal inserts and other embedded items installed under this Section but supplied by other trades, including, but not limited to, stone masonry anchors.
   2. Inserts and pipe sleeves for mechanical trades to be furnished and installed by Mechanical trade.

C. Specification Sections that directly relate to the Work of this Section include, but are not limited to, the following:
   1. Section 05 12 00 – Structural Steel Framing.

D. Notify all other trades responsible for installing inserts, sleeves, etc., when ready for such installation and for final checking immediately before concrete is placed. Cooperate with such trades to obtain proper installation. Leave openings in walls for pipe, ducts, etc., for mechanical and electrical Work as shown on Drawings or required by layout of systems.

1.3 REFERENCED STANDARDS

A. Follow the guidelines contained in the latest editions of the following Codes, Specifications, and Standards, including references contained in each Document, except where more-stringent requirements are shown or specified.

B. American Association of State Highway and Transportation Officials (AASHTO).
   1. AASHTO T260 – Standard Method of Test for Sampling and Testing for Total Chloride Ion in Concrete and Concrete Raw Materials.

C. American Concrete Institute (ACI).
   1. ACI 117 – Specifications for Tolerances for Concrete Construction and Materials.
   2. ACI 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
   3. ACI 211.2 – Standard Practice for Selecting Proportions for Structural Lightweight Concrete.
   4. ACI 214 – Guide to Evaluation of Strength Test Results of Concrete.
   5. ACI 301 – Specifications for Structural Concrete for Buildings.
   6. ACI 302.1R – Guide for Concrete Floor and Slab Construction.
   7. ACI 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete.
   8. ACI 305R – Guide to Hot Weather Concreting.
   9. ACI 305.1 – Specification for Hot Weather Concreting.
   10. ACI 306R – Guide to Cold Weather Concreting.
   11. ACI 306.1 –Specification for Cold Weather Concreting.
   12. ACI 308R – Guide to External Curing of Concrete.
   13. ACI 309R – Guide for Consolidation of Concrete.
   14. ACI 311.4R – Guide for Concrete Inspection.
   15. ACI 315 – Details and Detailing of Concrete Reinforcement.
   16. ACI 318 – Building Code Requirements for Reinforced Concrete.
   17. ACI 347 – Guide to Formwork for Concrete.
   18. ACI 613 – Recommended Practice for Selecting Proportions for Concrete.

D. ASTM International (ASTM).
   1. ASTM C31 – Standard Method of Making and Curing Concrete Test Specimens in the Field.
   2. ASTM C33 – Standard Specification for Concrete Aggregates.
   3. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   4. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
   5. ASTM C143 – Standard Method of Test for Slump of Hydraulic-Cement Concrete.
   6. ASTM C150 – Standard Specification for Portland Cement.
   7. ASTM C173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
   8. ASTM C192 – Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
   9. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
   10. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
   11. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
   12. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.
   13. ASTM C595 – Standard Specification for Blended Hydraulic Cement.
   14. ASTM E329 – Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

E. National Ready Mixed Concrete Association (NRMCA).
   1. NRMCA Checklist for Certification of Ready Mixed Concrete Production Facilities.

F. Concrete Reinforcing Steel Institute (CRSI).
   1. Manual of Standard Practice.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 SUBMITTALS

A. General.
   1. Submittals and their schedule submission will be made in compliance with the DDC General Conditions.
   2. Review of Submittals is of a general nature only, and the responsibility for conformance with intent of Drawings will remain with the Contractor. Review does not imply or state that the Fabricator has correctly interpreted the Construction Documents.

B. Submit the following action Submittals for review and approval:
   1. Concrete mix design for each type of concrete. The Contractor will warrant by the submission of the design mixes that such mixes are totally representative of the concrete that it intends to supply to meet the requirements of the Contract Documents. Submit new design mixes for review and approval when any change in materials is required or needed. Include the following information for each concrete mix design:
      a. Method used to determine the proposed mix design.
      b. Compressive Strength at Seven and Twenty-Eight Days. Submit strength test records, mix design materials, conditions, and proportions for concrete used for record of tests, standard deviation calculation, and determination of required average compressive strength.
      c. Gradation of Fine and Coarse Aggregates. Testing data confirming proposed coarse aggregate meets ASTM C33 class designation. Include ASTM test results for aggregates subject to freeze-thaw environment.
      d. Proportions of all ingredients, including all admixtures to be added either at the time of batching or at the job site.
      e. Water-to-cement ratio.
      f. Placement method, including any hot or cold weather procedures.
      g. Slump tested in accordance with ASTM C143.
      h. Air content of freshly mixed concrete by the pressure method, ASTM C231, or the volumetric method, ASTM C173.
      i. Unit weight of concrete, ASTM C138.
      j. Mill test reports of fly ash chemical and physical analysis and certification of compliance with ASTM C618, Class C or F, if used.
      k. Manufacturer's Specification Data Sheets of each concrete admixture, including brand name, Manufacturer, and dosage rate range.
   2. Shop Drawings for reinforcement detailing, fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 – Manual of Standard Practice for Detailing Reinforced Concrete Structures showing bar schedules, stirrup spacing, bent bar diagrams, and arrangement of concrete reinforcement. Include special reinforcing required for openings through concrete structures.

3. Product Data for materials and items, including reinforcement and forming accessories, admixtures, patching compounds, curing compounds, and others if requested by the Commissioner.
4. Proposed methods for finishing of concrete flatwork.
5. Proposed methods for curing cast-in-place concrete.

C. Submit the following informational Submittals for record:
1. Safety Data Sheets for each concrete admixture.
2. Proposed Schedule of Concrete Placement. Keep a permanent log of the dates and times of concrete placement and where on the Project the concrete was cast. This Log will be made available to the Commissioner for inspection upon request.
3. Tickets for each batch of concrete delivered to the jobsite containing the following information:
   a. The mix design identification.
   b. The compressive strength of the concrete being delivered.
   c. The volume of concrete in the delivery truck.
   d. The time the concrete was batched (i.e., the time that water was discharged into the delivery truck to mix with the cement and aggregates).
   e. List of admixtures and dosage rates.
   f. Slump of concrete as placed at the point of deposit in the Work.
   g. Permissible and actual volume of water added to the delivery truck after initial batching.
   h. Location where the concrete is being placed (e.g., foundation walls along Grid Line A, between Grids 1 and 4).
   i. If, upon reaching the jobsite, the concrete cannot be placed within the time limits stated below, or if the type of concrete delivered is incorrect, the Testing Laboratory will reject the load.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Installer's Qualifications. Concrete Work will be done under the supervision of an experienced concrete Installer having Installer experience with "Cast-in-Place" concrete, similar to that used on this Project.

C. Perform all Work in strict accordance with all applicable laws and regulations of the current edition of the New York City Building Code and with the New York City Department of Buildings. All such requirements will take precedence over the requirements of the Specifications except in cases where the requirements of the Specifications are more exacting or stringent.

D. Concrete Mix Design. The Contractor will employ an independent Testing Laboratory, acceptable to the City of New York, to perform material evaluation tests and to design concrete mixes or, when acceptable to the Commissioner, provide copies of recently made material tests and mix designs.
1. If, at any time during construction, the concrete resulting from the approved mix design deviates from Specification requirements, the Contractor will have its laboratory modify the design, subject to approval, until the specified concrete is obtained.

E. Testing of materials and inspections of installed Work will be completed throughout the duration of the Project, as directed by the Commissioner. Provide free and safe access to material stockpiles and facilities for Inspectors.

1. Retesting of rejected materials or reinspection of deficient Work, will be done at the Contractor's expense.

F. The Contractor is responsible for correction of concrete Work that does not conform to the specified requirements, including strength, mix proportions, air void system, tolerances, and finishes. Correct deficient concrete as directed by the Commissioner.

G. All finishing Crew members will be ACI Certified Concrete Flatwork Technicians and Finishers. The Supervisor will be an ACI Certified Flatwork Technician and will have input to the crew's placement and finishing procedures regarding the application of ACI Standards for quality flatwork. The ACI Standards that will be observed are contained in the ACI – Concrete Craftsman Series.

H. The Commissioner will reject cast-in-place concrete that exhibits the following defects:
1. Bulging. Concrete surfaces that bulge due to insufficiently secured formwork, undersized ties, or flat bar clamps.
2. Wavy Concrete. Concrete surfaces that exhibit waves along plywood joints due to moisture migration into unsealed cuts of plywood sheets, causing swellings.
3. Spalling. Concrete spalling due to shale, alkali reactivity, rusting steel too close to the surface, carbonation, improper removal of formwork, expansion of cast-in steel during the welding process, or other reasons.
4. Cracking and Crazing. Concrete cracking and crazing due to lack of control joints or high water-to-cement ratio above 0.50.
5. Air Holes. Air holes resulting from improper vibration and excessive heights of individual layers of pours between vibrations. Air holes due to spreading of concrete with vibrators rather than moving buckets or hoses.
6. Honeycombing. Concrete honeycombing, including loss of fines from leaking formwork or other causes.
7. Discoloration. Concrete discoloration caused by any reason, including inconsistent concrete mix, different sources of cement and aggregates, temperature variation between individual pour and curing phases, improper and inconsistent use of vibrators, variation of time span of concrete in formwork, form oils, and migration of plasticizer into concrete from exposed sealant beads on formwork and around cast-in items such as electrical outlet boxes.
8. Visible Pour Joints. Visible pour joints in concrete resulting from leaking formwork due to lack of gaskets and insufficient overlap with old concrete preventing proper tightening of formwork. Placement of concrete layers in excessive heights and spreading concrete with vibrator.
9. Debris in Concrete. Concrete that includes debris, whether caused by insufficient cleaning of formwork or lack of cleanout and access doors at base of formwork.

I. Schedule a concrete preconstruction meeting at least thirty (30) days prior to placement of any concrete. Attendance at the meeting will include Ready Mix Supplier, Concrete Pumping Subcontractor, Field Testing Laboratory, and the Commissioner. The agenda of the meeting will be prepared by the Contractor and will include, but not be limited, to the following:
1. Review of concrete mix designs.
2. Field testing and quality control.
3. Concrete placing sequence and schedule.
4. Formwork, shoring, reshoring, and stripping.
5. Placing, jointing, and finishing procedures.
6. Cold-weather and hot-weather concreting procedures.

7. Steel reinforcement installation.
8. Curing and protection procedures.

J. Obtain each type or class of cementitious material of the same brand from the same Manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single Manufacturer.
   1. ACI 301 – Specifications for Structural Concrete for Buildings, Sections 1 through 5 and Section 7, Lightweight Concrete.
   2. ACI 117 – Specifications for Tolerances for Concrete Construction and Materials.

K. 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.

L. Conduct a preinstallation conference at Project site to comply with requirements in DDC General Conditions Section "Project Management and Coordination".
   1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      a. Contractor's Superintendent.
      b. Independent Testing Agency responsible for concrete design mixtures.
      c. Ready-mix concrete Manufacturer.
      d. Concrete Subcontractor.
   2. Review Special Inspection and Testing and Inspecting Agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, and concrete protection.

M. The City of New York will employ a Special Inspector to oversee and administer, and an independent Testing Agency(s) to perform, a Program of Structural Tests and Inspections for compliance with Chapter 17 of the New York City Building Code. The Commissioner will submit New York City Department of Buildings TR-1 and TR-2 forms, specifying the tests and inspections to be performed throughout the construction of this Project.
   1. The Special Inspector will organize and direct the test and inspection program. All Inspection and Test Reports will be submitted to the Contractor and the Commissioner. The Contractor will be responsible for understanding the test and inspection program and notifying the Testing Agency and the Special Inspector when Work is ready for tests and/or Inspections. The Contractor will provide access to the Testing Agency, Special Inspector, and the Commissioner. Inspections and tests of the Structural Tests and Inspection Program will not relieve the Contractor of responsibility for supervision, testing, and inspection for quality control of the Work.
   2. The Commissioner will provide Testing and Inspection Reports to the New York City Department of Buildings when requested. Upon completion of the construction, the independent Special Inspector will make a final report on the satisfactory completion of the Program of Structural Tests and Inspections to the building official and to the Commissioner.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Reinforcing Bars.
1. "Black" Reinforcement: ASTM A615, Grade 60, deformed.

B. Deformed-Steel Welded Wire Reinforcement. ASTM A497, flat sheet.

2.2 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars. ASTM A615, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs.

B. Bar Supports. Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI Manual of Standard Practice, of greater compressive strength than concrete and as follows:
1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

C. Stitch-Tie Helical Anchors: Subject to compliance with requirements, provide one of the following:
1. Simpson Strong Tie, Heli-Tie Helical Stitching Tie
2. DeWalt, Heli-Pin Helical Tie
3. Prosoco, Helical Stitch-Tie
4. Or approved equal.

D. Mechanical Bar Couplers.
1. Where required, provide mechanical couplers capable of developing 125% of the reinforcing bar yield strength.

2.3 CONCRETE MATERIALS

A. Cementitious Material. Use the following cementitious materials, of the same type, brand, and source, throughout Project:
1. Portland Cement. ASTM C150, Type II.
2. Fly Ash: ASTM C618, Class FC. Maximum mercury content 2 ppb (0.002 mg/l). Fly ash may not be sourced from a coal plant co-fired with hazardous waste, medical waste, or tire-derived fuel, or from a municipal solid waste incinerator.
3. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120. Slag may not be sourced from a plant co-fired with hazardous waste, medical waste, or tire-derived fuel.

4. Silica Fume: ASTM C1240, amorphous silica.

B. Normal-Weight Aggregates. ASTM C33, Class 1S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 3-yrs' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
1. Maximum Coarse-Aggregate Size. 3/4 in. nominal.
2. Fine Aggregate. Free of materials with deleterious reactivity to alkali in cement.

C. Lightweight Aggregate. ASTM C330, 3/4 in. nominal maximum aggregate size.

D. Water. ASTM C94 and potable.

2.4 ADMIXTURES

A. General Admixture Requirements.
1. Concrete supplier and Contractor will use Manufacturer's product identified in this Section.
2. All admixtures used in the concrete will be produced by a single Manufacturer.
3. Concrete supplier and Contractor will certify compatibility of all ingredients in each mix design. Use admixtures in strict accordance with Manufacturer's recommendations.
4. Concrete supplier and Contractor will account for admixture volume in the concrete mix proportions in accordance with admixture Manufacturer's recommendations.
5. Do not use calcium chloride or admixtures containing more than 0.1% chloride ions.

B. Air-Entraining Admixture. ASTM C260, certified by Manufacturer to be compatible with other required admixtures. Subject to compliance with requirements, provide one of the following:
1. Eucon Air-Mix, Euclid Chemical Co.
2. Darex AEA or Daravair, W.R. Grace & Co.
3. MB-VR or Micro-Air, BASF Construction Chemicals.
4. Sika AER, Sika Corp.
5. Or approved equal.

C. Water-Reducing Admixture. ASTM C494, Type A. Subject to compliance with requirements, provide one of following:
1. Eucon WR-75, Euclid Chemical Co.
2. WRDA, W.R. Grace & Co.
3. Pozzolith Normal or Polyheed, BASF Construction Chemicals.
4. Plastocrete 161, Sika Corp.
5. Or approved equal.

2.5 CURING MATERIALS

A. Absorptive Cover. AASHTO M182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz per square yard when dry.

B. Moisture-Retaining Cover. ASTM C171, polyethylene film or white burlap-polyethylene sheet.

C. Water. Potable.

2.6 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips. ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.

B. Bonding Agent. ASTM C1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.7 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or, field test data, or both, according to the New York City Building Code.
   1. Use a qualified independent Testing Agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
   1. Fly Ash: 15% minimum, 25% maximum.
   2. Ground Granulated Blast-Furnace Slag. 25% minimum, 35% maximum.
   3. Combined Fly Ash and Ground Granulated Blast-Furnace Slag. 50% portland cement maximum, with fly ash or pozzolan not exceeding 25%.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06% by weight of cement.

D. Air Content: Measure at point of deposit into the Work. If concrete will be pumped, design mix for air loss due to pumping.

E. Admixtures. Use admixtures according to Manufacturer's written instructions.
   1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.8 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Slabs-on-Metal Deck. Proportion structural lightweight concrete mixture as follows:
   1. Minimum Compressive Strength. 5,000 psi at twenty-eight days.
   2. Maximum Water-to-Cementitious Materials Ratio. 0.4.
   3. Calculated Equilibrium Unit Weight. 115 lb per cubic foot, plus or minus 3 lb per cubic foot, as determined by ASTM C567.
   4. Slump Limit. 8 in. for concrete with verified slump of 2 to 4 in. before adding high-range water-reducing admixture.
   5. Air Content. 6%, plus or minus 1.5% at point of delivery for 3/4 in. nominal maximum aggregate size.
   6. Air Content – Trowel Finish. Do not allow content of trowel-finished floors to exceed 3%.

2.9 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI Manual of Standard Practice.

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete. Measure, batch, mix, and deliver concrete according to ASTM C94/C94M and ASTM C1116, and furnish batch ticket information.
   1. When air temperature is between 85°F and 90°F, reduce mixing and delivery time from 1-1/2 hrs to 75 min.; when air temperature is above 90°F, reduce mixing and delivery time to 60 min.

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, floor drains, and other related materials with placement of forms and reinforcing steel.

3.3 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
   1. Class A, 1/8 in. for smooth-formed finished surfaces.
   2. Class B, 1/4 in. for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to Manufacturer's written instructions, before placing reinforcement.

3.4 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete. Use setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC Code of Standard Practice for Steel Buildings and Bridges.

3.5 REMOVING AND REUSING FORMS

A. General. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50°F for 24 hrs after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
   1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved its twenty-eight-day design compressive strength.
   2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Commissioner.

3.6 STEEL REINFORCEMENT

A. General. Comply with CRSI Manual of Standard Practice for placing reinforcement.
   1. Do not cut or puncture vapor retarder or waterproofing membrane. Repair damage and reseal vapor retarder or waterproofing membrane before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 in. into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. For unshored slabs on composite metal deck, place slabs to constant elevation. Metal floor deck is designed for unshored two span conditions. Single span conditions may require shoring.
   3. Maintain reinforcement in position on chairs during concrete placement.
   4. Screed slab surfaces with a straightedge and strike off to correct elevations.
   5. Slope surfaces uniformly to drains where required.
   6. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement. Comply with ACI 306.1 and as follows. Protect concrete Work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When average high and low temperature is expected to fall below 40°F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
   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. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement. Comply with ACI 301 and as follows:
   1. Maintain concrete temperature below 90°F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
   2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FLOORS AND SLABS

A. General. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish. Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
   1. Apply float finish to surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

C. Broom Finish. Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
   1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Commissioner before application.

3.9 MISCELLANEOUS CONCRETE ITEMS

A. Filling In. Fill in holes and openings left in concrete structures, unless otherwise indicated, after Work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.10 CONCRETE PROTECTING AND CURING

A. General. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Formed Surfaces. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

C. Unformed Surfaces. Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
   1. Moisture Curing. Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12 in. lap over adjacent absorptive covers.

3.11 JOINT FILLING

A. Prepare, clean, and install joint filler according to Manufacturer's written instructions.
   1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 in. deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.12 CONCRETE SURFACE REPAIRS

A. Defective Concrete. Repair and patch defective areas when approved by Commissioner. Remove and replace concrete that cannot be repaired and patched to Commissioner's approval.

B. Patching Mortar. Mix dry-pack patching mortar, consisting of one part portland cement to two-and-one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins, and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
   1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 in. in any dimension in solid concrete, but not less than 1 in. in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
   2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at

inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Commissioner.

D. Repairing Unformed Surfaces. Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 in. wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least fourteen days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to Manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 in. to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to Manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 in. or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4 in. clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 in. or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hrs.

E. Repair materials and installation not specified above may be used, subject to Commissioner's approval.

3.13 QUALITY CONTROL

A. Testing and Inspecting. The City of New York will engage a Special Inspector and qualified Testing and Inspecting Agency to perform field tests and inspections per the New York City Building Code and prepare test reports.

B. Inspections. Special Inspector to comply with all requirements of the Concrete Cast-in-Place, Concrete Test Cylinders, and Concrete Mix Design Special Inspections per the New York City Building Code, including, but not limited to:

1. Steel reinforcement placement.
2. Verification of use of required design mixture.

3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.

C. Concrete Tests. Testing of composite samples of fresh concrete obtained according to ASTM C172 will be performed according to the following requirements:
   1. Testing Frequency. Obtain at least one composite sample for each 100 cu yd or fraction thereof of each concrete mixture placed each day.
      a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing will be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
   2. Slump. ASTM C143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
   3. Air Content. ASTM C231, pressure method, for normal-weight concrete; ASTM C173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   4. Concrete Temperature. ASTM C1064; one test hourly when air temperature is 40°F and below and when 80°F and above, and one test for each composite sample.
   5. Unit Weight. ASTM C567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   6. Compression Test Specimens. ASTM C31.
      a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
   7. Compressive-Strength Tests. ASTM C39; test one set of two laboratory-cured specimens at seven days and one set of two specimens at twenty-eight days.
      a. Test one set of two field-cured specimens at seven days and one set of two specimens at twenty-eight days.
      b. A compressive-strength test will be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
   8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
   9. Test results will be reported in writing to Commissioner, concrete Manufacturer, and Contractor within 48 hrs of testing. Reports of compressive-strength tests will contain Project identification name and number, date of concrete placement, name of concrete Testing and Inspecting Agency, location of concrete batch in Work, design compressive strength at twenty-eight days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both seven- and twenty-eight-day tests.
   10. Nondestructive Testing. Impact hammer, sonoscope, or other nondestructive device may be permitted by Commissioner but will not be used as sole basis for approval or rejection of concrete.
   11. Additional Tests. Testing and Inspecting Agency will make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Commissioner. Testing and Inspecting Agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42 or by other methods as directed by Commissioner.
   12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional Work with specified requirements.
   13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Measure floor and slab flatness and levelness according to ASTM E1155 within 24 hrs of finishing.

END OF SECTION 03 30 00

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. For all Work described, supply and install the following components and their subcomponents of the Work required to provide a complete system, including but not limited to the following:
   1. Exterior brick masonry repointing.
   2. Exterior brick masonry crack restoration.
   3. Exterior brick unit replacement.

1.3 RELATED SECTIONS

A. Related Sections of the Specifications for coordination include, but are not limited to, the following:
   1. Section 07 62 00 – Sheet Metal Flashing and Trim.
   2. Section 07 92 00 –Joint Sealants.

1.4 REFERENCE STANDARDS AND REGULATIONS

A. Comply with all New York City Construction codes listed below and obtain all necessary approvals from the New York City Department of Buildings. Where their recommendations or requirements are to a lower standard than required by this Contract Document, this Document will take precedence. Local codes include the following with the most recent amendments and their references:
   1. The New York City Building Code.

B. Comply with the applicable provisions and recommendations of the standards listed below. Where standards conflict or conflict with the provisions of these Specifications, the more stringent will apply. Unless otherwise noted, the latest editions of the standards will apply:
   1. Brick Industry Association (BIA)
      a. Technical Notes.
   2. American Concrete Institute (ACI)
      a. ACI 530 – Building Code Requirements and Specification for Masonry Structures.
   3. ASTM International (ASTM)
      a. ASTM C67 – Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
      b. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.
      c. ASTM C150 – Standard Specification for Portland Cement.
      d. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes.

e. ASTM C216 – Standard Specification for Facing Brick.
f. ASTM C270 – Standard Specification for Mortar for Unit Masonry.
g. ASTM C780 – Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
h. ASTM C1180 – Standard Terminology of Mortar and Grout for Unit Masonry.
i. ASTM C1232 – Standard Terminology of Masonry.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance Requirements.
1. For all elements, use materials suitable for external conditions that will not deteriorate as a result of weathering.
2. Use materials in the Work that are chemically compatible with their adjacent materials.
3. All external areas of the Work will be accessible for maintenance and repair.
4. Comply with performance requirements specified and as validated by mockup testing described in Related Sections.
5. Work will:
a. Withstand the specified deleterious and degrading effects of radiation from the sun, weathering, atmospheric pollution, cleaning agents, vermin, fungi, and other growths for the required service life without maintenance in excess of routine cleaning and minor repairs.
b. Have a resistance to combustion and fire spread appropriate to each part.

B. Durability Performance.
1. Provide materials that will not be damaged by freeze-thaw cycling according to ASTM C216, Grade SW.
2. Infestation: Materials used in the Work will be resistant to attack or infestation by microorganisms, fungi, insects, or other vermin.
3. The Contractor will avoid, in its engineering and detailing, introducing locked-in stresses that may be detrimental to the performance of the Work during the service life.

C. Weatherproofing Performance.
1. The Work, including all weatherproof joints between it and other elements of Work, will prevent leakage of water into the interior of the building from the weathering line of the assembly under the action of wind pressure, kinetic energy, gravity, surface tension, or capillary action as per the New York City Building Code. It will also prevent water entering into those parts of the Work that would be adversely affected by the presence of water.
2. All weatherproof joints within the Work will maintain their watertightness under the loads and movements specified herein.
3. Detailing and waterproofing must ensure that water from ponding or reservoirs is directed away from the Work such that water will not build up a pressure head or impose forces onto the building enclosure seals and components.

D. Failure includes inability of the Work to meet the performance requirements set forth in this and all Related Sections, in addition to the following:
1. Staining of adjacent components or wetting of interior building components.
2. Premature deterioration of installed materials.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all Submittals.

1.7 ACTION SUBMITTALS

A. Submit action Submittals in time to allow for review by the Commissioner and for resubmittals, if needed, without delaying the Work. Contractor is to anticipate the need for resubmittals or additional Submittals to address the Commissioner's comments and, show full compliance with the requirements of the Project Documents and New York City Construction Codes in its schedule, and provide additional time in its schedule to accommodate these requirements. Action Submittals include product data, calculations, graphical information, and physical Samples requiring Commissioner's responsive action. Do not order materials or start Work before receiving the Commissioner's written approval or review confirmation.

B. Provide Submittals for review in a complete and orderly process.
   1. Properly label and reference all Submittals to the appropriate Specification subparagraph.
   2. Provide complete sets of product data for submission with Shop Drawings and calculation Submittals.
   3. Respond to all of the Commissioner's comments on resubmittals.

C. Shop Drawings.
   1. Submit Shop Drawings based on compliant solutions, Samples, and other supporting evidence.
   2. Contractor is to field-verify all masonry repointing, crack restoration, and spall restoration locations on the Project and show the locations of Work on elevation Shop Drawings.
      a. For Work, include plans, elevations, sections, full-size details, and attachments to other Work. Submit details for all typical and non-typical conditions.
         1) Submit Drawing list with detailed description of the Drawings included on the individual sheets.
         2) Drawings will illustrate the complete design, including but not limited to supporting elements, fasteners, and fixings. Show sequencing, shape, and layering of all elements.
            a) Show all finishes, sealants, and primers on Shop Drawings, identified by product name and color.
         3) Identify materials to be incorporated in the Work, dimensions, thickness of each material and system, and relationships to adjacent construction. Show integration with all adjacent building enclosure systems.
            a) Identify adjacent building enclosure systems or "Work by others" using halftone or a different color.
         4) Provide axonometric Drawings of special conditions and of areas requested by the Commissioner to clarify the design.
            a) Provide where section and plan details do not illustrate the full scope of Work of the intended installation.
         5) Clearly identify all changes in resubmissions.
         6) Date and identify each Shop Drawing issue and identify each Shop Drawing sheet by the same Drawing number / name throughout the duration of the Project.
      b. Approval of Shop Drawings is for size and arrangement of principal and auxiliary components. Approval does not relieve the Contractor's responsibility for dimensions, fabrications, and correct fitting of system components.

c. Manufacturer's standard details, industry standards, and details or photocopies of the Construction Documents are not acceptable for Shop Drawings. Shop Drawings are to be wholly created by the Contractor.

3. Coordination Drawings
   a. Prepare Coordination Drawings at the interfaces between different systems.
   b. Prepare Coordination Drawings where careful coordination is needed for installation of products and materials fabricated by separate entities.
   c. Prepare Coordination Drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.
   d. Show the relationship of components shown on separate Shop Drawings.
   e. Indicate required installation sequences.
   f. Comply with requirements contained in Related Sections.
4. Submit Drawings in no more than two batches per system. Provide data sheets for initial system submissions.

D. Product Data.
1. Manufacturer's technical and installation literature for all materials specified or proposed in this Section for use on the Project.
2. Provide documentation from the different material and system Manufacturers showing that all materials are compatible with all other materials with which they come into contact at the Project or recommendations to provide separation between non-compatible materials.
   a. Provide test reports showing that the materials and systems meet the performance criteria established by these Specifications.
   b. Test results or certifications that brick complies with reference standards.
3. Mix Designs: Prior to delivery, submit proposed mortar mix designs in compliance with the applicable Specifications referenced herein for the Commissioner's review and approval.
   a. Sieve, iron, and chloride analysis of proposed sand.
   b. Hydrated lime.
   c. Portland cement.
   d. Patching mortars.

E. Samples.
1. Brick: Provide four brick samples, each in all colors selected by the Commissioner for replacement brick to match existing on the building.
2. Repointing Mortar
   a. Brick Repointing Mortar: Provide three 12 in. x 1/2 in. x 1/2 in. units of cured mortar.
   b. Granite Repointing Mortar: Provide three 12 in. x 1/2 in. x 1/2 in. units of cured mortar.
3. Spall and Crack Patching Mortar: Submit three 6 in. x 6 in. x 1 in. samples of all intended patching mortars.

1.8 CLOSEOUT SUBMITTALS

A. As-Built Drawings: Provide Drawings meeting the requirements of Shop Drawings that show the as-built condition.

1.9 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Pre-Installation Conference.
1. Conduct conference at Project site at least two (2) weeks prior to scheduled commencement of Work installation. Include installers of other Work in and around the windows that must precede or follow the window installation, including subcontractors from other trades, the Commissioner, City of New York, Manufacturers of products involved in installation, and inspectors.
2. Review methods and procedures related to Work.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review required testing, inspecting, and certifying procedures.
5. Review temporary protection requirements for fragile materials during and after installation.

C. Certification of Materials: Prior to commencement of installation, obtain certification from the Manufacturer of each material that the material is of the correct strength, size, grade, etc. Provide copies of all such certification to the Commissioner for inspection.

D. Availability of Shop Drawings: Provide a copy of all applicable Drawings, including Shop Drawings and Specifications, at the site during all Work covered under this.

E. Notification: Notify the Commissioner in writing at least 72 hrs prior to the initial installation of the Work.

F. Review of Work.
1. Promptly provide site access to Commissioner and Manufacturers for review of the Work as requested by the Commissioner.

G. Rejection of Damaged / Non-Compliant Work.
1. Damaged materials or Work that does not comply with the requirements of the Project Documents will be rejected.
2. Rejected materials or Work must be immediately removed and replaced with new materials at no additional cost to the City of New York.

H. Historic Treatment Specialist Qualifications: A historic masonry specialist meeting the requirement of DDC General Conditions Section 014000 1.7/C/6.

1.10 PROJECT CONDITIONS

A. Protection.
1. Protect the building, its contents, and new and existing Work against damage from the Work of this Section. Notify the Commissioner immediately if anyone abuses or damages completed Work.
2. Protect new and existing masonry from damage. Repair or replace masonry damaged during construction at no additional cost to the City of New York. The Commissioner will determine if damaged masonry must be replaced with new or salvaged units or if repairs are appropriate.
3. Do not damage existing materials scheduled to remain or newly-installed materials. Provide adequate protection of the window glass to prevent breakage, scratches, staining, etc.

B. Environmental Requirements.
   1. Schedule and execute all Work to avoid exposing the building and its contents to inclement weather. Prevent water intrusion with temporary protection.
   2. Cold Weather: Do not Work in temperatures below 35°F, and only Work between 35°F and 45°F when proper provisions are made to protect the Work from freezing for not less than 48 hrs after installation. Use enclosures as required.
   3. Hot Weather (above 80°F): Protect the masonry and mortar from direct sunlight and exposure to wind, to avoid rapid evaporation of water in the mortar before, during, and after masonry construction.

C. Field Measurements: Verify all dimensions by field measurement.

D. Schedule Requirements.
   1. Provide proposed progress schedule, including mockup, delivery, and Submittal lead times, Work sequencing, staging requirements, and estimated duration of sequential Work activities. Update schedule weekly to reflect actual progress and modifications in the Work process.

E. Work only in areas permitted by the approved schedule.

1.11 COORDINATION AND SEQUENCING

A. Refer to these Specifications to determine the type and extent of Work therein affecting the Work of this trade, whether or not such Work is specifically mentioned.

B. Work in cooperation with other trades to complete Work in a timely manner, including temporary protection, as required. Coordinate with other trades to minimize disruption to the building occupants, maintain accessibility of building entrances, and prevent leakage to the interior.

C. Coordinate construction operations included in various Sections of these Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in the sequence required 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 accessibility for required maintenance, service, and repair.
   3. Make provisions to accommodate items scheduled for later installation.

D. Where necessary, prepare memoranda for distribution to each party involved to coordinate all procedures. Include such items as required notices, reports, and attendance at meetings.
   1. Prepare similar memoranda for the Commissioner and separate Subcontractors where coordination of their Work is required.

E. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of Submittals.

4. Progress meetings.
5. Project closeout activities.

F. Conservation: Coordinate construction operations to ensure operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.
2. Maintain egress paths throughout construction period.

1.12 MOCKUPS

A. Mockups: Construct the following mockups on site for review and approval by Commissioner prior to beginning Work.
1. Mockups will be constructed on the building in area(s) designated by the Commissioner and accessible from grade without ladders, Work platforms, or scaffolding.
2. Notify the Commissioner at least seven days before construction of the sample so that the Commissioner is present during the construction of the sample.
3. See below for execution requirements for masonry restoration to be included with the mockups.
4. Reproduce the approved construction procedures, workmanship quality and appearances throughout the Project using identical materials, mixtures, and quality of workmanship.
5. Keep approved mockups areas in a cleaned and finished condition throughout the duration of the Project.
6. Repointing Mortar.
   a. Brick: Mockup 10 sq ft of pointing mortar in brick masonry.
7. Brick Replacement: Mockup replacement of two brick masonry units.
8. Spall Restoration: Mockup one 4 in. x 4 in. spall restoration area.

1.13 DELIVERY, STORAGE, AND HANDLING

A. All materials will be stored in their original tightly-sealed containers or unopened packages and will be clearly labeled with the Manufacturers' brand name, batch number, and expiration date, where appropriate.

B. Materials will be stored in a neat and safe manner so as not to exceed the allowable live load of the storage area.

C. Materials will be stored out of the weather in clean and dry areas on pallets, protected from sunlight.

D. Materials, including liquids such as adhesives, thinners, and primers, will be stored in areas away from sparks, open flames, and excessive heat and in a dry condition.

E. Comply with the Manufacturer's instructions for storage.

PART 2 - PRODUCTS

2.1 BRICK MASONRY UNITS

A. Face Brick: ASTM C216, Grade SW, Type FBS without frogs and as follows:

1.

	Brick Average	Individual
a. Compressive Strength (minimum)	3,000 psi	2,500 psi
b. 24-hr Cold Water Absorption (maximum)	13.2%	16.0%
c. 5-hr Boil Absorption (maximum)	17.0%	20.0%
d. Saturation Coefficient (maximum)	0.78	0.80
e. Initial Rate of Absorption (suction): 5 to 25 g per minute per 30 sq. in.		
f. Efflorescence: Provide brick that has been tested according to ASTM C67 and is rated "not effloresced."		
g. Provide face brick matching color range, texture, and size of existing adjacent brickwork.		
h. No bricks will contain chipping greater than the limits in ASTM C216, Table 3.		

2.2 MASONRY MORTARS

A. Mortar Constituents.
   1. Masons Sand: ASTM C144 – Standard Specification for Aggregate for Masonry Mortar, fineness modulus 2.0 to 2.5, color as required to achieve the Commissioner's approved mortar color.
      a. Sand will not contain ferrous materials.
      b. Sand will not contain chlorides.
      c. The Project requires multiple mortar colors depending on the surrounding existing mortar to remain for each repointing area.
   2. Hydrated Lime: ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes, Type "S" non-air-entrained.
   3. Portland Cement: ASTM C150 – Standard Specification for Portland Cement, Type I, low alkali (equivalent alkalis < 0.6%). Provide white or light gray cement for pointing as necessary with selected sand to achieve the Commissioner's approved mortar colors.
      a. The Project requires multiple mortar colors depending on the surrounding existing mortar to remain for each repointing area.
   4. Water: Clean, potable, and free from deleterious amounts of acids, alkalis, or organic materials.
   5. Mortar Coloring Material: Mortar color to be achieved with white and gray cement and sand color only. Pigments to achieve color are not allowed.
   6. Masonry cements, gypsum portland cements, or blended cements will not be allowed.
   7. Admixtures
      a. No calcium chloride or admixtures containing calcium chloride will be used in the mortar.
      b. No air-entraining admixtures or material containing air-entraining admixtures will be used in mortar.
      c. No antifreeze compounds or other substances will be added to mortar.
      d. No corrosion-promoting admixtures will be used in the mortar.
      e. No admixtures will be used without written approval.

B. Masonry Repointing Mortar: ASTM C270, Type N. Proportions by volume 1:1:6 (portland cement : hydrated lime : mason's sand), or as necessary to achieve required mortar color. Do not use ground limestone.
   1. Prepared mortar mixes ("bag mix") can be used but only if the constituent components meet the individual requirements noted above, including matching the color of the surrounding existing mortar to remain.

2.3 ACCESSORIES

A. Cleaning Compound for masonry restoration Work: Water and a stiff bristle brush with cleaning compound approved by the Commissioner. Do not use cleaning compounds containing acids.

B. See Article 3.7 for additional Project masonry cleaning requirements.

C. Shims: Nonstaining, hard plastic.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for the requirements governing execution.

3.2 EXAMINATION

A. Examine all surfaces scheduled for masonry restoration for roughness, contaminants, unsound structural substrates, or other conditions that may impair the application. Notify the Commissioner in writing of any such conditions; do not commence Work until all defects are remedied.

3.3 MASONRY WORKMANSHIP

A. Brick workmanship will comply with all applicable recommendations of the Brick Industry Association, except as modified below.

B. Remove any Work exposed to freezing. Remove any ice and snow from masonry setting bed and dry surface before starting masonry Work. Obtain the Commissioner's prior written approval for the heating methods. Do not use frozen materials in mortar or other masonry Work.

C. Mix mortar using quantity of water to ensure good workability. For each batch, measure cement and lime in bags; sand by weight or measure in suitable calibrated containers free of scaling and corrosion, with allowance made for moisture content, bulking, and consolidation. Do not use split sacks. Do not use shovel measurements of sand, cement, or lime. Keep mortar in metal pans that are free of corrosion. Mix by machine only for at least 3 min. but not more than 5 min. Use mortar within 2 hrs of mixing at temperatures over 74°F and 2-1/2 hrs at temperatures between 50°F and 74°F. Do not re-temper mortar. Discard hardening mortar.

D. Do not use trowels, pointing tools, or other tools or mixing pans that show corrosion.

E. If necessary to cut brick, use a motor-driven saw to obtain true, even, and undamaged edges. Do not use over burned or oil- or grease-marked cut masonry. Do not use bricks with cracks or splits in any face that will be exposed or with chips extending more than 3/8 in. from edges or corners. Do not break bricks with mason's hammer.

F. Lay all masonry plumb and true, with uniform and level joints. Lay out all face coursing and joint widths to match existing. Match the coursing and patterns of existing configurations and approved layouts. Work at scaffold height most conducive to good workmanship; do not perform Work overhead.

G. Strike exterior mortar joints flush during laying. When mortar is thumbprint hard on exposed surfaces, tool joints concave with a pointing tool slightly larger than the joint to compact mortar thoroughly. Size tool to form concave joints to match the existing masonry. Tool head and bed joints in the same sequence as they were tooled in the existing wall. Coordinate Work so as to avoid tooling "fresh" joints at end of day.

H. Do not stain masonry or any other surface with mortar droppings or other substances. Install covering over construction to remain, to protect from mortar and brick droppings.

I. Dry brush newly completed masonry and exposed flashing surfaces daily to clean and remove mortar.

3.4 UNIT MASONRY AND MORTAR REMOVAL

A. Brick Unit Removal.
   1. Remove all cracked or spalled brick units.
   2. Before attempting to remove any masonry, saw cut all mortar joints between masonry units to be removed and units scheduled to remain. Do not saw cut beyond immediate areas of removal. Do not grind off existing mortar substrate surfaces, damage, or chip units of masonry scheduled to remain and units scheduled for salvage and reuse. Do not break bond between mortar and units scheduled to remain or crack any masonry in areas to remain. Use care during removal to minimize the amount of removal and to maximize the reuse of salvaged masonry.
   3. Limit the extent of masonry removal to prevent any adverse effects on the structural soundness or weather-resistant integrity of the existing masonry. Do not remove continuous lengths of masonry coursing longer than 3 ft and as limited by existing conditions. Do not remove intermediate piers until new piers are installed and have cured three days. The Contractor will repair any areas suffering any adverse effects as a result of this Work; repairs will be in accordance with these Specifications and to the satisfaction of the Commissioner. Replace header bricks with false headers. Do not replace more than three header bricks with false headers within a 2 sq ft area without consulting the Commissioner.
   4. Replace any brick or stone units damaged during removal of mortar at no additional cost to the City of New York.

B. Mortar Removal.
   1. Remove all masonry mortar showing friability, gaps between mortar and unit masonry, surface loss, cracks, voids, looseness, or other deterioration.
   2. Carefully remove mortar from the joints in masonry being removed to a depth of at least 1/2 in., but not more than 3/4 in. for brick and 1 in. for stone. Do not grind off existing mortar substrate surfaces, damage, or chip units of masonry scheduled to remain and units scheduled for salvage and reuse. Use saw cutting only to remove mortar from the center of the joint. Use hand chisels to remove mortar in contact with the stone and brick.

a. No mechanical saw cutting of brick and stone head joints within 6 in. of an adjacent course is allowed.

3. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar.
4. Remove all loose mortar from existing masonry at junctions with new masonry and replace.
5. Replace any brick or stone units damaged during removal of mortar at no additional cost to the City of New York.

3.5 BRICK MASONRY INSTALLATION

A. Use one mortar for setting and pointing.

B. Install brick as follows:
1. Determine head joint size/layout before laying brick.
2. Lay bed mortar only a few units ahead of the Work to prevent drying out. Use only soft and plastic mortar. Butter the ends of all masonry units with sufficient mortar so that the buttered face is completely covered with mortar, and some mortar will ooze out on top when the unit is placed. Do not scoop up bed joint mortar on end of brick to form head joint.
3. Bed joints will be beveled per BIA recommendations with the brick then shoved in place.
4. "Roll" brick into place, to reduce amount of mortar oozing from bed joint. Strike bed and head joints on inner face flush with brick surface where accessible, and scoop up excess mortar with trowel or parge across inner face to prevent mortar from falling into cavity.
5. Place bricks with full head joints, each unit pressed down into a full bed of mortar to produce well compacted joints of full width, front to back. Do not slush head joints. Do not furrow bed joints. Fill all joints solidly with mortar.
6. After brick placement, mortar squeezed out of bed joints will be cut off before tooling.
7. Once laid, do not break the bond between mortar and masonry units in any way.
8. Lay all brick masonry dry, unless given written permission by the Commissioner to wet the units.
9. All brick will be laid without disturbing the brick previously laid. Brick will be laid within a minute after the mortar is placed. Dry or butt joints will not be permitted.
10. Fill collar joints completely in multi-wythe barrier walls.
11. Recess shims 1 in. back from the exterior surface of the mortar joint.

3.6 MASONRY REPOINTING

A. Inspection.
1. Inspect all mortar joints to determine those that are deteriorated and failing.
2. Note all areas that will be repointed on building elevations and provide the linear foot quantity of mortar joint repointing to the Commissioner for review.

B. Point joints as follows:
1. Rinse masonry joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water.
2. Paint existing masonry surfaces to receive mortar with neat cement.
3. Pre-hydrate the mortar by making the initial mix stiff, so it will form a ball when shaped in the palm of a hand. Allow the stiff mix to sit for 1 hr; then add additional water and remix.

4. Apply mortar in 1/4 in. thick layers, and compress each layer with an appropriate pointing tool to exclude any voids. Strike off the last layer of mortar flush, and follow the tooling requirements in this Section. Avoid overfilling the joints and producing joints wider than the existing joints.
5. Do not retemper mixes which have begun to stiffen.

3.7 FINAL CLEANING – MASONRY RESTORATION

A. Clean all masonry Work promptly after curing by wetting surfaces and washing with a stiff bristle brush to produce a clean and unmarred appearance. Begin cleaning with clean water only, without chemical cleaners. If water alone with a scrub brush does not produce acceptable aesthetic results, as determined by the Commissioner, use an approved cleaning compound. Dilute the compound with the maximum amount of water that will allow proper cleaning, as approved by the Manufacturer, and the Commissioner.

B. Test the cleaning compound in a small, inconspicuous area before beginning full-scale cleaning. Cover all existing exposed metal, glass, and other areas as required before cleaning the masonry with any cleaning compounds. Do not use metal scrapers to clean the masonry. Rinse repeatedly with clean water after cleaning to remove all traces of mortar and debris. Protect all exterior finishes, including glass, aluminum, and completed metal flashing Work from any damage or staining caused by this Work.

C. Before Substantial Completion of the Work, remove all traces of efflorescence as directed by the Commissioner.

END OF SECTION 04 01 20.91

SECTION 04 03 21.21 – TERRA COTTA CONSERVATION TREATMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following Documents apply to all required Work for the Project: (1) the Contract Drawings, (2) 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. Performance Requirements.
2. Submittal Procedures.
3. Project Conditions.
4. Quality Assurance.
5. Products and Accessories.
6. Execution.
7. Field Quality Control.
8. Cleaning and Protection.

B. Related Sections.
1. Section 04 21 29 – Terra Cotta Masonry.
2. Section 07 52 00 – Modified Bituminous Membrane Roofing.
3. Section 07 62 00 – Sheet Metal Flashings.

C. For all systems described, provide the following components and their subcomponents of Work:
1. Repair mortar and primers.
2. Glaze repair products and primers.
3. Mechanical anchors.
4. Preconstruction mockups, Samples, and testing.
5. Cleaning.

1.3 REFERENCE STANDARDS AND REGULATIONS

A. The Contractor's materials and workmanship is to comply with current codes listed below. Comply with and obtain all necessary approvals from the New York City Department of Buildings. Where their recommendations or requirements are to a lower standard than required by this Contract Document, this Document is to take precedence. Local codes include the following with the most recent amendments and their references, and are referred to as "Code" in this Section:
1. 2022 New York City Building Code – General Administrative Provisions.

B. Comply with applicable provisions and recommendations of the standards listed below. Where standards conflict or conflict with the provisions of these Specifications, the more stringent must apply. Unless otherwise noted, the latest editions of the standards must apply:
   1. "Preservation Briefs 7: The Preservation of Historic Glazed Terra Cotta," de Teel Patterson Tiller, National Park Service, Technical Preservation Services, 1979.
   2. ASTM D4541 – 02 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.

1.4 DEFINITIONS

A. Materials and procedures for crack repair will depend on the width of crack. For the purposes of this Work, the following definitions and referenced repairs must apply:
   1. Wide (Open) Crack: Crack greater than or equal to 1/32 in. in width.
   2. Hairline Crack: Crack less than or equal to 1/32 in. in width.

B. Materials and procedures for spall repair will depend on the depth of outer surface loss at the deepest point of the spall. For the purposes of this Work, the following definitions must apply:
   1. Chips: Chips, nicks, and glaze spalls less than 2 in. by 2 in. diameter and up to 1/4 in. deep
   2. Glaze Spall: Loss of glaze and underlying clay bisque no greater than 1/4 in. in depth (after removal of loose material).
   3. Bisque Spall: Loss of glaze and underlying clay bisque equal to or greater than 1/4 in. in depth.
      a. Bisque Spall Type I: Less than 1-1/2 in. deep and less than 12 sq in. in area.
      b. Bisque Spall Type II: Greater than 1-1/2 in. deep or greater than 12 sq in. in area.

1.5 PERFORMANCE REQUIREMENTS

A. General Prescriptive Requirements.
   1. For all elements outside of the weather resistive barrier plane, use materials suitable for external conditions that will not deteriorate as a result of weathering:
      a. Elements must resist deleterious effects of water, cleaning agents, temperature variations expected from the specified temperature ranges, gaseous pollutants (including ozone), and weak acids deriving from gaseous pollutants dissolved in water and ultraviolet (UV) radiation exposure during installation and in service.
   2. Use materials in the Contract Work that are chemically compatible with their adjacent materials.

B. General Performance.
   1. Comply with performance requirements specified, and as validated by mockup testing.
   2. Contract Work will:
      a. Withstand the specified deleterious and degrading effects of radiation from the sun, weathering, atmospheric pollution, vermin, fungi, and other growths for the required service life without maintenance in excess of routine cleaning and minor repairs.
      b. Have a resistance to combustion and fire spread appropriate to each part.
      c. Cleaning and maintenance of the Contract Work will be carried out easily, without interfering with building function.
   3. Failure includes inability of the Contract Work to meet the performance requirements set forth in this and all 1.2.B Related Sections, in addition to the following:

a. Noise or vibration created by wind, and thermal and structural movements.
b. Staining of adjacent components or wetting of interior building components.

C. Fire Performance.
1. Contract Work must comply with relevant fire resistance, smoke sealing, and firestopping recommendations stated in the Code, but not less than the following.
a. ASTM E84: Flame Spread Index must be less than 25, Smoke Developed Index must be less than 450.
b. Comply with NFPA 285 acceptance criteria.

D. Component materials must not give off toxic fumes.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.7 ACTION SUBMITTALS

A. Provide the following submittals in addition to submittals listed in DDC General Conditions Section 01 33 00 "Submittal Procedures."
1. Sequence of Work to the Commissioner for approval.
2. Shop Drawings
a. Shop Drawings are to be wholly created by the manufacturer in CAD and drawn to scale.
b. Base Shop Drawings for terra cotta restoration on field measurements of existing conditions.
c. Submit Shop Drawings showing production details, construction of the terra cotta restoration, dimensions, anchorage, and relationship in sufficient detail to cover manufacture, handling, and sequence of erection. Details must be at least half-full size.
d. For more Shop Drawings requirements, refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."
3. Patching Mortar: Submit three finished samples as follows:
a. One 3 in. cube or "cookie" of repair patching mortar, cured.
b. One 3 in. cube of repair patching mortar, cured, including the Thin Fill applied to one side.
c. One 3 in. cube of repair patching mortar, cured, including the Thin Fill applied to one side, and the coating applied to all sides.
4. Coating: Submit "brush out" samples of stipple and solid base coat coating for each different existing terra cotta color (minimum of three colors). After approval of brush out sample, submit coating for each color applied to:
a. Cleaned surfaces of a sample of existing terra cotta bisque and glaze.
b. One 3 in. cube of patching mortar as defined above.

1.8 INFORMATIONAL SUBMITTALS

A. Quality Control Reports.
1. Manufacturer's field reports.

1.9 PROJECT CONDITIONS

A. Comply with all manufacturers requirements and the requirements listed in these Specifications. Where the manufacturer's requirements and these Specifications conflict, comply with whichever is more stringent.

B. Provide 72 hr advance notice if roof-mounted equipment, ductwork, or conduits must be removed to permit Work.

C. Do not apply the terra cotta restoration materials or with the threat of inclement weather. Proceed with installation only when existing and forecasted weather conditions permit terra cotta to be installed according to manufacturer's written instructions and requirements:
   1. Do not install if wind is gusting more than 15 mph or interferes with proper installation.
   2. Application of Contract Work may proceed while air temperature is between 40°F and 85°F, providing the substrate is a minimum of 5°F above the dewpoint, or as required by the manufacturer.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

E. Ensure that substrate materials are dry and free of contaminants. Do not commence with the application unless substrate conditions are suitable. Contractor is to demonstrate that substrate conditions are suitable for the application of the materials.

1.10 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Field Inspection Services: Installer is to arrange with the manufacturer to have the services of a competent manufacturer's field representative at the Project site. The manufacturer's field representative is to review the substrate conditions, instruct Work crews in the proper installation procedures, and provide written recommendations to the Commissioner regarding special conditions related to the Work and corrective action to observed Work that does not conform to the manufacturer's installation or requirements. At a minimum, the manufacturer's technical representative is to provide the following inspections of the membrane:
   1. Project start inspection at the beginning of each phase of the Project to review special detailing conditions and substrate preparation.
   2. Periodic in-progress inspections throughout the Project to evaluate terra cotta application.
   3. Final punch-list inspection at the completion of each phase of the Project.
   4. Inspection to confirm completion of all punch-list items.
   5. The manufacturer's field representative is to provide the Contractor, Commissioner, and the City of New York with written reports after each site visit outlining observations and required corrections from each site visit to comply fully with the manufacturer's installation requirements.

C. Single Source:
   1. Obtain materials through one source from a single manufacturer for the Contract Work. Products from alternate manufacturers must be approved in writing by the primary manufacturer.

D. Mason Qualifications.
   1. Installer meeting the requirements of DDC General Conditions Section 014000 1.7/C/6.
   2. One skilled journeyman mason, trained and certified by the specified terra cotta repair system manufacturer, will be present at all times during terra cotta restoration and must personally direct that portion of the Work.

E. Coating Applicator Qualifications.
   1. Must have a minimum of 3 yrs of experience in application of terra cotta coatings and be certified to install the materials and methods specified.

F. Except as modified by the Project Specifications, cited reference standards or applicable portions thereof must govern the Work.

G. Preconstruction Conference: Attend a preconstruction conference to be held with the Commissioner, the Contractor, and of all participatory trades to discuss practices applicable to this Project and coordination within the Project.

1.11 MOCKUPS

A. Construct mockups of the conditions listed below. Mockups must be constructed by Subcontractor. Coordinate mockup location with the Commissioner before constructing. Notify the Commissioner at least 48 hrs before starting Work on each mockup. Do not proceed with any part of the Work before the corresponding mockup is approved by the Commissioner.

B. Show the bond, mortar, workmanship, full range of colors, and texture for terra cotta repairs including the following sample:
   1. Chip repair.
   2. Glaze spall repair.
   3. Bisque spall repair – Type I.
   4. Bisque spall repair – Type II.
   5. Crack repair (wide and hairline cracks).

C. The mockups will be used to establish both technical and aesthetic standards for the remainder of the Project. Reconstruct the mockups as many times as necessary to meet the Commissioner’s approval, at no additional cost to the City of New York.

D. A minimum of three approved base paint finish colors (that match existing surface colors) are required for all terra cotta repairs. Install the base colors on the wall(s) adjacent to original glaze to match for comparison.

E. Do not begin Work prior to approval of mockups.

F. Samples approved by the Commissioner may become part of the completed Work if undisturbed at time of Substantial Completion.

G. Only qualified workers, whose mockups on site have been accepted, will be allowed to perform the Work of this Section.

H. Completed approved samples must be protected during the Work and must be the standard for all Work.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers.

B. Protect materials during storage and construction. 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.

C. Comply with manufacturer's recommendations for handling epoxy materials.

1.13 PROJECT CONDITIONS

A. Comply with New York City Building Code and the following regulations that govern the Work: OSHA and EPA regulations covering wastewater disposal, VOC regulations, and NYSDEC.

B. Do not apply bisque spall patching material or glaze spall patching material unless material or ambient temperature is between 50°F and 90°F and will remain so for at least 48 hrs following patching.

C. Do not apply glaze repair coating unless material or ambient temperature is between 50°F and 90°F and will remain so for at least 48 hrs following patching.

D. Do not apply bisque or glaze spall patching materials if rain is imminent.

E. In hot (above 90°F) and / or windy weather, schedule patch placement to either coincide with hours in which the patches will be in the shade or during cooler morning hours.

F. Field Measurements: Verify dimensions by field measurement.

G. Schedule Requirements: Work in conjunction with other trades by the timely performance of the Work.

H. Provide safe access for the Commissioner to review the mockup and all Work both during and after the Work.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide products from same manufacturer within each assembly (i.e., mortar patch and spall coating) wherever manufacturer of one product proposed for assembly also makes the other required applications. Where manufacturer does not make all required products, provide written confirmation from each manufacturer that its product is compatible with the others being proposed for the assembly.

2.2 MANUFACTURERS

A. Manufacturers' products and specifications are generally referred to for identification; the products of other manufacturers meeting the specifications and standards of the specified systems may be submitted for review. The burden of proof for "equal" materials is on the Contractor, who must bear the costs and delays involved in the Commissioner's review of substitutions. Check all specified items upon Contract signing and initiate submittals in time to allow early ordering so the Work is not delayed. All materials are to be new, unless designated otherwise.

B. Basis-of-Design Products: Subject to compliance with requirements, provide products listed below by Edison Coatings or comparable product by one of the following:
   1. Cathedral Stone Products.
   2. Conproco.
   3. Or approved equal.

2.3 MATERIALS

A. Mortar for spall repair, patching core holes, and patching where metal inserts are removed:
   1. Application.
      a. Use to rebuild terra cotta and brick bisque spalls and anchor holes.
   2. Material: Custom System 45.
      a. Mortar must be custom formulated to match existing cleaned terra cotta bisque.

B. Cementitious Coating at Typical Areas
   1. Application: Use to fill glaze spalls greater than 6 in. by 6 in.
      a. Material: Thin Fill 55.
   2. Application: Use to fill glaze spalls greater than 6 in. by 6 in. at water table courses (or where active efflorescence is present).
   3. Material
      a. Aquepoxy 250-S30.
      b. Elastowall 351.
      c. Aquathane UA-210.
   4. Application: Use to coat all patched bisque and glaze spalls, all crack repairs, and existing patches. At least three base / finish colors each will be required for terra cotta and brick surfaces.
   5. Material
      a. Primer: Primer #240.
      b. Coating: Aquathane UA-210.
   6. Coating colors and finish to match existing adjacent cleaned terra cotta surfaces. Up to three colors will be required.

C. Materials for Crack Repair.
   1. Material for Hairline Crack Repair: Glaze Repair Coating.
   2. Material for Wide Crack Repair: Edison Custom System 45, coated with Glaze Repair Coating.

D. Drilled Anchors for Path Reinforcement.
   1. Stainless steel dry-set masonry anchors.

2. Length of anchor must be sufficient to provide a minimum of 1-1/2 in. embedment into sound substrate; various lengths will be required.

E. Wire for Patch Reinforcement: Stainless steel wire.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

A. The Work is intended to include all repairs in all areas as may be reasonably inferred from the Drawings and as referenced by the Specifications whether or not specifically shown on the Drawings.

3.3 EXAMINATION

A. Examine all surfaces scheduled to receive repairs for roughness, contaminants, moisture, unsound structural substrates, or other conditions that may impair the repair applications. Notify the City of New York and the Commissioner in writing of any such conditions; do not commence Work until all defects are remedied.

B. Beginning Work indicates Contractor's acceptance of Project conditions.

3.4 SELECTIVE DEMOLITION

A. Carefully remove terra cotta and brick as shown on Drawings to be reinstalled or replaced. Avoid damaging adjacent terra cotta and brick during removal.

B. Sound existing patches by tapping lightly to detect delaminations. Remove unsound patches and existing patches marked for replacement, or those with cracks, spalls, bulging, or non-matching surface texture or profile (non-matching patches to be replaced).

C. Remove all other foreign materials (such as patching compounds and sealants) from areas to be patched.

D. Any adjacent terra cotta and brick damaged during the removal process must be repaired with patching materials and coating, as appropriate and as determined by the Commissioner and specified in this Section, at no additional cost to the City of New York.

3.5 PREPARATION

A. Non-Used Metal Inserts and Attachments.

1. If possible, remove metal inserts. Core or carefully cut out masonry or metal at insert location, taking care to avoid damaging adjacent masonry. If insert cannot be removed, use mechanical means to cut back metal a minimum of 1 in. from surface.
2. After cutting back, prepare and coat remaining metal.
3. Prepare as described in "Bisque Spalls" below.

B. Bisque Spalls.
1. Remove loose and unsound bisque and mortar to a minimum depth of 3/8 in. Leave substrate with a roughened surface.
2. Remove all surface contaminants or coatings which may hinder adhesion, including dirt, stains, efflorescence, salts, and oils.
3. Remove biological growth with biocide, following manufacturer's instructions. Repeat application as necessary to remove growth. Rinse with clean water.
4. Provide 3/8 in. saw cut normal to face of repair area around perimeter of spall.
5. Clean all surfaces to be patched with oil-free compressed air. Do not allow patch areas to be contaminated with oils.

C. Glaze Spalls and Chips.
1. Remove loose and spalling glaze 1/2 in. beyond glaze spall area and 1/2 in. beyond any biological growth found.
2. Remove all surface contaminants or coatings that may hinder adhesion, including dirt, stains, efflorescence, salts, and oils.
3. Remove biological growth with biocide following manufacturer's instructions. Repeat application as necessary to remove growth. Rinse with clean water. Clean all surfaces to be patched with oil-free compressed air. Do not allow patch areas to be contaminated with oils.

D. Existing Repairs.
1. Remove existing unsound patches (cracked, spalled, loose, or delaminated) and then treat as Bisque Spall.
2. Remove paint from patches or bisque with matching texture but failing coating. Then treat as Glaze Spalls.
3. At non-matching but sound paint or patches, prepare surface to receive new Glaze Repair Coating.

E. Cracks.
1. Remove any existing crack fillers and unsound material.
2. Crack Preparation
   a. For Hairline Crack: No preparation.
   b. For Wide Crack: Cut to a width and depth of 3/16 in.
3. Blow out dust and debris with oil-free compressed air.

F. Cleaning.
1. According to the manufacturer's written recommendations.

G. Prior to completing repairs, verify that substrate is in acceptable condition for repair technique.

3.6 BISQUE SPALL REPAIR

A. General.
   1. Install patching mortar, following manufacturer's instructions.

B. Bisque Spall Type I Repair.
   1. Finish: Where patch extends beyond one block, form or cut joint to match existing joint location and point. Patch must not extend across joint.
   2. Allow three to five days cure time or longer as required to dry patch prior to coating installation.

C. Bisque Spall Type II Repair.
   1. Provide Drilled Anchors
      a. Provide one anchor every 16 sq in., with a minimum of two anchors per repair. Minimum anchor embedment is 1-1/2 in. Set anchor with head at mid-depth of patch but in no case with less than 1/2 in. clear mortar cover.
      b. Wrap stainless steel wire between anchors in a crisscross pattern or use stainless steel wire mesh.
      c. Patch as described above.
      d. Allow seven days cure time or longer as required to dry patch prior to coating installation.

3.7 GLAZE SPALL REPAIRS

A. Glaze Spalls.
   1. Install Cementitious Coating at glaze spalls greater than 6 in. x 6 in. in size and finish patch to match texture and profile of surrounding terra cotta.
   2. Allow 48 hrs cure time or longer as required to dry patch prior to coating installation.
   3. At glaze spalls less than 6 in. x 6 in., sand exposed bisque to prepare surface for Glaze Repair Coating.

3.8 CRACK REPAIR

A. Repair all cracked terra cotta and bricks as specified herein unless directed for replacement in the Drawings.

B. For hairline cracks, coat cracks with Glaze Repair Coating.

C. For wide cracks, pack with Edison System 45 patching mortar in thin layers until crack is full.

D. Tool surface flat with face of terra cotta. Remove excess mortar with brush.

E. Allow three to five days cure time prior to coating installation.

3.9 GLAZE REPAIR COATING

A. Application: Use Glaze Repair Coating to all patch repairs, glaze spall repairs, nicks, crack repairs, unfilled hairline cracks, anchor holes drilled through terra cotta and existing patch repairs, whether currently painted or unpainted.

B. Match color, size, frequency, direction, and texture of stippling in areas where stippling is used.

C. If more than 50% of a terra cotta block is to be coated, coat the entire block.

D. Follow manufacturer's instructions.

3.10 CLEAN UP

A. Clean Work areas daily, leaving in broom clean condition.

B. Remove patch materials from any adjacent surface promptly.

C. Remove mortar / grout run off from masonry surfaces.

D. Upon completion of Work, thoroughly clean Work areas.

END OF SECTION 04 03 21.21

SECTION 04 21 16 – CERAMIC GLAZED CLAY 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. Scope of Work

1. Provide new clay wall coping as indicated on Drawings.

B. Related Sections

1. Section 02 41 19 " Selective Demolition"
2. Section 04 01 20.91 "Unit Masonry Restoration"
3. Section 06 10 00 "Rough Carpentry"
4. Section 07 62 00 "Sheet Metal Flashing and Trim"

C. References

1. ASTM C1167- Standard Specification for Clay Roof Tiles
2. ASTM C67- Standard Methods of Sampling and Testing Brick and Structural Clay Tile.
3. ASTM C212- Standard Specification for Structural Clay Facing Tile

1.3 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 "Quality Requirements."

B. Qualification: All work to be performed by mechanics experienced in handling and setting of clay wall coping.

C. Special Experience Qualifications:

1. Historic Treatment Specialist Qualification: A terra cotta masonry specialist meeting the requirements of DDC General Conditions Section 014000 1.7/C/6.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.5 SUBMITTALS

A. Submit manufactures product literature including drawing indicating design of coping with overallunit dimensional information.
B. Samples:

1. Unglazed: Submit one 4 inch by 4 inch sample showing clay color and texture for approval,
2. Glazed: Submit one 4 inch by 4 inch sample showing clay body, glaze color and texture for approval.

C. Material Testing:
1. Testing in accordance with ASTM standards. Use a certified laboratory for testing. Manufacture to supply current test data.

1.6 JOB CONDITIONS

A. Cold Weather: Perform work in accordance with ACI 530.1 current edition.

B. Hot Weather: Perform work in accordance with ACI530.1 current edition.

C. At the end of each workday, or during rainy weather, cover masonry work exposed to weather with waterproof coverage and securely anchor as necessary.

PART 2 PRODUCTS

2.1 MATERIAL

A. Basis-of-Design Product: Terra Cotta Camelback wall coping, manufactured by Superior Clay Corporation, or the following manufacturers.

1. Terra Cotta Camelback wall coping, manufactured by Pomona Pipe Products.
2. Terra Cotta Camelback wall coping, manufactured by Logan Clay Masonry.
3. Or approved equal.

B. Quality Control:

1. Wall Coping must conform to the physical requirements listed below as performed in accordance with ASTM specifications.

a. Absorption- C67
b. Freeze Thaw- C67
c. Compressive Strength- C67

2. Dimension Tolerance: Variation in dimensions must not exceed +/- 5% in any direction from dimension specified per ASTM-C1167.

3. Finish faces that will be exposed when installed must be free from chips, blisters or other imperfections detracting from the appearance when viewed for a distance of 40 ft as per ASTM-C1167.

2.2 PERFORMANCE REQUIREMENTS

	A. Test Average (based on 5 samples)	Method	Criteria
B.	Absorption (5-hour boil) - 8%	ASTM-67	ASTM C212
C.	Freeze/Thaw Resistance	ASTM-C67	ASTM-C1167
D.	Compressive Strength-8000psi	ASTM-C67	ASTM-C212

1. If mechanical anchoring is required, all anchors must be stainless steel or non-corrosive metals.

2.3 MORTARS

A. Mortars must comply with ASTM C270.

B. Grouts must comply to ASTM C476.

C. Cementitious Materials:
   1. Portland Cement: ASTM C150, Type II or I: Low-alkali per ASTM C150, table 2.
   2. Hydrated Lime: ASTM C207, Type S.

D. Aggregates:
   1. Sand: Clean, washed natural or manufactured silica sand grated according to ASTM C144.
   2. Sand contains no more than 50 parts per million of chloride ions and must be free of organic contaminants.
   3. Coarse Aggregates: ASTM C404 with a maximum size of 3/8” diameter. Aggregates must contain no more than 50 parts per million of chloride ions and must be free of organic contaminants.

E. Water: Potable, clean and free from injurious amounts of oil, alkali, organic matter or other deleterious material.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION GENERAL

A. Establish lines, levels, and coursing. Protect from disturbance.

B. Coping must be set in bed of mortar laid upon existing or new wall. Head joints may be either mortar or approved caulking.

C. Exposed free standing construction, subject to absorption of water through mortar joints and liable to injury from subsequent freezing, or expansion of improper filling material, should generally be left unfilled and should be ventilated by means of small, inconspicuously placed weep holes.

D. Maintain uniform joint widths.

E. All anchors must be either stainless steel or non-corrosive metals.

F. Flash per methods as required by referenced standards.

3.3 MIXING MORTAR

A. Mixing and proportion cementitious materials for site made setting beds:

1. Setting Mortar: Use Type M mortar, in accordance with ASTM C270 with the following material mix proportion by volume:

   a. Portland cement: 1 part
   b. Hydrated Lime: ¼ part
   c. Sand: 3 ½ parts
   d. The color of mortar must match the building's existing cleaned mortar, or as specified by the Commissioner.
   e. Use colored sand to obtain desired mortar color.

2. Pointing Mortar: Use setting mortar for new construction. If new construction is adjacent to existing, match color of mortar.

   a. Mortar for pointing: Use Type N mortar, in accordance with ASTM C270, with the following partialmix proportion by volume:
   b. Portland Cement: 1 part
   c. Hydrated Lime: 1 part
   d. Sand: 6 parts

3. The color of mortar must match building existing cleaned mortar, or as specified by the

Commissioner. Use 5 ft x 5 ft area of cleaned mortar for each repointing area for color matching.

4. Use color sand to obtain mortar color.

3.4 POINTING JOINTS

A. Pointing

1. Refer to ASI 530.1 current edition for hot and cold weather construction.
2. Wet joint thoroughly prior to pointing and between pointing lefts. Allow water to soak in so that no free-standing water is visible.
3. Point in two lifts, pack joints to within 3/8” of surface on first lift; allow first lift to set prior to pointing second lift.
4. As soon as mortar has taken its initial set, tool joint surfaces to be slightly concave.

a. After an initial 24-hour set, moisten until cured. Allow mortar to cure completely prior to cleaning operations, minimum 30 days.
b. Clean up after pointing operations are complete. Remove mortar stains, excess mortar, etc., from all surrounding surfaces. Do not use acids, rinse thoroughly after cleanup operations.

B. Caulked Joints:

1. Use approved sealant as specified.

a. Rake joints out ½”. Install backer rods and sealant per manufacturers specifications.

3.5 CUTTING AND FITTING

A. Cutting and fitting of coping may be required at site. The cutting must be done by the installation subcontractor.

END OF SECTION 04 21 16

SECTION 04 21 29 – TERRA COTTA 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. Performance Requirements.
2. Submittal Procedures.
3. Project Conditions.
4. Quality Assurance.
5. Warranty.
6. Products and Accessories.
7. Execution.
8. Field Quality Control.
9. Cleaning and Protection.

B. Related Sections
1. Section 07 52 00 – Modified Bituminous Membrane Roofing.
2. Section 07 62 00 – Sheet Metal Flashings.

C. For all systems described, provide the following components and their subcomponents of Work:
1. New terra cotta units to match existing.
2. Mortar.
3. Sealants.
4. Fixings and fastenings.
5. Flashings.
6. Penetrations for other services.
7. Pre-construction mockups, Samples, and testing.

1.3 REFERENCE STANDARDS AND REGULATIONS

A. The Contractor’s design, materials, and workmanship is to comply with current codes listed below. Comply with and obtain all necessary approvals from the New York City Department of Buildings. Where their recommendations or requirements are to a lower standard than required by this Contract Document, this Document is to take precedence. Local codes include the following with the most recent amendments and their references, and are referred to as “Code” in this Section:
1. 2022 New York City Building Code – General Administrative Provisions.

B. Comply with applicable provisions and recommendations of the standards listed below. Where standards conflict or conflict with the provisions of these Specifications, the more stringent are to apply. Unless otherwise noted, the latest editions of the standards are to apply:
   1. American Concrete Institute (ACI)
      a. ACI 530 / 530.1 – Building Code Requirements for Masonry Structures.
   2. American Institute of Steel Construction (AISC)
      a. AISC Steel Construction Manual.
   3. American Iron and Steel Institute (AISI)
      a. AISI North American Cold-Formed Steel Design Manual.
   4. American Society of Civil Engineers (ASCE)
      a. ASCE 7 – Minimum Design Loads for Buildings and Other Structures.
   5. ASTM International (ASTM)
      a. ASTM A240/A240M – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
      b. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
      c. ASTM C67 – Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
      d. ASTM C126 – Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.
      e. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.
      f. ASTM C150 – Standard Specification for Portland Cement.
      g. ASTM C207 – Specifications for Hydrated Lime for Masonry Purposes.
      h. ASTM C270 – Standard Specification for Mortar for Unit Masonry.
      i. ASTM C780 – Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
      j. ASTM C1180 – Terminology of Mortar and Grout for Unit Masonry.
      k. ASTM C1193 – Standard Guide for Use of Joint Sealants.
      l. ASTM C1232 – Standard Terminology of Masonry.
      m. ASTM D2244 – Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
      n. ASTM E488 – Standard Test Methods for Strength of Anchors in Concrete Elements.
      o. ASTM E754 – Standard Test Method for Pullout Resistance of Ties and Anchors Embedded in Masonry Mortar Joints.
      p. ASTM E2265 – Standard Terminology for Anchors and Fasteners in Concrete and Masonry.
   6. National Fire Protection Association (NFPA)
      a. NFPA 259 – Standard Test Method for Potential Heat of Building Materials.
      b. NFPA 268 – Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source.
      c. NFPA 285 – Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

1.4 PERFORMANCE REQUIREMENTS

A. General Prescriptive Requirements
   1. For all elements outside of the weather resistive barrier plane, use materials suitable for external conditions that will not deteriorate as a result of weathering:

a. Elements must resist deleterious effects of water, cleaning agents, temperature variations expected from the specified temperature ranges, gaseous pollutants (including ozone), and weak acids deriving from gaseous pollutants dissolved in water and ultraviolet (UV) radiation exposure during installation and in service.
b. Use suitable grade of stainless or galvanized steel for all fasteners outside or through the air and vapor barrier.
    1) Seal all fasteners that penetrate through air and vapor barrier with material chemically compatible with fastener and adjacent materials.
c. Use suitable grade of stainless steel or galvanized steel for all brackets outside the air and vapor barrier.
d. Do not use different metals for significant structural connections that occur outboard of the air and vapor barrier unless:
    1) The connection can incorporate bimetallic separators.
    2) The connection can be fully inspected after installation is complete using the Project's maintenance access system.

2. Use materials in the Contract Work that are chemically compatible with their adjacent materials.
3. Brackets for site-drilled fasteners must allow for the possibility of reinforcement or other obstructions being encountered and the fixing position being moved as a result.

B. General Performance
1. Comply with performance requirements specified, and as validated by mockup testing described in Related Sections.
2. Contract Work must:
    a. Withstand and accommodate the stresses and movements induced by the specified cambers, estimated deflections, relative deflections, and the long-term movements associated with the settlement of the foundations, or any other movements of the structure, changes in temperature, moisture content, and chemical changes.
    b. Include suitable allowances for the specified construction tolerances.
    c. Withstand the specified deleterious and degrading effects of radiation from the sun, weathering, atmospheric pollution, vermin, fungi, and other growths for the required service life without maintenance in excess of routine cleaning and minor repairs.
    d. Have a resistance to combustion and fire spread appropriate to each part.
    e. Cleaning and maintenance of the Contract Work is to be carried out easily, without interfering with building function.
3. Failure includes inability of the Contract Work to meet the performance requirements set forth in this and all Related Sections, in addition to the following:
    a. Noise or vibration created by wind, and thermal and structural movements.
    b. Staining of adjacent components or wetting of interior building components.

C. Provide accommodation for the most onerous movement when all tolerances are accounted for.

D. Incorporate thermal isolation devices / thermal breaks wherever possible to minimize thermal bridging.

E. Anchorage must allow for adjustments by 1 in. in small increments in and out, up and down, and side to side in the position of the Contract Work supports relative to other constructions, to accommodate the full variations in the underlying construction and fabrication tolerances.

F. Durability Performance

1. Provide materials that will not be damaged by freeze-thaw cycling according to ASTM C67.

G. Structural Performance
   1. The Contract Work must transmit the design loads as specified below to the building structure via the points of attachment as designed and built, with an adequate margin of safety appropriate to each material and product as required by New York City Building Code and the listed Reference Standards.
   2. As required by New York City Building Code, consider the various load cases and combinations of load cases acting on structural elements.
   3. Coordinate all loads imposed on the building structure with the Commissioner.

H. Movement Performance
   1. The Contract Work must accommodate the movements as per New York City Building Code and as developed by the building structure without any reduction in performance below the minimum levels required herein. These include but are not limited to:
      a. Movements due to design gravity and live loads.
      b. Movements under repeated cycles of the design wind loads.
      c. Movements due to seismic loads.
      d. Changes in dimension and shape arising from specified building movements, including settlement, shrinkage, elastic shortening, floor beam deflections, creep, wind sway, twisting and racking, and thermal and moisture movement. These include movements due to any joint in the supporting structure or building frame.
   2. Coordinate all building movement assumptions with the Commissioner and as per the Structural Drawings.
   3. All brackets and fasteners must have no risk of loosening due to the effects of vibrations, or to the cyclic effects of load, deflections, and thermal movements.

I. Deflection Performance
   1. Provide Contract Work that accommodates the dimensional construction tolerances of building structure and other adjacent constructions.
   2. The Contract Work must accommodate thermal deflections and movements resulting from the following maximum change (range) in ambient and surface temperatures. Changes in dimension resulting from changes in temperature in any of its parts, its supporting framework, and brackets must not result in any reduction in the specified performance.
   3. The Contract Work must accommodate deflections and/or movements resulting from moisture without any reduction in the specified performance. This includes:
      a. Changes in moisture content of Contract Work components, including those due to wetting from rain.
      b. Expansion of absorbed or retained moisture due to freezing.
   4. The Contractor is to avoid, in its fabrication and detailing, introducing locked-in stresses that may be detrimental to the performance of the Contract Work during the service life.

J. Fire Performance
   1. Contract Work must comply with relevant fire resistance, smoke sealing, and firestopping recommendations stated in the New York City Building Code, but not less than the following.
      a. ASTM E84: Flame Spread Index must be less than 25, Smoke Developed Index must be less than 450.
      b. Comply with NFPA 285 acceptance criteria.
   2. Component materials are to not give off toxic fumes.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures.”

1.6 ACTION SUBMITTALS

A. Production Schedule: Submit updated production schedule on a biweekly basis, beginning with date of Agreement. Production schedule must include dates for the following:
   1. Field documentation.
   2. Glaze samples submittal.
   3. Shop and setting Drawings submittal.
   4. Tests prior to production submittal.
   5. Quality control tests submittal.
   6. Terra cotta full-size samples submittal.
   7. Mock-up installation and approvals.
   8. Completion of fabrication, by unit type.
   9. Firing, by unit type.
   10. Shipping and delivery, by unit type, including production samples.

B. Field Survey: Prior to start of the demolition Work, conduct a survey of the existing terra cotta. Coordinate survey with the terra cotta manufacturer and Commissioner, so that they can be present at the beginning of the survey. As a minimum, record the following information:
   1. Plans and elevations locating the terra cotta blocks scheduled for replacement.
   2. Quantity of each type of severely damaged, loose, and/or broken terra cotta block requiring replacement.
   3. Dimensions of each distinct type of block; generate type designations as appropriate.
   4. Coursing dimensions: Submit elevation Drawings showing type and coursing for each individual block. Submit type Drawings showing individual block types, and all dimensions required to replicate them. Do not begin demolition Work until all elevation and type Drawings are approved by the Commissioner.
   5. Remove existing blocks to be replaced in order to determine thickness and anchorage details.

C. Shop Drawings
   1. Shop Drawings are to be wholly created by the manufacturer in CAD and drawn to scale.
   2. Base Shop Drawings for terra cotta units and their installation on field measurements of existing conditions.
   3. Submit Shop Drawings showing production details, construction of the terra cotta, dimensions, anchorage, and relationship in sufficient detail to cover manufacture, handling, and sequence of erection. Shop Drawings must show details of sections and connections for fastening block units, and is to identify anchorage, flashing, counterflashing, and accessory items. Details must be at least half-full size.
   4. Submit setting Drawings showing location of all manufactured terra cotta units. Setting Drawings must be approved by both the manufacturer and the Contractor prior to submission and are to show anchorage details for each type of block, coordinated with other relevant sections of the Construction Documents.
   5. Each replacement unit must have a separate identification mark and is to be marked with the year of manufacture. Units are to be identified by this identification mark on Shop Drawings to show location of replacement blocks for installation. Put identification marks on back of replacement blocks in an appropriate location.

D. Material Glaze Samples (Prior to Production)
   1. Produce at least three distinct glaze color samples for each typical Project color.
   2. Submit five samples of glazed terra cotta for approval of each glaze color, covering expected range of color, pattern, texture, and surface finish as required to match original color, texture, and finish. Each glaze sample must be not less than 3 in. by 6 in. in size.
   3. Repeat sample submittals until acceptable match is approved by the Commissioner.
   4. Submit three 12 in. x 12 in. samples of each glaze color, bracketing the range of colors the production terra cotta will fall between.

E. Quality Control Documentation: Provide documentation showing that the items below meet the requirements for fabrication or installation as listed.
   1. Certifications (in time for review to prevent delay in the Work) by the producers of the terra cotta and all associated materials suppliers that all materials supplied comply with all the requirements of the referenced standards, and that all materials are suitable for the use specified herein.

F. Three (3) copies of manufacturer's specifications and installation instructions for each item of proprietary material used, showing compliance with its use.

G. Material Safety Data Sheets (SDS) for all materials to be used.

H. Inspections at Terra Cotta Plant: Every piece of terra cotta must be inspected and measured by an independent inspector before shipping. Any blocks having defects or not meeting specified tolerances must be remade. Submit a list showing for each block:
   1. Overall dimensions, according to Shop Drawings.
   2. Actual dimensions.
   3. Amount over or under.
   4. If block is within specified tolerance.
   5. Defects noted.

I. Product Data and Testing Reports: As specified herein

J. Quality Control Plan

1.7 INFORMATIONAL SUBMITTALS

A. Quality Control Reports
   1. Manufacturer's field reports.

1.8 CLOSEOUT SUBMITTALS

A. As-built Shop Drawings showing the final installation for all replacement terra cotta units.

1.9 PROJECT CONDITIONS

A. Comply with all manufacturers requirements and the requirements listed in these Specifications. Where the manufacturer's requirements and these Specifications conflict, comply with whichever is more stringent.

B. Provide 72 hr advance notice if roof-mounted equipment, ductwork, or conduits must be removed to permit Work.

C. Do not apply the terra cotta during or with the threat of inclement weather. Proceed with installation only when existing and forecasted weather conditions permit terra cotta to be installed according to manufacturer's written instructions and Warranty requirements:
   1. Do not install if wind is gusting more than 15 mph or interferes with proper installation.
   2. Application of Contract Work may proceed while air temperature is between 40°F and 85°F, providing the substrate is a minimum of 5°F above the dewpoint, or as required by the manufacturer.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

E. Ensure that substrate materials are dry and free of contaminants. Do not commence with the application unless substrate conditions are suitable. Contractor is to demonstrate that substrate conditions are suitable for the application of the materials.

F. Do not proceed with installation of joint Sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint Sealant manufacturer or are below 40°F.
   2. When joint substrates are wet.
   3. Where joint widths are less than those permitted by joint Sealant manufacturer for applications indicated. Notify Commissioner of condition.
   4. Where contaminants capable of interfering with adhesion have not been removed from joint substrates.

1.10 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Field Inspection Services: Installer is to arrange with the manufacturer to have the services of a competent manufacturer’s field representative at the Project site. The manufacturer’s field representative is to review the substrate conditions, instruct Work crews in the proper installation procedures, and provide written recommendations to the Commissioner regarding special conditions related to the Work and corrective action to observed Work that does not conform to the manufacturer’s installation or Warranty requirements. At a minimum, the manufacturer’s technical representative is to provide the following inspections of the membrane:
   1. Project start inspection at the beginning of each phase of the Project to review special detailing conditions and substrate preparation.
   2. Periodic in-progress inspections throughout the Project to evaluate terra cotta application.
   3. Final punch-list inspection at the completion of each phase of the Project.
   4. Warranty inspection to confirm completion of all punch-list items.
   5. The manufacturer’s field representative is to provide the Contractor, Commissioner, and the City of New York with written reports after each site visit outlining observations and required corrections from each site visit to comply fully with the manufacturer’s installation and Warranty requirements.

C. Single Source: Obtain materials through one source from a single manufacturer for the Contract Work.

D. Before shipping terra cotta to the Project site, the manufacturer must inspect each piece to ensure that it meets dimensional tolerance and appearance criteria specified herein. For all piece types, where more than five pieces total will be made, the manufacturer will create two inverse templates of the approved mock-up piece. One template must be stored at the manufacturer’s plant, and all of the same type of pieces shipped to the site

will be compared to the template prior to shipping. The other template will be stored at the site, and all of the same type of pieces will be compared to the template prior to moving the pieces onto the roofs. Pieces that exceed the Project dimensional tolerances must be not shipped or taken to the roof.

E. Check the progress twice each workday to ensure that the replaced masonry properly aligns.

F. Mason Qualifications: Installer meeting the requirements of DDC General Conditions Section 014000 1.7/C/6.

1.11 MOCKUPS

A. Working in conjunction with the Related Sections, construct full-scale mockups of the conditions listed below. Mockups must be constructed by scheduled installer. Manufacturer must provide technical representatives to oversee installation and be present during review by Commissioner. Mockup can be constructed on full-scale wood and plywood mockup base to act as the base geometry.

B. Include all required flashing, membranes, fasteners, attachments, terra-cotta units, and other components as required. Complete flashing mockups in conjunction and have in place and approved before the terra cotta tile mockup can begin. Notify the Commissioner at least 48 hrs before starting Work on each mockup; mockup review will occur within three weeks of notification that mockup is complete and ready for review. Do not proceed with any part of the Work, including subsequent mockups, before the appropriate mockups are approved by the Commissioner.

C. Construct full-scale mockups of the following conditions:
1. Terra Cotta Wall Units: Three side by side.
2. Terra Cotta Block Coping Units: Three side by side.
3. Horizontal Terra Cotta Camelback Units: Three side by side.
4. Sloped Terra Cotta Camelback Units: Three side by side.

D. The mockups will be used to establish both technical and aesthetic standards for the remainder of the Project. Reconstruct the mockups as many times as necessary to obtain the Commissioner's approval, at no additional cost to DDC. Approved mockup terra cotta pieces will be used to create inverse molds for quality control.

1.12 WARRANTY

A. Manufacturer is to warrant terra cotta for a period of 5 years from date of Substantial Completion against possible material defects.

PART 2 - PRODUCTS

2.1 GENERAL

A. Unless approved by the Commissioner, obtain all materials from the same manufacturer. Check all specified items, and order early so the Work is not delayed.

2.2 TERRA COTTA

A. Do not proceed with fabrication of terra cotta prior to approval of shop Drawings, samples, and malleable mockups. Do not begin fabrication in "production mode" until the mockups are approved.

B. Terra Cotta (Replacement Pieces)
1. Surface Features and Shape: Match colors, surface texture, size, and exterior profiles of existing units except where noted on the Drawings. Modify shape of interior concealed portions of units, such as interior webs, to accommodate fastening system as shown on the Drawings or as needed to reflect changes in the support structure or underlayment.
2. Underbody: Integrally colored to closely match surface color of tile.
3. Compressive Strength: Minimum 8,000 psi when tested in accordance with ASTM C39. Consult with the Commissioner to modify test procedure specified in ASTM C39 as appropriate for small terra cotta specimen.
4. Absorption: Maximum 6% during 24 hr cold water absorption test and maximum saturation coefficient of 0.69, when tested in accordance with ASTM C67.
5. Permeability, 24 Hr Soak
   a. With Glaze: 0%. Test in accordance with ASTM C67, except coat exposed bisque, so that only the glazed surface is exposed to water.
   b. Without Glaze: Maximum 9%, in accordance with ASTM C67.
6. Glaze Adhesion: Minimum Average Glaze Adhesion Bond Strength: 200 psi. Failure must be within glaze or bisque, not at interface. Not more than one sample in five can break at less than 200 psi. No samples can break below 170 psi.
7. Sizes: Dimensions as indicated on approved Shop Drawings. Dimension tiles so they can be set with uniform joints.
8. Clay Materials: Limit the amount of Kaolinite clay to less than 40%
9. Dimensional Tolerances
   a. Length, width, thickness, and placement of interior webs of each tile are to not vary more than 1/8 in. from the dimensions shown on the Shop Drawings.
   b. Average length, width, and thickness must match dimensions shown on the Shop Drawings. Repetitive growth in tile dimensions is not allowed.
   c. Locations of anchor holes in each unit must not vary more than 1/16 in. from the dimensions shown on the Shop Drawings.
10. Finish
   a. Finished faces are to be free from crazing, blisters, pinholes, staining, chips, or other imperfections in accordance with ASTM C126, and from imperfections that detract from the appearance of the unit when viewed from a distance of 5 ft.
   b. Conform to ASTM C126, Section 6 – Properties of Finish.
11. Fabricate units with provisions for anchors and fastening as shown on the Drawings and approved Shop Drawings.
12. Configure units as detailed on the Drawings.
13. Limited shop cutting of terra cotta pieces will be approved on a case-by-case basis by the Commissioner. Shop cutting must be performed with a diamond blade, and pieces must be placed on rubber mat to minimize vibration. Pieces with finish damage resulting from cutting will be rejected.
14. Each replacement unit must have a separate identification mark (matching the type designations generated for the specified survey and must be permanently marked in an unexposed location with this identification mark, the name of the manufacturer, and the year of manufacture.

2.3 FASTENERS

A. General: Fasteners must meet no less than the most stringent standards as required and its reference standards, or the following requirements:
   1. Fasteners must account for any reduction in safe working loads due to their spacing, location in areas of tension, near edges, or proximity to cast-in inserts/existing fasteners, or thickness of shims.
   2. All exterior fasteners or fasteners in wet areas must be of a suitable grade of stainless steel. Only use weather coatings for corrosion resistance with the Commissioner's approval.
   3. Where post drilled or site-drilled fasteners are used for connections to the external structural steel frame, do not compromise the integrity of the steel corrosion protection system.
   4. Highlight the general requirement for torquing of bolts and clearly state tightening torque values in the Shop Drawings.
   5. The Contractor must provide for Commissioner's review, documentation demonstrating the use of all fasteners installed has been reviewed and approved by the fastener manufacturer and prior to installation must submit manufacturer's written certification that details proposed by the Contractor are appropriate for their intended use.

B. Fasteners Used in Cold-Formed Steel Framing Backup Construction
   1. Fastener selection and sizing must be in accordance with the AISI Cold-Formed Steel Design Manual.

2.4 MATERIALS

A. Steel Components
   1. Manufacturer's recommended alloy and temper meeting the requirements and standards listed herein for type of use and finish indicated in accordance with:
      a. Structural Shapes, Plates, and Bars: ASTM A36/A36M/A572.
      b. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
      c. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.
      d. Galvanized Sheet: ASTM A653/A653M.

B. Stainless Steel
   1. Manufacturer's recommended alloy and temper meeting the requirements and standards listed herein for type of use and finish indicated in accordance with:
      a. Plate, Sheet and Strip: ASTM A240/A240M.
   2. With a Pitting Resistance Equivalence Number (PREN) greater than 24 calculated using the formula 'PREN = %Cr + 3.3 x %Mo + 16 x %N' based on the minimum compositions for Chromium, Molybdenum, and Nitrogen given in ASTM A240 or equivalent.

2.5 ACCESSORIES

A. Shims: Non-staining, plastic.

B. Compressible Fill and Expansion Joint Filler: Closed-Cell Neoprene Sponge: NS – Closed Cell Neoprene Sponge, by Hohmann & Barnard, Inc.

2.6 MISCELLANEOUS MATERIALS

A. Cleaning Compound: Water and stiff bristle brush with cleaning compound recommended by terra cotta manufacturer. Do not use cleaning compounds containing acids.

2.7 SHEET METAL FLASHING

A. Refer to Section 07 62 00 – Sheet Metal Flashings and Trim for performance requirements.

2.8 SEALANTS

A. Refer to Section 07 52 00 – Modified Bituminous Membrane Roofing for performance requirements.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify all site conditions and dimensions by field measurements in consideration of the special conditions associated with alterations of existing construction and reconstruction. Notify the Commissioner immediately of any inconsistency between field conditions found during demolition and those shown in the Contract Drawings. The Commissioner will determine what modifications or additional repairs are necessary.

B. Beginning Work indicates Contractor's acceptance of Project conditions.

3.3 GENERAL

A. Employ only competent mechanics who are properly trained to handle and install terra cotta tiles.

B. Prior to installation of terra cotta units, check jobsite dimensions affecting the Work. Bring to the attention of the Commissioner any discrepancies between design dimensions, Shop Drawing dimensions, and field dimensions which could adversely affect installation in strict accordance with the Contract Documents. Do not proceed until such conditions are corrected or until installation requirements are modified in writing by the Commissioner.

C. Shop-cutting and field-cutting of tiles must be approved by the Commissioner on a case-by-case basis.

3.4 TERRA COTTA – GENERAL INSTALLATION

A. Do not begin to install terra cotta units until all metal roofing and flashing Work that will be covered by the terra cotta has been completed, tested, and accepted by the Commissioner.

B. Do not damage completed flashing Work during terra cotta placement. Repair all damage at no cost to the City of New York.

C. Erect all terra cotta units level, plumb, square, straight, and true. Position units so that cumulative dimensional errors will not occur. Align horizontal and vertical joints correctly and maintain uniform joint width as erection progresses. Terra cotta units must be continuously supported by the attachments shown on the Drawings.

D. For mortar set tiles, set tiles with full head and bed joints.

E. Protect finished terra cotta from water infiltration during construction. Do not allow terra cotta to become saturated at any time during construction.

3.5 FIELD QUALITY CONTROL

A. Test and inspect representative areas of the Contract Work as installation proceeds to determine compliance of installed assemblies with specified requirements.

3.6 CLEANING AND PROTECTION

A. Do not stain terra cotta face or any surface with mortar drippings or other substances. Dry-brush newly completed masonry and exposed flashing surfaces daily to clean and remove set mortar.

B. Protect incomplete Work, whenever Work is not being performed, by well-fastened waterproof coverings, including covering the tops of walls at the end of the workday or during rain. Protect flashings against any penetration or other damage. Turn scaffold boards on edge at end of day and protect the base of the wall to prevent rain splashed mud or mortar drippings from contacting masonry.

C. Clean down all masonry promptly after curing by wetting surfaces and washing with a stiff bristle brush to produce a clean and unmarred appearance. Begin cleaning with water only, without chemical cleaners. If water alone with a scrub brush is not successful, as determined by the Commissioner, use an approved cleaning compound. Dilute the compound with the maximum amount of water that will allow proper cleaning, as approved by the Commissioner. Test the cleaning compound in a small inconspicuous area before beginning full-scale cleaning. Cover all existing exposed metal, precast concrete, glazing, and other areas as required before cleaning the masonry with any cleaning compounds. Remove efflorescence, if any, as directed by the Commissioner. Do not use metal scrapers to clean the masonry. Rinse repeatedly with clean water after cleaning to remove all traces of mortar and debris. Protect all exterior finishes from any damage or staining caused by this Work.

D. There must be no evidence of water penetration as per specified weatherproofing requirements.

E. Repair or remove and replace Contract Work that does not meet requirements; replace to conform to specified requirements.

F. Contract Work is considered defective if it does not pass tests and inspections.

END OF SECTION 04 21 29

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following Documents apply to all required Work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. The Work includes labor, materials, equipment, and services required for completion of Work under this Section as shown on Drawings and as specified here.

B. This Section includes the following:
   1. Structural steel and connections not specifically detailed on the Drawings.
   2. Steel deck support angles.
   3. Grout.
   4. Hot-dip galvanizing of steel material.
   5. Shop priming of steel material.

C. Related Sections include the following:
   1. Section 09 91 00 –Painting.

D. Work furnished under this Section and installed under other Sections:
   1. Section 03 30 00 – Cast-In-Place Concrete for installation of structural shapes, bolts, angles, plates, and inserts embedded in new concrete.

1.3 DEFINITIONS

A. Structural Steel. Elements of structural-steel frame, as classified by AISC Code of Standard Practice for Steel Buildings and Bridges, that support design loads.

B. Special Inspector: Personnel performing City of New York provided testing and inspection as specified and as required by the New York City Building Code (NYCBC), with current revisions.

C. Fabricator's Engineer: Professional Structural Engineer licensed in the State of New York, responsible for the structural design of connections.

1.4 PERFORMANCE REQUIREMENTS

A. Detailing. Detail structural members, connections, accessories, and temporary components required for transportation and erection.
   1. Refer to Architectural Details for miscellaneous items, tolerances, and provisions to be made for the attachment of other materials.
   2. Where indicated as requiring coordination, refer to approved mechanical Shop Drawings for exact location and dimensions of supports for mechanical equipment and penetrations.

B. Connections. Detail all connections based on Contract Drawings.
   1. Where appropriate, select and complete connections using schematic details indicated and AISC Manual of Steel Construction, 15th Edition, Load and Resistance Factor Design, Part 9.
   2. Engineering Responsibility: Fabricator's responsibilities include using a qualified Professional Engineer licensed in the State of New York to prepare structural analysis data for structural-steel connections to withstand loads indicated and comply with other information and restrictions indicated.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.6 SUBMITTALS

A. International Code Council Evaluation Service Reports: For each type of product indicated where product other than that specified in Construction Documents is proposed for use. Use will be subject to Commissioner's approval.
   1. Expansion anchors.
   2. Adhesive anchors.

B. Product Data. For each type of product indicated including, but not limited to, the following:
   1. Expansion anchors.
   2. Adhesive anchors.
   3. Welding filler metals and fluxes.
   4. Galvanizing repair paint.

C. Shop Drawings. Show fabrication of structural-steel components.
   1. Before submitting Shop Drawings to the Commissioner, precheck the Shop Drawings for conformity of details to the Contract Documents and as coordinated with other Work. The Contractor is wholly responsible for the conformity of dimensions and details of the Shop Drawings with the Contract Documents.
   2. Submit job standard connection details and calculations, signed and sealed by the Contractor's Engineer licensed in the State of New York, before detail Drawings. Shop Drawings submitted prior to job standard connection details and calculations will not be reviewed or returned until the connection details are reviewed and approved. Include structural analysis data, signed and sealed by the Fabricator's Engineer licensed in the State of New York responsible for their preparation, substantiating the connection designs. Submit connection information in tabular form with:
      a. Weld sizes.
      b. Sizes and material of connecting elements.
      c. Number, size, and type of bolt.
      d. Material: minimum thickness of supporting member part.
      e. Material and minimum thickness of supported member part.
   3. Submit erection plans before or with detail Drawings.
   4. Resubmitted Drawings
      a. Clearly and individually identify changes in resubmitted Shop Drawings, whether the change results from a review comment or not.
      b. Date and identify each Shop Drawing issue.
      c. Identify each Shop Drawing by the same Drawing number throughout the duration of the Project.
   5. Include on detail Drawings:

a. Details and dimensions of all pieces.
b. Steel material designation.
c. Surface preparation and finish.
d. Details of cuts, connections, splices, camber, holes, welds, bolts, and other pertinent data.
e. Identification marks cross-referenced to erection plans.

6. Include embedment Drawings.
7. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
8. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
9. For structural-steel connections indicated to comply with design loads, include structural analysis data signed and sealed by the Fabricator's Engineer responsible for their preparation.
10. Approval of the Shop Drawings is for size and arrangement of principal and auxiliary members and conformance of connections. Approval does not relieve the Contractor's responsibility for dimensions, fabrications, and correct fitting of structural members.

D. Welding Procedure Specifications (WPS's) and Procedure Qualification Record (PQR's): Provide according to AWS D1.1, Structural Welding Code – Steel, for each welded joint, whether prequalified or qualified by testing, including the following:
1. Power source (constant current or constant voltage).
2. Electrode Manufacturer and trade name for critical welds.

E. Welding Certificates.

F. Mill Test Reports. Signed by Manufacturers certifying that the following products comply with requirements:
1. Structural steel, including chemical and physical properties.
2. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
3. Tension-control, high-strength bolt-nut-washer assemblies.
4. Shop primers.
5. Non-shrink grout.

G. Survey of Existing Conditions.

H. Source Quality-Control Test Reports.

I. Galvanizing. Submit an original and two copies of the coating applicator's Certificate of Compliance that the hot-dip galvanized coating meets or exceeds the specified requirements of ASTM A123 or ASTM A153 as applicable.

J. Fabrication and Erection Errors. Notify Commissioner of fabrication or erection errors requiring field Work. Before performing corrective Work, submit for review and approval description of field Work.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Contractor's Installer Qualifications. A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.

C. Contractor's Fabricator Qualifications. A qualified Fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU.

D. Contractor's Shop-Painting Applicators. Qualified according to AISC's Sophisticated Paint Endorsement P1 or SSPC-QP 3 – Standard Procedure for Evaluating Qualifications of Shop Painting Applicators.

E. Contractor's Galvanizing Applicators. Company specializing in hot-dip galvanizing after fabrications and following the procedures of the Quality Assurance Manual of the American Galvanizers Association.

F. Welding. Qualify procedures and personnel according to AWS D1.1 – Structural Welding Code-Steel.
   1. Welders and Welding Operators performing Work on bottom-flange, demand-critical welds will pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G will be considered separate processes for welding personnel qualification.

G. Comply with applicable provisions of the following Specifications and Documents as amended herein:
   1. AISC Code of Standard Practice for Steel Buildings and Bridges, 15 June 2016 Edition.
      a. Section 4.1, first sentence: Delete "complete" and insert "showing in sufficient detail the scope of Work items" after "Specifications."
      b. Section 4.1, delete the second sentence.
      c. Section 4.3, replace every occurrence of "CAD" with "digital."
      d. Section 4.4, delete the second and third sentences.
      e. Section 4.4.2, delete this section in its entirety and replace with "Comments and markings or lack thereof on Shop Drawings or submissions do not constitute an express or implied change to the Contract Documents."
      f. Section 6.5, insert before the first sentence: "Unless otherwise noted on the Contract Documents."
      g. Section 7.14, delete in its entirety.
      h. Section 9.1.1, delete "completely."
      i. Section 9.3, delete in its entirety.
   2. AISC Specification for Structural Steel Buildings.
   3. RCSC Specification for Structural Joints Using High-Strength Bolts, 2009 Edition.
   4. AWS Structural Welding Code – Steel.
   5. SSPC Society for Protective Coatings – Steel Structures Painting Manual, Vol. 2.
   6. AISC Specification for the Design of Steel Hollow Structural Sections.
   7. AGA Inspection of Products Hot-Dip Galvanized After Fabrication.
   8. New York City Building Code, 2022, with current revisions.

H. The City of New York will engage a Special Inspector to oversee and administer, and an independent Testing Agency(s) to perform, a Program of Structural Tests and Inspections for compliance with Chapter 17 of the New York City Building Code. The Commissioner will submit New York City Department of Buildings TR-1 form, specifying the tests and inspections to be performed throughout the construction of this Project.
   1. The Special Inspector will organize and direct the test and inspection program. All inspection and test reports will be submitted to the Contractor and the Commissioner. The Contractor will be responsible for understanding the test and inspection program and notifying the Testing Agency and the Special Inspector when Work is ready for tests and/or inspections. The Contractor will provide access to the Testing Agency, Special Inspector and the Commissioner. Inspections and tests of the Program of

Structural Tests and Inspections will not relieve the Contractor of responsibility for supervision, testing, and inspection for quality control of the Work.

2. Provide testing and inspection reports to the New York City Department of Buildings when requested. Upon completion of the construction, the independent Special Inspector will make a final report on the satisfactory completion of the Program of Structural Tests and Inspections to the New York City Department of Buildings and to the Commissioner.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
   1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
   2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
   3. Load and store galvanized articles in accordance with accepted industry standards.

1.9 COORDINATION

A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.10 PREINSTALLATION CONFERENCES

A. Hold one conference at least thirty days before the start of Shop Drawings and one at least thirty days before start of erection.

B. Pre-Erection Conference. Conduct conference at Project site to comply with requirements in DDC General Conditions Section "Project Management and Coordination."
   1. Agenda to cover, but not be limited to, the following:
      a. Anchor bolt conditions.
      b. Welding procedures and welder qualifications.
      c. Bolting procedures.
      d. Methods, equipment, and sequencing of erection.
      e. Special Inspections and testing.
      f. Metal deck installation.
      g. Corrective measures in field.
   2. Pre-Erection conference attendees include, but are not limited to:
      a. Contractor.
      b. Contractor's Superintendent.
      c. Contractor's steel assistant superintendent or equivalent.
      d. Contractor's Fabricator representative.
      e. Commissioner.
      f. Special Inspection and Testing Agency.

C. Record, type, and distribute minutes of meeting to all attendees.

D. Notify attendees at least ten (10) days before the scheduled date of the conference.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992/A992M.

B. Channels, Angles, Plates. ASTM A36/A36M.

C. Hollow Structural Sections. ASTM A500, Grade B, structural tubing.

D. Welding Electrodes for All Complete Joint Penetration Welds: Will be rated as providing minimum Charpy V-Notch toughness of 20 ft-lbs at 0°F.

E. Other Welding Electrodes. Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers. ASTM A325, Type 1, heavy hex steel structural bolts; ASTM A563, heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers.
1. Finish: Hot-dip galvanized.

B. High-Strength Bolts, Nuts, and Washers. ASTM A490, Type 1, heavy hex steel structural bolts; ASTM A563, heavy hex carbon-steel nuts; and ASTM F436, hardened carbon-steel washers, plain.
1. Finish. Hot-dip galvanized.

C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH heavy-hex carbon-steel nuts; and ASTM F436, Type 1, hardened carbon-steel washers.
1. Finish: Hot-dip zinc coating.

D. Unheaded Anchor Rods. ASTM F1554, Grade 55.
1. Configuration. Straight.
2. Nuts. ASTM A563 heavy hex carbon steel.
3. Plate Washers. ASTM A36/A36M carbon steel.
4. Washers. ASTM F436 hardened carbon steel.
5. Finish. Plain.

2.3 EXPANSION ANCHORS

A. Products. Subject to compliance with requirements, provide one of the following:
1. Hilti North America, Kwik-Bolt TZ.
2. DeWalt, Power-Stud+ SD1.
3. Illinois Tool Works Inc. (ITW), Trubolt Wedge Anchor.
4. Or approved equal.

2.4 ADHESIVE ANCHORS

A. Products. Subject to compliance with requirements, provide one of the following:
1. Hilti North America, HY-270 with SafeSet system.
2. DeWalt, AC100+ Gold.
3. Illinois Tool Works Inc. (ITW), Redhead C6+.
4. Or approved equal.

2.5 THERMALLY BROKEN CONNECTIONS

A. Products. Subject to compliance with requirements, provide one of the following:
1. Schock, Isokorb.
2. Fabreeka, Fabreeka-TIM.
3. Armatherm, FRR Thermal Insulation Material.
4. Or approved equal.

2.6 PRIMER

A. Primer. SSPC-Paint 25 BCS, Type II, iron oxide, zinc oxide, raw linseed oil, and alkyd.

B. Galvanizing Repair Paint. SSPC-Paint 20, Formulated in accordance with ASTM A780.
1. Products. Subject to compliance with requirements, provide one of the following:
a. ZRC Cold Galvanizing Compound.
b. Brite Zinc by Brite Products.
c. Crown Cold Galvanizing Compound.
d. Or approved equal.

2.7 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout. ASTM C1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30 min. working time.

2.8 FABRICATION

A. Structural Steel. Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC Code of Standard Practice for Steel Buildings and Bridges and AISC Specification for Structural Steel Buildings.
1. Camber structural steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel according to ASTM A6 and maintain markings until structural steel has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting. Perform thermal cutting by machine to greatest extent possible.
1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

C. Bolt Holes. Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing. Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning. Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3 – Power Tool Cleaning.

F. Holes. Provide holes required for securing other Work to structural steel and for passage of other Work through steel framing members.
1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not enlarge holes by burning.
2. Base-Plate Holes. Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other Work.

2.9 SHOP CONNECTIONS

A. High-Strength Bolts. Shop install high-strength bolts according to RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts for type of bolt and type of joint specified.
1. Joint Type. Snug tightened.
2. Do not reuse high-strength bolts.

B. Weld Connections. Comply with AWS D1.1 for welding procedure Specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding Work.

2.10 SHOP PRIMING

A. Shop prime steel surfaces except the following:
1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 in.
2. Surfaces to be field welded.
3. Surfaces to be high-strength bolted with slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials.
5. Galvanized surfaces.

B. Surface Preparation. Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following Specifications and standards:
1. SSPC-SP 6/NACE No. 3 – Commercial Blast Cleaning.

C. Priming. Immediately after surface preparation, apply primer according to Manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.

2.11 GALVANIZING

A. Hot-Dip Galvanized Finish. Apply zinc coating by the hot-dip process to structural steel according to ASTM A123.

1. Fabricate structural steel in accordance with Class 1 guidelines as described in AGA Recommended Details for Galvanized Structures.
2. Fill all vent holes and grind smooth after fabricating.
3. Fabricate in accordance with the applicable portions of ASTM A143, ASTM A384, and ASTM A385. Avoid fabrication techniques that could cause distortion and embrittlement of the steel.
4. Consult with the Commissioner and hot-dip galvanizer regarding potential problems or potential handling problems during the galvanizing process that may require modification of design before fabrication begins.
5. Avoid using unsuitable marking paints, grease, oil paint, and other deleterious material.
6. Remove welding slag, splatter, antisplatter compounds, and burrs prior to delivery for galvanizing.
7. Remove surface contaminants and coating that would not be removable by the normal chemical cleaning process in the galvanizing operation.
8. Galvanize lintels attached to structural-steel frame and located in exterior walls. Galvanize structural steel framing in sidewalk vault.

2.12 SOURCE QUALITY CONTROL

A. The City of New York will engage an independent Testing and Inspecting Agency to perform Special Inspections and prepare test reports.
   1. Provide Testing Agency with access to places where structural-steel Work is being fabricated or produced to perform tests and inspections.

B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

C. Bolted Connections. Shop-bolted connections will be tested and inspected according to RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts.

D. Welded Connections. In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1 and the following inspection procedures, at Testing Agency's option and as indicated on Drawings:
   1. Liquid Penetrant Inspection. ASTM E165.
   2. Magnetic Particle Inspection. ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
   3. Ultrasonic Inspection. ASTM E164.
   4. Radiographic Inspection. ASTM E94.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with Contractor's steel erector present, for compliance with requirements.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 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.
   1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.4 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC Code of Standard Practice for Steel Buildings and Bridges and AISC Specification for Structural Steel Buildings.

B. Base and Bearing Plates. Coordinate this portion of the Work with the grouting Work specified under Section 03 30 00 – Cast-in-Place Concrete. Clean concrete- and masonry-bearing surfaces of bond-reducing materials and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
   1. Clean concrete- and masonry-bearing surfaces of bond-reducing materials and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
   2. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
   3. Weld plate washers to top of baseplate.
   4. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate before packing with grout.
   5. Promptly pack grout solidly between bearing surfaces and base or bearing plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with Manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

D. Splice members only where indicated.

E. Do not use thermal cutting during erection unless approved by Commissioner. Finish thermally cut sections within smoothness limits in AWS D1.1.

F. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

G. Shear Connectors. Prepare steel surfaces as recommended by Manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and Manufacturer's written instructions.

3.5 FIELD CONNECTIONS

A. High-Strength Bolts. Install high-strength bolts according to RCSC Specification for Structural Joints Using High-Strength Bolts for type of bolt and type of joint specified.
   1. Joint Type. Snug tightened.
   2. Do not reuse high-strength bolts.

B. Weld Connections. Comply with AWS D1.1 for welding procedure Specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding Work.
   1. Comply with AISC Code of Standard Practice for Steel Buildings and Bridges and AISC Specification for Structural Steel Buildings for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
   2. Grind all galvanizing masking material before making field welds.

3.6 FIELD QUALITY CONTROL

A. Special Inspection and Testing Agency. The City of New York will engage a qualified independent Testing and Inspection Agency to inspect field welds and high-strength bolted connections.

B. Bolted Connections. Shop-bolted connections will be tested and inspected according to RCSC Specification for Structural Joints Using High-Strength Bolts.

C. Welded Connections. Field welds will be visually inspected according to AWS D1.1.
   1. In addition to visual inspection, field welds will be tested according to AWS D1.1 and the following inspection procedures, at Testing Agency's option and as specified on Drawings:
      a. Liquid Penetrant Inspection. ASTM E165.
      b. Magnetic Particle Inspection. ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
      c. Ultrasonic Inspection. ASTM E164.
      d. Radiographic Inspection. ASTM E94.

D. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.7 REPAIRS AND PROTECTION

A. Galvanized Surfaces. Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A780.

B. Touchup Painting. After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories, bearing plates, and abutting structural steel.
   1. Clean and prepare surfaces by SSPC-SP 2 – Hand-Tool Cleaning or SSPC-SP 3 – Power-Tool Cleaning.
   2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

3.8 CLEANING

A. Remove and dispose of away from the site: Erection bolts, erection attachments, temporary lifting lugs, safety barrier supports, and any other auxiliary or temporary steel components that interfere with other Work.

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. The Work of this Section includes labor, materials, equipment, and services required for completion of Work under this Section as shown on Drawings and as specified herein.

B. The Work under this Section includes but is not limited to the following:
   1. Composite floor deck.
   2. Cutting and reinforcing of openings for predetermined holes and other holes required by other trades.
   3. Furnishing and installing filler plates as noted in the Drawings and as may be required to close gaps between decking and structural steel or concrete.
   4. Furnishing and installing end closures and pour stops.

C. Related Requirements: Specification Sections that directly relate to the Work of this Section include, but are not limited to, the following:
   1. Section 03 30 00 – Cast-in-Place Concrete for normal-weight and lightweight structural concrete fill over steel deck and steel reinforcement.

D. Notify all other trades responsible for installing inserts, sleeves, etc., when ready for such installation and for final checking immediately before concrete is placed. Cooperate with such trades to obtain proper installation.

1.3 REFERENCE STANDARDS

A. Follow the guidelines contained in the latest editions of the following codes, Specifications, and standards, including references contained in each Document, except where more stringent requirements are shown or specified:
   1. AISI Specification for the Design of Cold-Formed Steel Structural Members.
   2. AWS Recommended Welding Practices.
   3. Steel Deck Institute (SDI) Manual of Construction with Steel Deck No. MOC3.
   4. SDI Code of Standard Practice.
   5. ANSI/SDI C Standard for Composite Steel Floor Deck – Slabs Submittal Procedures

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.5 ACTION SUBMITTALS

A. Submit action Submittals in time to allow for review by the Commissioner and for resubmittals, if needed, without delaying the Work. Contractor is to anticipate the need for resubmittals or additional Submittals to address the Commissioner's comments and, show full compliance with the requirements of the Project Documents and New York City Construction Codes in its schedule, and provide additional time in its schedule to accommodate these requirements. Action Submittals include product data, calculations, graphical information, and physical Samples requiring Commissioner's responsive action. Do not order materials or start Work before receiving the Commissioner's written approval or review confirmation.

B. Submit the following action Submittals for review and approval:
   1. Product Data: For each type of deck, accessory, and product indicated.
   2. Shop Drawings
      a. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.
      b. Show fastening methods for deck units, accessories, closure pieces, fittings, sump pans, and the type and sequence of connections, welds, or screws.
      c. Indicate any single-span conditions requiring shoring.

C. Submit the following information Submittals for record:
   1. Product Certificates: Signed by steel deck Manufacturers certifying that products furnished comply with requirements.
   2. Welding Certificates: Copies of certificates for welding procedures and personnel.
   3. Product Test Reports: From a qualified testing agency indicating that each of the following complies with the requirements of the Contract Documents, based on comprehensive testing of current products:
      a. Mechanical fasteners.
   4. Research/Evaluation Reports
      a. Submit evidence of steel deck's compliance with the New York City Building Code.

1.6 INFORMATIONAL SUBMITTALS

A. Welding Certificates.

B. Product Certificates: For each type of steel deck.

C. Evaluation Reports: For steel deck, from ICC-ES.

D. Field Quality-Control Reports.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has a minimum of 3 yrs of experience completing steel deck similar in material, design, and extent to that indicated for this Project and whose Work has resulted in construction with a record of successful in-service performance.

B. Testing Agency Qualifications: An independent testing agency employed by the City of New York, acceptable to New York City Department of Building, qualified according to ASTM E329 for testing indicated, as documented according to ASTM E548.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M – Structural Welding Code – Sheet Steel.

1.8 PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI North American Specification for the Design of Cold-Formed Steel Structural Members.

B. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified Testing Agency. Identify products with appropriate markings of applicable Testing Agency.
   1. Indicate design designations from the UL Fire Resistance Directory or from the listings of another qualified Testing Agency.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
   1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

C. Clean metal deck and accessories of dust, grease, oils, loose materials, and any other material that impairs the adhesion of insulation and accessories, sprayed-on fireproofing, and concrete.

1.10 COORDINATION

A. Make installed deck finished surface compatible with requirements of sprayed-on deck fireproofing material.

B. Coordinate subcontractor for limiting access to deck as required for sprayed-on fireproofing to cure and adhere to the underside of deck.

C. Contractor to coordinate installation of shoring if and as required by single-span conditions indicated on the deck Shop Drawings. The floor deck is designed for two-span conditions without shoring. Single-span conditions may require shoring.

PART 2 - PRODUCTS

2.1 COMPOSITE FLOOR DECK

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Steel Deck
      a. Canam Steel Corp.
      b. Epic Metals Corporation.
      c. Nucor Corp.; Vulcraft Division.
      d. Or approved equal.

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, and with the following:
   1. Galvanized-Steel Sheet: ASTM A653/ 653M, Structural Steel (SS), Grade 50, G90 zinc coating.
   2. Profile Depth: As indicated.
   3. Design Uncoated-Steel Thickness: As indicated.
   4. Span Condition: As indicated.
   5. Side Laps: Overlapped and fastened with side-lap screws (crimped or button-punched side laps are prohibited).

2.2 ACCESSORIES

A. General: Provide Manufacturer's standard accessory materials for deck that comply with requirements indicated. Design and provide galvanized sheet steel closures and cover plates as required at columns, to close panels, and at conditions where panels change direction, abut or end, including perimeters of all stair openings, mechanical openings, slab depressions, and other areas where edge forms are required. Provide miscellaneous light angles to support closures wherever required.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated, or pneumatically-driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 50,000 psi, not less than 0.0359 in. design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 50,000 psi, of same material and finish as deck, and of thickness and profile indicated or required for application.

G. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0747 in. thick, with factory-punched hole of 3/8 in. minimum diameter.

H. Flat Sump Plates: Single-piece steel sheet, 0.0747 in. thick, of same material and finish as deck. For drains, cut holes in the field.

I. Recessed Sump Pans: Single-piece steel sheet, 0.0747 in. thick, of same material and finish as deck, with 3 in. wide flanges and level recessed pans of 1-1/2 in. minimum depth. For drains, cut holes in the field.

J. Welding Electrodes: E60XX.

K. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94% zinc dust by weight. ASTM A780/A780M.

L. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

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 of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable Specifications and commentary in SDI Publication No. 31 Code of Standard Practice, Manufacturer's written instructions, and requirements in this Section.

B. Install temporary shoring before placing deck panels if indicated on the Shop Drawings for single-span conditions or if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other Work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other Work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding Work.

I. Field Welding: Perform field welding with prequalified personnel executing prequalified procedures referenced in Quality Assurance Paragraph.

3.4 FLOOR-DECK INSTALLATION

A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:

B. Weld Diameter: 5/8 in., nominal.

C. Weld Spacing: Weld edge ribs of panels at each support. Space additional welds an average of 12 in. apart, but not more than 18 in. apart.

D. Weld Washers: Install weld washers at each weld location.

E. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports at intervals not exceeding the lesser of one-half of the span or 36 in., and as follows:
   1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.

F. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 2 in., with end joints as follows:
   1. End Joints: Butted.

G. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.

H. 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. Weld cover plates at changes in direction of floor-deck panels unless otherwise indicated.

3.5 FIELD QUALITY CONTROL AND QUALITY ASSURANCE

A. Special Inspection and Testing Agency: City of New York will engage a qualified, independent Special Inspector and Testing and Inspecting Agency to perform field tests and inspections per the New York City Building Code and prepare test reports.

B. Inspections and tests performed by the independent Special Inspector and Testing Agency do not relieve the Contractor of the responsibility of control over the quality of the Work.

C. Refer to the Special Inspections listed on the Drawings.

D. Field welds will be subject to inspection.

E. The Special Inspector and the Testing Agency will report inspection results promptly and in writing to Contractor and Commissioners within two business days and to the building official upon request.

F. Remove and replace Work that does not comply with specified requirements. The Special Inspector and the Testing Agency will reinspect all nonconforming construction and prepare a written report of the reinspection within two business days of the reinspection.

G. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

3.6 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A780/A780M and Manufacturer's written instructions.

B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation and apply repair paint.
   1. Apply repair paint of same color as adjacent shop-primed deck to bottom surfaces of deck exposed to view.

2. Wire brushing, cleaning, and repair painting of bottom deck surfaces are included in Section 09 91 00 – Painting.

C. Repair Painting: Wire brushing, cleaning, and repair painting of rust spots, welds, and abraded areas of both deck surfaces are included in Section 09 91 00 –Painting.

D. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

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. Metal Guardrails (Pipe Railings)
2. Metal ladders.
3. Prefabricated stair step unit
4. Steel framing and supports for mechanical and electrical equipment.
5. Steel framing and supports for applications where framing and supports are not specified in other Sections.
6. Miscellaneous steel associated with railings and platforms.
7. Loose bearing and leveling plates for applications where they are not specified in other Sections.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe sleeves, and inserts indicated to be cast into concrete or built into masonry.

C. Related Sections include the following:

1. 03 30 00 Cast In Place Concrete
2. 04 01 20.91 Unit Masonry Restoration
3. 05 12 00 Structural Steel Framing
4. 09 91 00 Painting

1.3 PERFORMANCE REQUIREMENTS

A. Refer to DDC General conditions section 01 40 00 “Quality requirements”.

B. Structural Performance Requirements:

1. Ladders: Ladders**,** including landings**,** must withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.
2. Railings: Railings must withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

a. Guardrails and Handrails:
   1) Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
   2) Concentrated load of 200 lbf (0.89 kN) applied in any direction.
   3) Uniform and concentrated loads need not be assumed to act concurrently.
b. Intermediate Rail:
   1) Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
   2) Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 degrees F (67 deg C), ambient; 180 degrees F (100 deg C), material surfaces.
2. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1.4 SUBMITTALS

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures.”

B. Product Data: Submit manufacturer's technical data for the following:

1. Guardrails
2. Prefabricated stair step unit
3. Paint products
4. Grout

C. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Provide Shop Drawings for the following:

   a. Metal Guardrails (Pipe Railings)
   b. Metal ladders and ladder safety cages.
   c. Prefabricated stair step unit
   d. Steel framing and supports for mechanical and electrical equipment.
   e. Steel framing and supports for applications where framing and supports are not specified in other Sections.

2. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

   a. Indicate locations of field splices where required.
   b. Show relationship with adjacent construction where metal fabrications are required to be built-in or attached to.
   c. Provide templates for anchors and bolts specified for installation under other Sections.

D. Design Analysis: Submit structural analysis data for design of ladders and railings indicating compliance with specified performance requirements, signed and sealed by the qualified professional engineer licensed in the State of New York responsible for their preparation.

E. Qualification Data: Submit for qualified professional engineer licensed in the State of New York and fabricator to demonstrate their capabilities and experience; include documentation indicating compliance with specified qualification requirements. Submit for Commissioner's information only.

F. Welding Certificates: Submit copies of certificates for welding procedures and personnel. Submit for Commissioner's information only.

G. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats. Submit for Commissioner's information only.

H. Research/Evaluation Reports: Submit ICC-ES reports for post-installed anchors.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 "Quality Requirements."

B. Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce the required units.

1. Fabricator/Installer must have minimum Three (3) years' experience in the satisfactory production and installation of fabrications of similar design and complexity as required for this Project.

C. Welding Qualifications: Each welder must be certified for welding processes involved and have satisfactorily passed AWS qualification tests and, if pertinent, has undergone recertification. Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3, "Structural Welding Code - Sheet Steel."
3. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
4. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

D. Professional Engineers Qualifications: A professional engineer licensed in the State of New York who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installation of ladders and railings that are similar to those indicated for this Project in material, design, and extent.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with

metal fabrications by field measurements before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements.

1.7 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate fabrication requirements with installation work to which items specified in this section are to be attached or mounted to other construction.

C. Coordinate installation of anchorages, including steel weld plates and angles for casting into concrete, for attachment of metal fabrications.

1. 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.
2. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METAL MATERIALS

A. Metal Surface Quality: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

D. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.2 FASTENERS

A. General Requirements: Unless otherwise indicated, provide Type 304 or Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls.

1. Select fasteners for type, grade, and class required.
2. Provide the following type fasteners for indicated applications:

a. For fastening aluminum: Stainless-steel fasteners.
b. For fastening stainless steel: Stainless-steel fasteners.
c. For fastening bronze: Bronze fasteners.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3 (ASTM A 325M, Type 3); with hex nuts, ASTM A 563, Grade C3 (ASTM A 563M, Class 8S3); and, where indicated, flat washers.

D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593 (ASTM F 738M); with hex nuts, ASTM F 594 (ASTM F 836M); and, where indicated, flat washers; Alloy Group 1 (A1).

E. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers. Provide Hot dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

F. Cast-in-Place Anchors in Concrete: Anchors of type specified, fabricated from corrosion-resistant materials capable of sustaining, without failure, the load imposed within a safety factor of 4, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47 (ASTM A 47M) malleable iron or ASTM A 27/A 27M cast steel.
2. Provide bolts, washers, and shims as needed, hot dip galvanized per ASTM F 2329.

G. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

1. Interior Applications: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
2. Exterior Applications and Where Stainless Steel Is Required: Alloy Group 1 (A1) or Group 2 (A4) stainless-steel bolts complying with ASTM F 593 (ASTM F 738M), and nuts complying with ASTM F 594 (ASTM F 836M).

2.3 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

B. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

E. Non-shrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Concrete Fill: Provide concrete materials and properties complying with Division 3 Section "Cast-in- Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa), unless otherwise indicated.

2.4 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations.

1. Use connections that maintain structural value of joined pieces.
2. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges, true to line and level.

E. Weld corners and seams continuously to comply with the following:

1. Perform welds according to AWS specifications.
2. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
3. Obtain fusion without undercut or overlap.
4. Remove welding flux immediately.
5. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2-by-38-mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8-inches (200-mm) from ends and corners of units and 24-inches (600-mm) on center, unless otherwise indicated.

K. Fabricate joints that will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.

L. Remove sharp or rough areas on exposed traffic surfaces.

M. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

2.5 METAL LADDERS

A. Design and Construction Standards:
1. Comply with ANSI A14.3.

B. Steel Ladders:

1. Siderails: Continuous, 3/8-by-2-1/2-inch (9.5-by-64-mm) steel flat bars, with eased edges.
2. Ladder Rungs:

a. Products: Subject to compliance with requirements, provide one of the following:
1) Alabama Metal Industries Corporation (AMICO); Safety-Tread.
2) Cooper B-Line - GS Metals Corp.; Traction Tread.
3) Morton Manufacturing Co.; Tread-Grip.
4) Or approved equal.
b. Characteristics: Channel-shaped, heavy gauge sheet metal sections with perforated dimples on web to produce raised slip-resistant surface and drainage holes.
1) Material: 0.089–inch (13-gauge) (2.28-mm) minimum thickness steel sheet meeting ASTM A 1011.
2) Channel Rung Size: 1.625-inch (1-5/8") (42-mm) width by 1.125-inch (1-1/8") (29-mm) height, nominal.

3. Brackets: Fabricated from same metal material as ladder; sized to support design loads specified in ANSI A14.3 and provide at least 7-inch (178-mm) clear distance projecting away from wall surfaces when mounted.
4. Ladder Fabrication:
a. Space siderails 18 inches (1'-6") (457-mm) apart, unless otherwise indicated.

b. Fit rungs in centerline of side rails; continuous weld and grind smooth. Space rungs at 12-inches (300-mm) on center.
c. Support each ladder at top and bottom and not more than 60 inches (5'-0") (1500-mm) on center with welded or bolted brackets.
d. Provide platforms as indicated fabricated from welded or pressure-locked steel bar grating, supported by steel angles. Limit openings in gratings to no more than 1/2-inch (12-mm) in least dimension.

5. Finish:

a. Exterior Locations: Galvanize ladders including brackets and fasteners.

b. Interior Locations: Prime paint ladders including brackets and fasteners.

2.6 PREFABRICATED STAIR STEP UNIT

A. Provide prefabricated stair step unit, with 28” vertical clearance, with 30” x 48” platform as indicated on the drawings by one of the following:
B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Grainger
2. Global Industrial
3. Diverse Supply, Inc.
4. Or approved equal.

C. Stair step unit to be securely fastened to surface below.
D. Stair step unit must include OSHA approved safety rails.

2.7 MISCELLANEOUS FRAMING AND SUPPORTS

A. Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Cut, drill, and tap units to receive hardware, hangers, and similar items.
2. Furnish inserts for units installed after concrete is placed.

C. Provide framing and bracing members to support plumbing, mechanical, electrical and electronic systems equipment and coordinate sizing and fabrication of members required with work specified.

D. Finish:

1. Galvanize miscellaneous framing and supports where indicated to be installed at exterior locations.
2. Prime miscellaneous framing and supports with specified primer where indicated to be

installed at interior locations except where otherwise specified.

2.8 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

C. Finish:

1. Galvanized for exterior locations.
2. Prime painted for interior locations.

2.9 FINISHES

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

C. Steel and Iron Finishes:

1. Galvanizing: Hot dip galvanize items as indicated complying with the following specified standards:

a. ASTM A 123/A 123M, for galvanizing steel and iron products.
b. ASTM A 153/A 153M, for galvanizing steel and iron hardware.\

2. Shop Priming:

a. Surface Preparation
1) Uncoated Ferrous-Metal: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
a) Exteriors (SSPC Zone 1B): SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
b) Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
2) Preparation for Shop Priming Galvanized Items:
a) After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
b) Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
b. Primer application: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those embedded in concrete, sprayed-on

fireproofing, or masonry, unless otherwise indicated.

1) Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
2) Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

3.3 INSTALLING MISCELLANEOUS FRAMING, SUPPORTS AND OTHER METAL

FABRICATED ITEMS

A. Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Overhead Framing, Bracing and Supports: Install overhead framing and bracing to support equipment and construction as indicated, or where required by equipment manufacturer but not furnished as part of their work.

C. Vertical Ladders: Anchor ladder at top and bottom and at 5'-0" (1524 mm) vertical centers, maximum, with brackets welded to siderails and attached to substrate or framing.

1. Attach brackets supports as follows:

a. Anchor to masonry or concrete substrates with expansion anchors.
b. Anchor to heavy gauge steel framing by thru-bolting, reinforced and braced with back-up plates and secured in place with nuts and lock washers.

2. Hold ladder 7-inches (178-mm) from vertical surface to which it is attached unless otherwise indicated.

3.4 ADJUSTING AND CLEANING

A. Remove dust, dirt and debris from metal fabrications upon completion of installation. Clean metal surfaces free of contaminants.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas.

1. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
2. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 05 50 00

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. Framing with dimension lumber.
2. Rooftop equipment bases and support curbs.
3. Wood blocking and nailers.

1.3. DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

B. Dimension Lumber: Lumber of two inches nominal size or greater but less than 5 inches nominal size in least dimension.

C. Exposed Framing: Framing not concealed by other construction.

1.4. SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5. SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.6. INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Engineered wood products.
4. Power-driven fasteners.
5. Post-installed anchors.
6. Metal framing anchors.

1.7. QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.8. DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1. WOOD PRODUCTS, GENERAL

A. Lumber: Comply with DOC PS 20 and ALSC Board of Review-certified agency grading.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
3. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2. WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.

1. Preservative Chemicals: Acceptable to the Commissioner and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. Application: Treat items indicated on Drawings and the following:

a. Items in contact with roofing or waterproofing.
b. Items in contact with concrete or masonry.
c. Framing less than 18 in. aboveground in crawlspaces.
d. Floor plates installed over concrete slabs-on-grade.

2.3. FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials will comply with requirements in this article, which are acceptable to the Commissioner, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Treatment will not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials will comply with requirements specified above for fire-retardant- treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials will have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.

C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

E. For exposed items indicated to receive a stained or natural finish, chemical formulations will not bleed through, contain colorants, or otherwise adversely affect finishes.

F. Application: Treat all rough carpentry unless otherwise indicated.

2.4. MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.
7. Utility shelving.

B. Dimension Lumber Items: Construction or No. 2 grade or better, kiln dried lumber of the

following species:

1. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.5. METAL FRAMING ANCHORS

A. Allowable design loads, as published by manufacturer, will meet, or exceed those indicated. Manufacturer's published values will be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors will be punched for fasteners adequate to withstand same loads as framing anchors.

B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

1. Use for interior locations unless otherwise indicated.

C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.

1. Use for wood-preservative-treated lumber and where indicated.

D. Stainless-Steel Sheet: ASTM A 666, Type 304.

1. Use for exterior locations and where indicated.

2.6. MISCELLANEOUS MATERIALS

A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

PART 3 – EXECUTION

3.1. EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2. INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

D. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

E. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

F. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

G. Do not splice structural members between supports unless otherwise indicated.

H. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

I. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 in. o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 in. o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2 in. nominal thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq ft and to solidly fill space below partitions.
4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 ft o.c.

J. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

K. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

L. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
3. ICC-ES evaluation report for fastener.

M. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.3. WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

3.4. PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 10 00

SECTION 07 52 00 –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. Performance Requirements.
2. Submittal Procedures.
3. Project Conditions.
4. Quality Assurance.
5. Warranty.
6. Execution.
7. Cleaning and Protection.

B. Related Sections.
1. Section 07 62 00 – Sheet Metal Flashings.
2. Division 22 "Plumbing."

C. Summary of Work.
1. Provide temporary protection for the duration of the Work to protect adjacent structures and interior finishes or exterior materials to remain.
2. Remove all residue, dirt, and debris from the Work area prior to installation of the new materials.
3. Survey the concrete slab and report any damage to the Commissioner.
4. For all systems described, provide the following components and their subcomponents of Work including, but not limited to:
    a. Install new roofing system including the following components:
        1) Two-ply modified bitumen roofing system set in cold adhesive.
        2) Cover board.
        3) Rigid insulation.
        4) Fully adhered air/vapor barrier.
        5) Mechanically fastened cover board (refer to the Drawings for locations).
        6) Sheet and fluid-applied flashing membranes and accessories at all penetrations, walls, parapets, curbs, and other features on the roof deck for the roofing system.
        7) Sealants.

1.3 PERFORMANCE REQUIREMENTS

A. Reference Standards and Regulations
1. The Contractor's design, materials, and workmanship is to comply with current codes listed below. Comply with and obtain all necessary approvals from the New York City Department of Buildings. Where their recommendations or requirements are to a lower standard than required by this Contract Document, this Document is to take precedence. Local codes include the following with the most recent amendments and their references, and are referred to as "Code" in this Section:
   a. 2022 New York City Building Code – General Administrative Provisions.
   b. 2020 New York City Energy Conservation Code.
2. Comply with applicable provisions and recommendations of the standards listed below. Where standards conflict or conflict with the provisions of these Specifications, the more stringent are to apply. Unless otherwise noted, the latest editions of the standards are to apply:
   a. ASTM International (ASTM)
      1) ASTM A240/A240M – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
      2) ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
      3) ASTM C794 – Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
      4) ASTM C920 – Standard Specification for Elastomeric Joint Sealants.
      5) ASTM C1021 – Standard Practice for Laboratories Engaged in Testing of Building Sealants.
      6) ASTM C1193 – Standard Guide for Use of Joint Sealants.
      7) ASTM C1247 – Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids.
      8) ASTM C1248 – Standard Test Method for Staining of Porous Substrate by Joint Sealants.
      9) ASTM C1330 – Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
      10) ASTM C1521 – Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
      11) ASTM D4258 – Standard Practice for Surface Cleaning Concrete for Coatings.
      12) ASTM D4259 – Standard Practice for Abrading Concrete.
      13) ASTM D4479 – Standard Specification for Asphalt Roof Coatings – Asbestos Free.
      14) ASTM D4541 – Standard Test Method for Pull-Off Strength of Coatings using Portable Adhesion Tester.
      15) ASTM D4586 – Standard Specification for Asphalt Roof Cement, Asbestos Free.
      16) ASTM D7877 – Standard Guide for Electronic Methods for Detecting and Locating Leaks in Waterproof Membranes.
      17) ASTM E108 – Standard Test Methods for Fire Tests of Roof Coverings.
   b. Code of Federal Regulations (CFR)
      1) 40 CFR Part 59, Subpart D – National Volatile Organic Compound Emission Standards for Architectural Coatings.
   c. International Concrete Repair Institute (ICRI)
      1) ICRI Guideline 03732 – Concrete Surface Preparation.
   d. National Roofing Contractors Association (NRCA)
      1) NRCA Roofing and Roofing Manual.
   e. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
      1) SMACNA Architectural Sheet Metal Manual.

f. Revere Copper Products, Inc.
   1) Copper and Common Sense.
g. Underwriters Laboratories Inc. (UL)
   1) UL 580 – Standard for Tests for Uplift Resistance of Roof Assemblies.
   2) UL 790 – Standard Test Methods for Fire Tests of Roof Coverings.

B. General Prescriptive Requirements.
1. Provide two-ply modified bitumen roofing system as shown on the Drawings and as specified herein and Related Sections.
2. Use materials in the Contract Work chemically compatible with their adjacent materials.
3. Site-applied Sealant is to not be acceptable as part of the primary weather sealing system unless approved by the Commissioner or noted within this Section.
4. Provide Sealants where indicated on the Drawings and specified in the Related Sections for each Referenced System and incorporated material.

C. General Performance.
1. Install two-ply modified bitumen roofing system according to the intended use appropriate standards, as specified herein, and per the manufacturer's recommendations.
   a. A qualified Contractor must install the specified roofing system.
2. Install Sealants according to the intended use, appropriate standards, and per the manufacturer's recommendations.
3. Liquid-Applied Joint Sealants
   a. Comply with ASTM C920 and other requirements indicated for each liquid-applied joint Sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.
   b. Suitability for Immersion in Liquids: Where Sealants are indicated for use in joints that will be continuously immersed in liquids, provide products that have been tested according to ASTM C1247. Liquid used for testing Sealants is to be representative of Project conditions unless otherwise indicated.
4. VOC Content of Interior Sealants: Comply with the following limits for VOC content of Sealants and Sealant primers used inside the weatherproofing system when calculated according to 40 CFR Part 59, Subpart D (EPA Method 24):
   a. Architectural Sealants: 250 g/L.
   b. Sealant Primers for Nonporous Substrates: 250 g/L.
   c. Sealant Primers for Porous Substrates: 775 g/L.

D. Durability Performance.
1. Two-ply modified bitumen roofing system must withstand degrading effects of radiation from the sun, weathering, atmospheric pollution, vermin, fungi, and other growths for the required service life without maintenance. All surfaces must be covered and protected to prevent damage to the membrane.
2. Provide tapered insulation as specified herein and per approved tapered insulation Shop Drawing to adequately drain water to roof drains and to prevent excess water accumulation on the roofing membrane. Tapered insulation is not required where the existing roof deck has adequate slope to drain (minimum 1/8 in. per foot).
3. Provide temporary protection to protect the membrane from damage during construction, installation of surrounding flashings, and cladding components.
4. Failure includes inability of the Contract Work to meet the performance requirements set forth in this and all Related Sections in addition to the following:

a. Wrinkles/blisters in the roofing membrane and flashings.
b. Degradation of the roofing membrane from radiation exposure from the sun.
c. Adhesive or cohesive failure of the roofing membrane.
d. Improperly installed mechanical fasteners.
e. Gaps in the seams of the roofing membrane and flashings.
f. Loss of wind uplift resistance as required by the Code and these Specifications.

5. Use Sealant products that withstand the specified deleterious and degrading effects of radiation from the sun, weathering, atmospheric pollution, vermin, fungi, and other growths for the required service life, without maintenance in excess of routine cleaning and minor repairs.
6. Failure includes inability of the Sealant to meet the performance requirements set forth in this and all Related Sections, in addition to the following:
   a. Adhesive or cohesive failure of Sealants.
   b. Crazing on surface of Sealant.
   c. Non-structural Sealant hardening beyond Shore A Durometer 50 or softening below Durometer 20.

E. Compatibility Performance.
1. Provide joint Sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint Sealant manufacturer, based on testing and field experience.
2. Stain-Test-Response Characteristics: Where Sealants are specified to be non-staining to porous substrates, provide products tested according to ASTM C1248 and that have not stained porous joint substrates indicated for Project.

F. Structural Performance.
1. The Contract Work must transmit the design loads as specified below to the building structure via the points of attachment as designed and built, with an adequate margin of safety appropriate to each material and product as required by Code and the listed Reference Standards.
   a. Refer to the Drawings for wind loads.
2. As required by Code, the various load cases and combinations of load cases acting on structural elements are to be considered.
   a. No permanent deformation or damage to any components of the Contract Work, adjacent elements, or supporting structure is to be accepted under any of the above load cases and combinations of load cases, excluding blast and impact loads.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 SUBMITTALS

A. Action Submittals.
1. Shop Drawings
   a. Provide a tapered insulation Shop Drawing showing the proposed layout of the tapered insulation and crickets at the main roof level and any other roof area with a flat roof deck. Where the roof deck is sloped to drain, show the roof slope and cricket locations.

b. The Shop Drawings must be based on field measurements of all drains and obstructions. Shop Drawings must include all roof penetrations, dunnage, bulkheads, skylights, roof access doors, and any other roof features.
c. Provide roof plan Drawings showing proposed layout of all roofing components from the roof deck to roofing membrane, indicating their respective attachment methods per the manufacturer's instructions that meet the Code required wind uplift pressures.
   1) Indicate all fastener locations and spacing on Drawings.
   2) Provide adhesive and primer application rates and locations in the roofing assembly for adhered layers.
d. Details showing all unique roof conditions, including but not limited to typical roofing assembly, parapets, rising wall base flashings, penetration flashings, mechanical curb flashings, roof edge gravel stop, gutters, and downspouts, etc.
e. Details of all flashings, edge metal, copings, etc., showing profile, lengths, joints terminations, and methods of attachment. Coordinate with Shop Drawings specified in the Related Sections.
f. Submit all other details required by the Commissioner, including isometric details.
g. Crack and Damage Survey: Perform a crack and damage survey of the structural concrete deck and topping slabs and show the results of the survey on a roof plan.

2. Product data, including safety data sheets (SDS) for all materials.
3. Manufacturer's installation instructions.
4. Samples
   a. Provide Samples for all products used for the Contract Work. Provide a minimum of a 6 in. x 6 in. Sample except where products are less than 6 in. in one dimension where a 6 in. long sample is to be provided.
   b. Sealant Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured Sealants showing full range of colors available for each product exposed to view.
   c. Sealant Samples for Verification: For each kind and color of joint Sealant required, provide three Samples with joint Sealants in 1/2 in. wide joints formed between two 6 in. long strips of material matching the appearance of exposed surfaces adjacent to joint Sealants.
   d. Provide two tubes of each type of Sealant used on the Project to the Commissioner.
5. Quality Control Plan
   a. Work Sequence Plan: Provide a comprehensive Work sequence plan showing areas where Work will be performed by trades involved in each area and time required to complete each area. Do not commence Work until receiving Commissioner's written approval of the Work sequence plan. Indicate ELD testing in the sequence plan. The plan must include the following as a minimum:
      1) Notify the Commissioner in writing at least 72 hrs prior to the initial installation of the roofing system.
      2) Inspect conditions and materials to ensure conformity to the Contract requirements.
      3) Roof installer must inspect substrate conditions and coordinate with the Contractor to ensure proper substrate preparation in conformance to the manufacturer's requirements and Contract requirements.
      4) Inspect Work in progress to ensure that the Work is in compliance with approved procedures.
      5) Inspect all completed and any corrected Work for compliance with the Contract Documents and the membrane manufacturer's recommendations.
   b. Provide results of moisture content tests on the concrete substrates to confirm that the concrete moisture content is in accordance with the roofing manufacturer's requirements. Contractor to

engage the services of a qualified, independent testing agency to perform testing. At a minimum, tests must comply with the roofing system manufacturer's recommendations for testing.

6. Warranty Coordination: Contractor is to be responsible for all coordination necessary for the installed roof system to qualify for the specified Warranty. This includes manufacturer review of the roof Drawings and Specification, and coordination of all necessary site visits / inspections by the manufacturer.

B. Information Submittals
   1. Product Test Reports
      a. Indicating compliance with performance requirements as required and specified in Related Sections. For Sealants, Product Test Reports based on evaluation of comprehensive tests. Contractor to engage the services of a qualified, independent testing agency to perform testing, indicating that Sealants comply with requirements.
      b. Sealant Pre-Construction Compatibility and Adhesion Test Reports: From Sealant manufacturer, indicating the following:
         1) Materials forming joint substrates and joint Sealant backings have been tested for compatibility and adhesion with joint Sealants.
         2) Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
      c. Sealant Pre-Construction Field-Adhesion Test Reports: Indicate which Sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in Pre-Construction Compatibility and Adhesion Testing.
      d. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each Sealant specified to be validated by SWRI's Sealant Validation Program.
   2. Quality Control Reports
      a. Manufacturer site visit reports.
      b. Field reports by Contractor and/or other third-party inspectors.
      c. Results of adhesion tests on the substrate to confirm that the roofing membrane is adhered in accordance with the manufacturer's requirements. Tests are to be conducted by a technical representative from the roofing manufacturer or a qualified Independent Testing Agency hired by the Contractor and, at minimum, must comply with the roofing system manufacturer's recommendations for testing.
   3. Manufacturer's Certification: Written certification (in time to prevent delay of the Contract Work) by the manufacturers of the roofing materials that the materials supplied to the Contractor for this Project comply with all requirements of the ASTM standards, and that all materials are suitable for the uses specified herein.
   4. Maintenance Data: For roofing system to include in maintenance manuals.
   5. Protection Plan: Written procedures and plans for providing temporary roofing and protection of areas that will be exposed to weather, traffic, etc., prior to the installation of the complete roofing system.
   6. Drying Plan: Written procedures and plans for unpackaging and drying cover board and rigid insulation prior to installation.

C. Closeout Submittals.
   1. Warranties.
   2. As-built Shop Drawings.

1.6 PROJECT CONDITIONS

A. Comply with all manufacturers requirements and the requirements listed in these Specifications. Where the manufacturer's requirements and these Specifications conflict, comply with whichever is more stringent.

B. Provide 72 hr advance notice if roof-mounted equipment, ductwork, or conduits must be removed to permit roofing operations.

C. Do not apply the roofing during or with the threat of inclement weather. Proceed with installation only when existing and forecasted weather conditions permit roofing systems to be installed according to manufacturer's written instructions and Warranty requirements:
   1. Do not install if wind is gusting more than 15 mph or interferes with proper installation.
   2. Application of Contract Work may proceed while air temperature is between 40°F and 85°F, providing the substrate is a minimum of 5°F above the dewpoint, or as required by the manufacturer.
   3. When ambient temperatures are at or expected to fall below 50°F, or reach 85°F or higher, follow Manufacturer's recommendations for weather-related additives and application procedures, if such recommendations are available.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

E. Ensure that substrate materials are dry and free of contaminants. Do not commence with the application unless substrate conditions are suitable. Contractor is to demonstrate that substrate conditions are suitable for the application of the materials.

F. Where required by the City of New York or the Commissioner, Contractor must implement odor control and elimination measures prior to and during application of the roofing materials. Implement odor control measures at no additional cost to the City of New York. The Contractor must include with its proposal odor control and elimination measures.
   1. Control/elimination measures are to be field tested at off-hours and typically consists of one (1) or a multiple of the following measures:
      a. Seal air intakes with activated carbon filters. Install filters in accordance with requirements and recommendations of the filter manufacturer. Seal filters at joints and against building exterior walls to prevent leakage of unfiltered air.
      b. Seal doorways, windows, and skylights with duct tape and polyethylene sheeting to prevent leakage of air into the building.
      c. Erect and use moveable enclosure(s) sized to accommodate Work area(s) and stationary enclosure for resin mixing station. Enclosure is to be field constructed or pre-manufactured of fire-retardant materials in compliance with New York City Building Code Section 3309. Provide equipment enclosure(s) with mechanical air intake/exhaust openings and odor control air cleaners, as required to clean enclosed air volume and to prevent odor migration outside the enclosure. Seal exhaust opening with activated carbon filter.
      d. Protection of Contractor personnel and occupants of the structure and surrounding buildings as necessary to comply with requirements of OSHA, NIOSH, and/or New York City Department of Buildings.

G. Do not proceed with installation of joint Sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint Sealant manufacturer or are below 40°F.
2. When joint substrates are wet.
3. Where joint widths are less than those permitted by joint Sealant manufacturer for applications indicated. Notify Commissioner of condition.
4. Where contaminants capable of interfering with adhesion have not been removed from joint substrates.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Field Inspection Services: Installer is to arrange with the manufacturer to have the services of a properly trained manufacturer's field representative at the Project site. The manufacturer's field representative is to review the substrate conditions, instruct Work crews in the proper mixing and application procedures, and provide written recommendations to the Commissioner regarding special conditions related to the Work and corrective action to observed Work that does not conform to the manufacturer's installation or Warranty requirements. At a minimum, the manufacturer's technical representative is to provide the following inspections of the membrane:
   1. Project start inspection at the beginning of each phase of the Project to review special detailing conditions and substrate preparation.
   2. Periodic in-progress inspections throughout the Project to evaluate membrane and flashing application.
   3. Final punch-list inspection at the completion of each phase of the Project, including probing all seams.
   4. Warranty inspection to confirm completion of all punch-list items, surfacing, and overburden application.
   5. The manufacturer's field representative is to provide the Contractor, Commissioner, and the City of New York with written reports after each site visit outlining observations and required corrections from each site visit to comply fully with the manufacturer's installation and Warranty requirements.

C. Single Source: Obtain materials through one source from a single manufacturer for the Contract Work. Products from alternate manufacturers must be approved in writing by the primary manufacturer.

D. Moisture Content: Evaluate moisture content of substrate materials. Installer is to determine substrate moisture content throughout the Work and record with daily inspection reports or other form of reporting acceptable to the City of New York and membrane manufacturer. Concrete substrates must meet the manufacturer's requirements for moisture content.
   1. Installer is to perform qualitative moisture testing of the concrete deck according to ASTM D4263 ("plastic sheet" method).

E. Coordination and Sequencing: Complete membrane flashings prior to field membrane installation.

F. Sealant Testing Agency Qualifications: Contractor to engage the services of a qualified, independent testing agency to perform testing according to ASTM C1021.
   1. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by ASTM C920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

G. Sealant Product Testing: Contractor to engage the services of a qualified, independent testing agency to perform testing of joint Sealants.

H. Sealant Pre-Construction Compatibility and Adhesion Testing
   1. Test results confirming compatibility and adhesion are mandatory for all concealed and exposed Sealant materials in contact with all adjacent materials including but not limited to glazing, other Sealants, flashings, metal framing, shims prior to mockup, and testing constructions.
   2. Submit to joint Sealant manufacturers, for testing indicated below, Samples of materials from Related Sections that will contact or affect joint Sealants.
      a. Use ASTM C1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint Sealants to joint substrates.
      b. Submit not fewer than eight (8), but no less than requested by the Sealant manufacturer, pieces of each kind of material, including joint substrates, shims, joint Sealant backings, secondary seals, and miscellaneous materials.
      c. Schedule sufficient time for testing and analyzing results to prevent delaying the Referenced System in Related Sections.
      d. For materials failing tests, obtain joint Sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
      e. With Commissioner's approval, testing will not be required if joint Sealant manufacturers submit joint preparation data based on previous testing, not older than twenty-four (24) months, of Sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

I. Sealant Pre-Construction Field-Adhesion Testing: Before installing Sealants, field test their adhesion to Project joint substrates as follows:
   1. Locate test joints where indicated on Project or, if not indicated, as directed by Commissioner.
   2. Provide testing for prefabricated components described in Related Sections prior to Project fabrication.
   3. Conduct field tests for each combination of utilized substrate type and Sealant type.
   4. Notify Commissioner seven (7) days in advance of dates and times when test joints will be erected.
   5. Arrange for tests to take place with joint Sealant manufacturer's technical representative present.
   6. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in ASTM C1193, Tail Procedure, in ASTM C1521.
      a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
   7. Report whether Sealant failed to adhere to joint substrates or tore cohesively, and the sealant elongation at the time of failure. Include data on pull distance used to test each kind of product and joint substrate. For Sealants that fail adhesively, retest until satisfactory adhesion is obtained.
   8. Evaluation of Pre-Construction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use Sealants that fail to adhere to joint substrates during testing.
      a. Note a passing result without use of primer does not eliminate the need for all sealant substrate types to receive primer unless the manufacturer states in writing that use of primer will negatively affect the Sealant's long-term performance.

J. Special Experience Requirements:
   1. Installer Qualifications: An entity meeting the requirements of DDC General Conditions Section 014000 1.7/C/3.

1.8 WARRANTY

A. Manufacturer's Full Assembly Premier Warranty: Provide 20-yr manufacturer's roofing Warranty under provisions of this Section from Substantial Completion. This roofing Warranty provides for cost of labor and materials for loss of watertightness, limited to amounts necessary to effect repairs necessitated by either defective material or defects in related installation workmanship, with no dollar limitation ("NDL"). The Warranty must also include all layers of the roofing system when they are supplied or approved by membrane manufacturer and installed in accordance with manufacturer's general installation guidelines. Warranty to cover failures up to the design wind speed.

PART 2 - PRODUCTS

2.1 ROOFING SYSTEM MANUFACTURER

A. Basis-of-Design System Manufacturer: Subject to compliance with requirements, provide two-ply SBS-modified bitumen roofing system by Siplast, Inc. (Siplast) or comparable product by one of the following:
   1. Soprema Inc.
   2. Johns Manville.
   3. Or approved equal.

2.2 ROOFING MEMBRANE

A. Basis-of-Design Product: Subject to compliance with requirements, provide Modified Bitumen Roofing System of two-ply SBS modified bitumen system with base ply set in cold adhesive and granule surface cap sheet applied in cold adhesive by Siplast including the following products:
   1. Base Ply: Paradiene 20, suitable for cold adhesive application.
   2. Adhesive Grade Top Ply: Paradiene 30 FR, with standard white granules, suitable for cold adhesive application.
   3. Strip Flashing for Adhesive Applications: Paradiene 20.

B. Or provide comparable product by one of the following:
   1. Soprema Inc.
   2. Johns Manville.
   3. Or approved equal.

2.3 VAPOR RETARDER

A. Basis-of-Design Product: Subject to compliance with requirements, provide Irex 40 by Siplast, or a comparable product by one of the following as part of an approved system:
   1. Soprema Inc.
   2. Johns Manville.
   3. Or approved equal.

2.4 FLASHING MATERIALS

A. Base and Wall Flashing Underlayment:
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Paradiene 20 by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

B. Aluminum-Faced Base and Wall Flashing Top Sheet:
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Veral Aluminum by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

C. Granule-Surfaced Base and Wall Flashing Top Sheet:
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Paradiene 40 FR by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

D. Fluid Flashing Assembly Resin for Flashing Applications: A multi-component, flexible polymethylmethacrylate (PMMA) based resin combined with a thixotropic agent for use in combination with fleece fabric to form a monolithic reinforced flashing membrane.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Parapro 123 Fluid Reinforced Flashing System, by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

E. Basis-of-Design Reinforced Fluid Applied PMMA Flashing System Catalyst: A reactive agent used to induce curing of PMMA resins.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Pro Catalyst, by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

F. Fleece for Membrane and Flashing Reinforcement: A non-woven, needle punched polyester fabric reinforcement as supplied by the membrane system manufacturer.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Pro Fleece, by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

G. Resin for Flashing Applications: A multicomponent, flexible, PMMA based resin combined with a thixotropic agent for use in combination with fleece fabric to form a monolithic, reinforced flashing membrane.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Parapro Flashing Resin, by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

2.5 ROOFING ADHESIVES

A. Adhesive used to be selected based upon the manufacturer's written recommendations and the results of field adhesion testing:
   1. Membrane Cold Adhesive (Solvent Free): A blend of special urethane moisture cured, solvent free adhesive that meets or exceeds ASTM D4479, Type II requirements. This adhesive must be used where the PMMA membrane will lap over the membrane.
      a. Basis-of-Design Product: Subject to compliance with requirements, provide SFT Adhesive, by Siplast, or a comparable product by one of the following as part of an approved system:
         1) Soprema Inc.
         2) Johns Manville.
         3) Or approved equal.
   2. Membrane Cold Adhesive: A blend of special adhesive asphalts and safe, high flash, quick drying solvents that meets or exceeds ASTM D4479, Type II requirements.
      a. Basis-of-Design Product: Subject to compliance with requirements, provide PA-311 Adhesive, by Siplast, or a comparable product by one of the following as part of an approved system:
         1) Soprema Inc.
         2) Johns Manville.
         3) Or approved equal.

B. Flashing Cement: A blend of special urethane moisture cured, solvent free roof cement with non-asbestos fibers conforming to ASTM D4586, Type II requirements.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide SFT Cement, by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

C. Bituminous Cutback Materials Primer: A high flash, quick drying, asphalt solvent blend which meets or exceeds ASTM D41 requirements.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide PA-917LS Asphalt Primer, by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

D. Bituminous Cutback Materials Mastics: An asphalt cutback mastic, reinforced with non-asbestos fibers, used as a base for setting metal flanges conforming to ASTM D4586 Type II requirements.

1. Basis-of-Design Product: Subject to compliance with requirements, provide PA-1021 Plastic Cement, by Siplast, or a comparable product by one of the following as part of an approved system:
   a. Soprema Inc.
   b. Johns Manville.
   c. Or approved equal.

2.6 FLUID APPLIED ROOFING ACCESSORIES

A. Tools and Accessories: Supplied and/or approved by membrane manufacturer for product installation.

B. Cleaner Solution/Solvent: A clear solvent used to clean and prepare transition areas of in-place catalyzed resin to receive subsequent coats of resin and to clean substrate materials to receive resin.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Pro Prep, by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

C. Patching, Filling, and Smoothing Resin/Paste: Two-component, with catalyst, cold fluid-applied PMMA paste for remediation of depressions, small cracks, voids and other irregularities in substrate surfaces prior to the application of the waterproofing system or used as a leveling layer at fleece overlaps of reinforcement.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Pro Paste Resin, by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

D. Repair Mortar: A two component, PMMA-based, aggregate-filled mortar used for patching concrete substrates.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Pro Mortar, by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

E. PMMA Primer for Concrete (vertical)/Masonry/Wood/Fiberglass-Faced Gypsum Board/Plywood Substrates: A two component, PMMA-based primer for use over concrete, concrete repair materials, masonry substrates and wood/plywood substrates:
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Pro Primer W, by Siplast, or as recommended by roofing manufacturer, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

F. PMMA Primer for Concrete (horizontal): A two component, PMMA-based primer for use over concrete and concrete repair materials:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Pro Primer T, by Siplast, or as recommended by roofing manufacturer, or a comparable product by one of the following as part of an approved system:
   a. Soprema Inc.
   b. Johns Manville.
   c. Or approved equal.

G. PMMA Primer for Asphaltic Substrates: A two-component, fast-curing, PMMA-based primer for use over asphaltic materials:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Pro Primer R, by Siplast, or as recommended by roofing manufacturer, or a comparable product by one of the following as part of an approved system:
   a. Soprema Inc.
   b. Johns Manville.
   c. Or approved equal.

H. PMMA Primer for All other Substrates: As recommended by the manufacturer.

I. Thixotropic Agent: A liquid additive used to increase the viscosity of the PMMA-based resin products, allowing the resins to be applied over vertical or sloped substrates:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Pro Thixo, by Siplast, in amount recommended by manufacturer for application , or a comparable product by one of the following as part of an approved system:
   a. Soprema Inc.
   b. Johns Manville.
   c. Or approved equal.

J. Termination Bar: 1/8 in. by 1 in., prepunched stainless steel bar.
1. Termination bars that are to receive a sealant bead are to have a bent leg to receive Sealant.

K. Ceramic Granules: No. 11 Grade Specification Ceramic granules of color scheme matching the granule surfacing of the finish ply.

L. Splash Blocks: Precast concrete with steel wire reinforcement, 3 in. x 12. in. x 24 in.

2.7 INSULATION AND COVER BOARD

A. Insulation: Rigid polyisocyanurate insulation boards with integrally laminated heavy, durable, and dimensionally stable coated polymer bonded inorganic all-glass fiber mat facer, square edge, maximum board thickness of 2 in. for flat and tapered installation, providing the total thickness shown on the Drawings.
1. Insulation must meet ASTM C1289, Type II, Class 2, Grade 3.
2. Minimum compressive strength, ASTM D1621, 25 psi.
3. Maximum water absorption by volume per ASTM C209, < 1.5%.
4. Insulation must have an LTTR value of 5.7°F sq ft h/Btu/in. of thickness in accordance with ASTM C1289.
5. Tapered insulation must have 1/8 in. per foot slope.
6. Use steep slope insulation edge strips around drains to create a drain sump.

B. Cover Board.
   1. 4 ft x 4 ft enhanced fiberglass mats front and back that are bonded to a high-density gypsum core recommended by the manufacturer; 1/2 in. thick; 900 psi compressive strength.
   2. 4 ft x 4 ft board manufactured from Portland cement, lightweight aggregate, or fill, and glass mesh reinforcement recommended by the manufacturer, 1/2 in. thick, 900 psi compressive strength.

C. Fasteners: Provide as required by manufacturer's requirements to meet the Code required wind uplift pressures.

D. Adhesive: A single component, moisture cured, polyurethane foam adhesive, dispensed from a portable, pre-pressurized container used to adhere insulation panels to the substrate as well as to other insulation panels.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Para-Stick Professional Roof Insulation Adhesive, by Siplast, or a comparable product by one of the following as part of an approved system:
      a. Soprema Inc.
      b. Johns Manville.
      c. Or approved equal.

E. Primer: As recommended by the manufacturer in writing.

F. Mechanical Fasteners: Manufacturer's recommended roofing fastener and metal plate for each roof structural deck type.
   1. Length as required to provide the manufacturer's recommended embedment depth in the roofing system substrate.

2.8 ACCESSORIES

A. Cant Strips: 5 in. face, 45°, wood fiber board cant strips, ASTM C208.

B. Termination Bar: 1/8 in. x 1 in., prepunched stainless steel bar conforming to ASTM A240/240M.

C. Separator Tape: Aluminum tape as recommended by the manufacturer.

D. Fasteners: Noncorrosive fasteners for applications involved as recommended by the manufacturer.

E. Solvent-Based Cleaner for Tools and Membrane Tie-Ins: Methyl Ethyl Ketone (MEK) or acetone, or as recommended by the manufacturer in writing.

F. Water-Based Cleaner for Membrane: As recommended by the manufacturer in writing.

G. Metal Hose Clamp (Draw Band): Stainless steel worm drive type.

H. Sealant for Concrete Crack Preparation and Joint Treatment: One-part, non-sag elastomeric polyurethane sealant, ASTM C920, Type S, Grade NS, Class 35. Provide primers recommended by Sealant manufacturer and approved to the roofing membrane manufacturer. Provide expanded, closed-cell polyethylene backer rod or bond breaker as required for proper Sealant-joint geometry and detailing.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Siplast PS-304 Elastomeric Sealant, by Siplast, or a comparable product by one of the following as part of an approved system:

a. Soprema Inc.
b. Johns Manville.
c. Or approved equal.

I. Primer: As recommended by roofing manufacturer in writing and based on results of field adhesion testing.

J. Other Sealants: Subject to compliance with requirements and Commissioner's approval.

K. Backer Rod: ASTM C1330, of type and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

L. Splash Blocks: Precast concrete with steel wire reinforcement, 3 in. x 12. in. x 24 in.

2.9 WOOD BLOCKING

A. Wood must be dry (maximum 19% moisture content for blocking and 15% for plywood) and free of warping, bowing, or twisting.

B. Pressure-Treated Lumber: Alkaline copper quaternary (ACQ) treatment to AWPA Standards T1 and U1 with minimal chemical retention on 0.25 lbs per cubic foot of wood for blocking and 0.40 lbs per cubic foot of wood for plywood.

C. Size: As required for the application.

D. Plywood: Provide minimum APA C-D exterior CDX plywood. Thickness: 3/4 in. or as shown on the Drawings.

E. Fasteners for Wood Blocking: 3/8 in. diameter stainless steel wedge-type expansion anchors. Tested per ACI 335.2 and ACI 193.

F. Length: Sufficient to obtain 1-7/8 in. minimum embedment in the concrete.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Also refer to requirements in Related Sections.

B. The Contractor is to examine substrate conditions and other conditions under which this Work is to be performed and notify the Commissioner, in writing, of circumstances detrimental to the proper completion of

the Work or that vary from that shown on the Drawings. Do not proceed with Work until unsatisfactory conditions are corrected to permit proper installation of the Work.

1. Examine joints indicated to receive joint Sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint Sealant performance.

C. Verify that surfaces and site conditions are ready to receive Contract Work. All substrates to receive the roofing membrane must be smooth, clean, and have no sharp edges, ridges, or points, and must be free of loose, spalled, or weak material.

D. Beginning Work indicates Contractor's acceptance of Project conditions.

3.3 DELIVERY, STORAGE, AND HANDLING

A. Store elastomeric materials, adhesives, solvents, and sealants in their original containers and maintain at a temperature between 60°F and 80°F.

B. Store solvent-bearing solutions, resins, additives, inhibitors, and adhesives in accordance with the SDS and/or New York City fire authority. After partial use of materials, replace lids promptly and tightly to prevent contamination.

C. Store rolled goods on ends only. Discard rolls which have been flattened, creased, or otherwise damaged. Place rolls on pallets on clean rigid floors stored out of exposure to sunlight or weather. Unroll felts and allow them to flatten out before application.

D. Handle all materials to avoid damage. Handle all materials so as to preclude damage and contamination with moisture or foreign matter. Keep away from open fire, flame, or any ignition source. Vapors may form explosive mixtures with air. Avoid skin and eye contact with this material. Avoid breathing fumes. Do not eat, drink, or smoke in the application area. Workers are to wear long sleeve shirts, long pants and Work boots. Workers are to wear butyl rubber or nitrile gloves when mixing or applying this product. Use safety glasses with side shields for eye protection. Use local exhaust ventilation to maintain worker exposure below TLV as listed on SDS for respective products. If the airborne concentration poses a health hazard, becomes irritating, or exceeds recommended limits, use a NIOSH-approved respirator in accordance with OSHA Respirator Protection requirements. The specific type of respirator will depend on the airborne concentration. A filtering face piece or dust mask is not acceptable for use with this product if TLV filtering levels have been exceeded.

E. Damaged Material: Any materials found to be damaged or stored in any manner other than stated above will be rejected, removed, and replaced at the Contractor's expense.

F. Do not dilute primers, solvents, cements, adhesives, coatings, or sealants. Keep containers closed except when removing materials from them. Do not allow petroleum extracts or oil in any form to contact the membrane materials or their components.

G. Comply with all other manufacturer's requirements for delivery, storage, and handling.

3.4 SUBSTRATE PREPARATION

A. The roof deck and roof construction must be structurally sound to provide support for the new roof system. The Contractor must load materials on the rooftop so as to eliminate risk of deck overload due to concentrated weight.

B. Applicator is to verify that the preparation Work meets the following conditions:
   1. Roof drains and scuppers have been conditioned and, placed, and installed properly.
   2. Roof curbs, nailers, equipment supports, vents, and other roof penetrations are properly secured and prepared to receive new roofing materials.
   3. All surfaces are smooth and free of dirt, debris, and incompatible materials.
   4. All roof surfaces are free of water, ice, frost, and snow.

C. Prepare all substrate surfaces scheduled to receive roofing and flashing in accordance with the roofing system manufacturer's recommendations and requirements and as provided in this Section, whichever is more stringent.

D. Continually remove all dust and debris from surfaces scheduled to receive any sheet membrane by sweeping and blowing with compressed air and/or vacuuming.

E. Concrete.
   1. Concrete must be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, bituminous products, and previous waterproofing materials.
   2. Substrate must be sound and all spalls, voids, and blow holes on vertical or horizontal surfaces must be repaired prior to placement of the primer coat. Ensure all uneven areas are leveled using cementitious or other suitable materials. Repair accordance with the requirements of the Commissioner and approved by the membrane manufacturer.
   3. Mark deficiencies in the concrete substrates that adversely affect roofing installation for correction by the Contractor. Notify the Commissioner in writing of the deficiencies. Cracks in concrete not considered a defect or detrimental to the structure is to be addressed during the waterproofing installation as directed in this Section.
   4. Extent and location of thin surface patching requires approval of the Commissioner and membrane manufacturer prior to the application of any system component.
   5. Repair all concrete as required by the roofing manufacturer prior to installing the roofing system.

F. Do not install Sealants to masonry substrates until all repairs to those substrates are completed to provide a smooth, even, continuous substrate and have had sufficient time to cure/release moisture.

G. Surface Cleaning of Joints: Clean out joints immediately before installing joint Sealants to comply with joint Sealant manufacturer's written instructions and the following requirements:
   1. Remove all foreign material from joint substrates that could interfere with adhesion of joint Sealant, including dust, paints (except for permanent, protective coatings tested and approved for Sealant adhesion and compatibility by Sealant manufacturer), old joint Sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost. Surface must be bare prior to primer application., except as noted herein.
      a. Sealants applied to painted wood substrates are to be applied to fully-cured paint finish.

H. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint Sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include, but are not limited to the following:
1. Concrete.
2. Masonry.

I. Remove laitance and form-release agents from concrete.

J. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint Sealants.

K. Joint Priming: Prime joint substrates where recommended by joint Sealant manufacturer or as indicated by pre-construction joint-Sealant-substrate tests or prior experience. Apply primer to comply with joint Sealant manufacturer's written instructions. Confine primers to areas of joint Sealant bond; do not allow spillage or migration onto adjoining surfaces.
1. Use only one coat of primer. Do not apply primer in a thick layer.
2. Apply primer to clean, dry substrates at ambient temperatures above 50°F.
3. Pour primer into a clean container for use and apply primer with a clean brush. Do not pour more than a 10 min. supply into container to prevent deterioration. Replace cap on primer immediately after use.
4. Remove from site any primer that is discolored, contains a precipitate, or has thickened.
5. Do not apply primer to Sealant backings. Remove and replace all Sealant backings exposed to primer.

L. Masking Tape: Use masking tape at all Sealant joints to prevent contact of Sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove Sealant smears and to create a clean Sealant joint edge. Remove tape immediately after tooling, without disturbing joint seal.

3.5 GENERAL WORKMANSHIP FOR ROOFING

A. Comply with the manufacturer's recommendations or these Specifications, whichever is more stringent.

B. Do not apply any roofing materials in presence of any water. Comply with applicable recommendations by manufacturers of all materials for workmanship and handling, except as modified in this Section.

C. Only perform as much roofing installation on any day in which the complete roofing system can be installed in that day. Use of the vapor barrier as temporary roofing is not allowed. If any water is allowed to enter under any part of the newly completed roofing, remove and replace the affected area and all materials exposed to water at the Contractor's expense. Perform moisture testing of the roof substrate as recommended by the manufacturer to show that it complies with manufacturer's requirements prior to re-roofing any such repaired areas.

D. Provide temporary cutoffs at the end of each day, between the roof and the roof deck, around all exposed edges, and any incomplete flashing areas. Such seals are to prevent moisture penetration into the building, under the existing roof system, or under the new membrane. Remove the cutoffs completely before proceeding with subsequent Work.

E. Do not allow wrappers and packaging materials to be included in the roofing system.

F. Components of roofing system may be toxic and flammable. Heed all manufacturer's cautions and warnings in regard to their use. Take proper precautions to avoid fire hazards and exposure of roofing personnel or building occupants to hazardous fumes.

G. Stir all liquid components before each use to thoroughly combine components as recommended by the manufacturer.

H. Apply liquids in a smooth, even coating without globs. Use pump cans to dispense cleaning fluids.

3.6 VAPOR RETARDER INSTALLATION

A. Install vapor barrier according to the manufacturer's published installation instructions and these Specifications, whichever is more stringent.

B. Provide smooth transitions and eliminate loose materials and sharp protrusions. Clean cover board surface with a broom and compressed air or vacuum. Remove dust and debris.
   1. Patch the substrate as required by the manufacturer using materials approved by the manufacturer for the application.

C. Primer Application: Substrate must be clean, dry, and free of dust, grease, or other contaminants. Apply primer in accordance with manufacturer's written instructions. Vapor barrier must be installed on the same day as the primer and adhesive application.
   1. Do not install when it is raining, snowing, or on wet/humid surfaces. Install primer at temperatures 40°F and above.

D. Install adhesive according to the manufacturer's recommendations and as required to comply with the Project's wind uplift resistance requirements.

E. Install vapor retarder over the primed roof deck, immediately rolling the membrane with rollers of the weight required by the manufacturer, in accordance with the manufacturer's installation instructions. Hand rollers are required for terminations on vertical surfaces. Take all necessary precautions to avoid punctures, tears, or fishmouths in the vapor retarder. Repair any damaged areas of the vapor retarder as recommended by the manufacturer.

F. Apply vapor retarder from low to high points, in a shingle fashion, so that laps shed water. Lap all edges of the vapor retarder 3 in. minimum and all ends 6 in. minimum. Stagger all end laps.

G. Apply manufacturer's recommended trowel-grade adhesive to seal around penetrations, T-joints, or step-offs. Use a hand roller or seam roller to mate the entire seam together. Do not apply trowel-grade adhesive where it may come in contact with incompatible materials.

3.7 INSTALLATION OF INSULATION AND COVER BOARD

A. Install insulation and cover board according to the manufacturer's published installation instructions and these Specifications, whichever is more stringent.

B. Install all insulation to achieve secure attachment to the deck. Do not use pieces of insulation smaller than 18 in. in length or width. Provide insulation and cover board layers in a staggered row pattern; minimum 6 in. stagger between layers and between new insulation and existing insulation; shove boards tightly together.

C. Arrange insulation board staggers at the end of each day's Work to provide continuity of staggered joints between adjacent Work areas.

D. Insulation and cover board must be neatly but loosely fit together, with no gaps larger than 1/8 in. Fill any gaps larger than 1/8 in. as recommended by the manufacturer.

E. Provide crickets behind all obstructions to flow toward drains.

F. At roof drains, install tapered edge strips around the drains set in adhesive to create a sump around the drains. Adhere roofing cover board to extend to drain.

G. Adhered Insulation and Cover Board.
   1. Apply adhesive with a pace cart at spacing required to meet the Project's wind uplift resistance requirements. Additional adhesive may be required for rougher surfaces.
   2. Application Rates: Apply adhesive ribbons as recommended by the manufacturer and as required to resist the Project's wind uplift resistance.
   3. Place insulation board into the adhesive shortly after it has reached its maximum rise and walk into place.
   4. Do not install insulation or cover board in adhesive that has started to "skin over" or set. Remove and replace any adhesive that shows these conditions.
      a. Do not allow adhesive ribbons to extend past the insulation or cover board edges. Remove any adhesive showing this condition.
      b. Do not apply adhesive if surface and/or ambient temperatures are below 45°F during application or subsequent curing time.
      c. Minimum product temperature before entering the dispenser should be 72°F.
      d. Adhesive must not be used during inclement weather. Adhesive must not be applied to wet or damp surfaces.
      e. Repeat for subsequent layers of insulation and cover board once layer below is fully adhered.

H. Mechanically-fastened Insulation and Cover Board.
   1. Install fasteners and plates per the manufacturer's instructions.
   2. Install fasteners at the spacing and embedment depth in the substrate required to meet the Project's wind uplift requirements.
   3. Each fastener to have a metal plate.

3.8 MODIFIED BITUMEN ROOFING AND FLASHING INSTALLATION

A. Modified bitumen roof and flashing membrane construction must be in accordance with the manufacturer's published installation instructions and these Specifications, whichever is more stringent.

B. Apply all plies perpendicular to the slope of the deck, beginning at the low points of the deck and shingling plies in the direction of slope so that no laps "buck" water runoff. Lap all sheets a minimum of 3 in. along edges and 3 in. minimum on ends. Do not allow laps between plies to occur directly over cover board joints.

Offset end laps of adjacent rolls in the same ply a minimum of 3 ft. Stagger all end laps between plies at least 12 in.

C. Provide the base ply on the cover board in a continuous layer of cold adhesive. Roll the sheet into the adhesive to ensure full contact and embedment of the sheet. Adhesive should be expressed at all side and end laps.

D. Provide flashing underlayment sheets prior to roofing cap sheet as shown on the Drawings.

E. Provide the cap sheet in a continuous layer of cold adhesive. Roll the sheet into the fresh adhesive to ensure full contact of the sheet with the adhesive. Adhesive should be expressed at all side and end laps. Stagger side laps of the top ply a minimum 12 in. from side laps in the underlying base ply.

F. Extend both plies to the top edge of cants and fully over horizontal wood blocking at roof edges as shown on the Drawings. Extend adhesive as specified to the edge and ends of all sheets.

G. Provide cap sheet flashing.

H. Ensure full and continuous seal and contact between bottom ply and the cover board and between the plies. Remove and replace all sheets that are not fully and continuously bonded. Lay all plies without wrinkles, creases, or fishmouths. Cut out fishmouths, side laps, or any areas not completely sealed, and patch. Patches must be a full roll width and extend at least 6 in. on each side of the defect.

I. Apply mineral granules (from the manufacturer of the cap sheet) into all adhesive overruns at side and end laps on the cap sheet surface, while the adhesive is still uncured, to achieve a uniform surface appearance. Press the granules into the adhesive.

3.9 COLD FLUID-APPLIED REINFORCED FLASHING INSTALLATION

A. Install cold fluid-applied reinforced flashing according to the manufacturer's published installation instructions and these Specifications, whichever is more stringent.

B. Surfaces to be prepared as a substrate for the new roofing system as follows:
   1. Prepare flashing substrates as required for application of new roofing membrane flashings.
   2. Inspect substrates, and correct defects before application of new roofing. Fill all surface voids greater than 1/8 in. wide with an acceptable fill material.
   3. Remove all ponded water, snow, frost, and/or ice from the Work substrate prior to installing new roofing materials.
   4. The final substrate for roofing must be clean, dry, free of loose, spalled, or weak material including coatings, mineral aggregate, and flood coat/gravel surfacing, oil, grease, contaminants, abrupt changes in level, roofing agents, curing compounds, and free of projections which could damage membrane materials.
   5. Taping: Utilize masking tape at perimeters and joints of the area to be roofed to provide neat terminations.

C. Concrete and Masonry Surface Preparation.

1. New or existing concrete must be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, bituminous products, previous waterproofing materials, and any other material that may affect the new roofing system's bond to the concrete substrate.
2. New or existing concrete must be dry with a maximum moisture content of 6% and a maximum internal relative humidity of 75%. Determinations of moisture content is to be performed by the Installer.
3. Preparation of Existing and Newly Placed Concrete/Masonry Substrates to Receive Resin Materials: Following evaluation for moisture content and confirmation that the moisture content is at an acceptable level, shot-blast or scarify/shot blast the surface to provide a sound substrate free from laitance and to generate a concrete surface profile of CSP-2 to CSP-4 as defined by the ICRI. For existing concrete and masonry substrates, verify that the substrate is free from additional contaminants, including bitumen, coal tar, primer, coatings, adhesives, sealer or any material that may inhibit adhesion of the specified primer. Grinding may be used as a preparation method for localized areas that cannot be reached by shot-blasting equipment provided that a surface profile of CSP-2 to CSP 4 can be generated. When using mechanical methods to remove existing waterproofing products or surface deterioration, the surface profile is not to exceed 1/4 in. (peak to valley).
4. The substrate must be sound and all spalls, voids, and blowholes on vertical or horizontal surfaces must be repaired prior to placement of the primer coat. Ensure all uneven areas are leveled using specified materials. Repairs are to be done in accordance with the requirements of the Commissioner and approved by the membrane manufacturer.
5. Areas of minor surface deterioration of 1/4 in. or greater in depth must be repaired to prevent possible ponding of the system, leading to excessive usage of primer and resin.
6. Extent and location of thin surface patching must require approval of the Commissioner and membrane manufacturer prior to the application of any system component.
7. For concrete materials with a compressive strength of less than 3,500 psi, contact roofing manufacturer's technical department for substrate preparation requirements.
8. Grind all precast concrete to receive roofing membrane smooth and install skim coat of resin paste to achieve smooth surface.

D. Metal Surface Preparation
1. Clean and prepare metal surfaces to near white metal in accordance with SSPC SSP3 (power-tool clean) or as required by membrane manufacturer. Extend preparation a minimum of 1/2 in. beyond the termination of the membrane flashing materials. Notch steel surfaces to provide a rust-stop.
2. In addition to cleaning, all metal surfaces must be abraded to provide a rough open surface. A wire-brush finish is not acceptable.
3. Do not install roofing over coatings on sheet metal.

E. Finish Leveling, Patching, and Crack Preparation for Fluid-Applied Membrane Application.
1. General: Resin/sand mix is the preferred material for all substrate finish leveling, crack and wall/deck preparation, and patching. Resins and patching mix provides a fast-set time of approximately 45 min. and does not require surface grinding.
2. Primer/sand mix is an alternative substrate leveling and patching material over horizontal surfaces. Primer/sand patching mix provides a set time of approximately 1 hr and does not require surface grinding. Primer/sand mix is typically applied in conjunction with general surface priming.
3. Substrate Leveling and Patching: Substrate conditions are to be evaluated by the Contractor, Commissioner, and membrane manufacturer. Perform leveling and patching operations as follows:
    a. Fill cavities on horizontal and low-slope surfaces with a patching mixture of PMMA primer and approved kiln-dried sand in a 1:3 primer-to-sand ratio by volume or with PMMA patching paste using trowels to apply the resin mortar in place and achieve flat surface.

b. Fill cavities on sloped and vertical surfaces with PMMA patching paste using trowels to apply the resin mortar in place and achieve flat surface.
c. Silica sand must be kept absolutely dry during storage and handling.
d. Any surface to be leveled or filled must first be primed with an appropriate PMMA primer, and materials must be placed in lifts no greater than the maximum thickness indicated by the membrane manufacturer.

F. Joint and Crack Preparation: Joints, cracks, and fractures in the structural deck/substrate must be prepared as defined below prior to installation of the waterproofing membrane.
1. Nonmoving Cracks: Determine that crack is nonmoving. Clean out crack by brushing and oil-free compressed air. Fill crack with paste resin. Allow for a minimum of 1 hr cure or as required by manufacturer.
2. Moving Cracks: Determine that crack is moving. Clean out crack by brushing and oil-free compressed air. Fill crack with paste resin. Allow for a minimum of 1 hr cure or as required by membrane manufacturer. Apply resin and 4 in. wide strip of membrane (resin and fleece) in strict accordance with membrane manufacturer's written instructions.

G. Primer Preparation.
1. The substrate surface must be dry, with any remaining dust or loose particles removed using clean, dry, oil-free compressed air, industrial vacuum, cloth wipe or a combination of methods.
2. Do not install primer on any substrate containing newly applied and/or active asphalt, coal-tar pitch, creosote, or penta-based materials unless approved in writing by membrane manufacturer. Some substrates may require additional preparation before applying primer. Confirm suitability of substrate preparation with the manufacturer prior to installing primer.
3. Mix and apply two-component PMMA primer in strict accordance with written instructions of membrane manufacturer. Use only proprietary materials, as supplied by the membrane manufacturer.
4. Using the appropriate primer, apply to substrates that will receive the roofing membrane or flashing. Apply the primer using a roller at the minimum rate specified by the primer manufacturer and allow to cure for a minimum of 45 min., or as recommended by the manufacturer for the substrate and Project conditions. Increase application rates over absorbent substrates as recommended by the manufacturer.

H. Mixing of Standard Two-Component PMMA Primers.
1. Mix primer in strict accordance with the manufacturer's published instructions and recommendations for the substrates and Project conditions.
2. Do not thin primer. Determine required primer coverage for each substrate material/condition and apply in strict accordance with written instructions of membrane manufacturer.
3. Mix only that amount of primer that can be used within the pot life published by the manufacturer.

I. Application of Primers.
1. Apply PMMA primer at the minimum rate recommended by the manufacturer. Obtain written recommendation from the manufacturer of primer application rate for substrates and Project conditions.
2. Roll or brush the primer evenly onto the surface to fully saturate the substrate in one application. Do not allow primer to pond or collect in low areas. Do not overapply primers as this may interfere with proper primer catalyzation.
3. Apply primer only up to the edge of the membrane flashing terminations. Primer application past the membrane terminations requires surfacing with an approved material.
4. For PMMA primer applications over cementitious substrates where protection from substrate wetness is required, apply primer coat at a heavier application rate until pore saturation is achieved.

5. Allow PMMA primers to cure for a minimum of 45 min. before membrane application, or as recommended by the manufacturer. Membrane must be applied to primer only when completely dry and without tack.
6. Do not apply new primer over exposed primer older than six months, primer prematurely exposed to moisture, or primer used as temporary waterproofing, unless approved in writing by the membrane manufacturer. If the surface of the primer becomes dirty or contaminated from long-term exposure to the elements, thoroughly clean the primer with specified cleaner. Obtain confirmation from the manufacturer if it is suitable to install the roofing membrane over the existing primer or if reapplication of primer is required.

J. Flashing Application.
1. Install cold fluid-applied reinforced PMMA waterproofing flashing system in accordance with the recommendations of the membrane manufacturer and as depicted on the Contract Documents. Provide system with base flashing, edge flashing, penetration flashing, counterflashing, and all other flashings required for a complete watertight system.
2. All membrane flashings are to be installed concurrently with the waterproofing membrane as the Project progresses. Temporary flashings are not allowed without prior written approval from the manufacturer. If any water penetrates the new waterproofing membrane because of incomplete flashings, the affected area is to be removed and replaced at the Contractor's expense.
3. Provide a minimum vertical height of 8 in. or as depicted in the Contract Documents and as recommended by the manufacturer. Flashing height must be at least as high as the potential water level that could be reached as a result of a deluging rain and/or poor slope. Do not flash over existing weep holes.
4. All flashings are to be terminated as required by Contract Documents and the membrane manufacturer. Install a fillet bead of resin across the top of all vertical flashing terminations.

K. Mixing of Resin.
1. Mix resin and catalyst as per the manufacturer's published instructions recommended by manufacturer for substrate type and Project conditions. Use the proportions of catalyst-to-resin recommended by the manufacturer for substrate type and project conditions.
2. At steep slope and vertical conditions, add thickening additive to resin mix as per the manufacturer's published instructions and as recommended by the manufacturer for substrate type and project conditions.

L. Application of Resin/Fleece.
1. Apply mixed resin to the prepared surface at the rate recommended by the manufacturer. The resin should be rolled or brushed liberally and evenly onto the surface using a broad, even stroke. Cover one working area at a time, between 2 to 5 sq ft.
2. Roll out dry polyester fleece onto the liquid resin mix, making sure the smooth side is facing up (natural unrolling procedure), avoiding any folds and wrinkles. The fleece will begin to rapidly saturate with the liquid resin mix. Use a medium nap roller or brush to Work the resin into the fleece, saturating from the bottom up, ensuring that all angle changes points are tight and not bridged and eliminating air bubbles, wrinkles, etc. The appearance of the saturated fleece should be light opaque amber with no white spots. White spots are indications of unsaturated fleece or lack of adhesion. Correct these faults before the resin cures.
3. Apply additional liquid resin mix on top of fleece at the rate recommended by the manufacturer to finish the saturation of the fleece. Roll this final coating into the fleece, which will result in a glossy appearance. The fleece can only hold so much resin and all excess should be rolled forward to the

unsaturated fleece, eliminating ponding or excessive buildup of the resin. Any excess resin left on the top of the fleece will weather and peel off. The correct amount of resin will leave no whiteness in fleece and there will be a slightly fibrous surface texture. The final resin coating should be smooth and uniform.

a. Prevent contact between mixed/unmixed resin and new/existing membrane, except as noted on the Drawings. If any unmixed resin contacts membrane surface, remove immediately and clean thoroughly with a cloth rag.
b. At all fleece seams, allow a 2 in. overlap for all side joints and a 4 in. overlap for all inside and outside corner overlaps.
c. At membrane tie-offs, clean in-place membrane with specified cleaner once resin has cured. Allow cleaner to fully evaporate before application of new resin.
d. Apply a fillet bead of resin across the top of all vertical flashing terminations.

M. Metal Flashing – General.
1. See Related Sections for sheet metal flashing installation requirements.
2. Metal flashing flanges to which membrane is to be bonded must be a minimum of 4 in. in width and secured to the substrate 6 in. o.c. staggered with fasteners appropriate to the substrate type. The flanges are to be provided with a roughened surface that has been cleaned of all oil, coatings, residue, and any other material that could affect the roofing's bond.
3. Metal edges that will be overlaid with membrane are to be provided with a 1/2 in. minimum hemmed edge.
4. Apply primer, resin, and fleece to metal flange, extending membrane to outside face of metal edging, and to vertical face of metal base/curb flashing.

N. Penetration Flashing – General.
1. Flash all penetrations using cold fluid-applied reinforced PMMA waterproofing membrane in accordance with the Contract Documents, manufacturer's installation instructions, and manufacturer's recommendations for the substrates and Project conditions. Use flashing resin with fleece reinforcement.
2. Flashing is typically constructed as a two-part assembly consisting of a vertical wrap and a horizontal target patch. There must be a minimum of a 2 in. overlap between vertical and horizontal flashing components.

O. Drain Flashing – General.
1. Do not flash drains until any grout or other setting material around the drains is cured and dry as recommended by the membrane manufacturer.
2. Do not allow roofing materials, packaging, or other debris to block or clog drains during or after the application of roofing materials.
3. Clean and roughen all drain surfaces to receive roofing membrane using a grinder to provide a suitable substrate. Remove any debris from grinding.
4. Prime all drain flanges and substrates with the specified primer.
5. Flash the drains using the specified cold fluid-applied reinforced flashing membrane. Extend the flashing membrane over the primed drain flange a minimum of 4 in. into the primed drain bowl surface and extend a minimum of 6 in. around the drain flange. Apply a bead of the specified resin at all membrane edges.
6. Overlap the flashing membrane with the primary roofing membrane a minimum of 6 in. Apply a continuous bead of the specified resin at the membrane edges on top of the flashing membrane.

7. Apply a clamping ring exerting sufficient pressure to affect a seal between the clamping ring and the cured membrane.

P. Walls, Curbs, and Base Flashings – General.
1. Wall, curb, and base flashings are to be installed to solid substrate surfaces only. Adhering to gypsum-based panels, cementitious stucco, synthetic stucco, wood or metal siding, and other similar materials are not acceptable.
2. All flashings installed at transitions between horizontal and vertical planes must include a continuous rigid cant at the transition.
3. Flash walls, curbs, and base flashings using cold fluid-applied reinforced PMMA waterproofing membrane where shown on the Drawings.
4. Reinforce all transition locations and other potential wear areas with a 4-in. wide polyester fleece bottom layer evenly positioned over the transition prior to installing the exposed flashing layer.
5. Remove the foil facing from aluminum-faced modified bitumen flashing prior to lapping the PMMA membrane over it where required on the Drawings.
6. Extend flashing a minimum of 4 in. onto the field substrate surface.

3.10 SEALANT INSTALLATION

A. Comply with all manufacturer's recommendations and requirements and as provided in this Section, whichever is more stringent.

B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint Sealants as applicable to materials, applications, and conditions indicated.

C. Install Sealant backings of kind indicated to support Sealants during application and prevent three-sided adhesion, and at position required to produce cross-sectional shapes and depths of installed Sealants relative to joint widths that allow optimum Sealant movement capability.
1. Do not leave gaps between ends of Sealant backings.
2. Do not stretch, twist, puncture, or tear Sealant backings.
3. Do not cut Sealant backings lengthwise.
4. Install one unit of backer rod sized according to the Project Specifications at each Sealant joint. Change backer rod sizes as frequently as required by the variation in the joint width. Do not twist rods together, fold over, or stack backer rods to fit small rods into a wider opening. Provide a full range of rod sizes at the site of all Sealant Work.
5. Remove absorbent Sealant backings that have become wet before Sealant application and replace with dry materials.
6. Do not touch with fingers or otherwise contaminate the substrate surfaces while inserting the Sealant backings.
7. Do not rupture the skin of the backer rod during installation. Remove any backer rod containing punctures and solvent-clean the surfaces again.
8. Replace any backer rod not sealed over by end of each day and solvent-clean and prime surfaces again.

D. Install bond-breaker tape to prevent three-sided adhesion behind Sealants where Sealant backings are not used between Sealants and backs of joints.

E. Install Sealants using proven techniques complying with the following and at the same time backings are installed:
   1. Place Sealants so they directly contact and fully wet joint substrates. When installing Sealant, push Sealant ahead of caulking gun nozzle. Do not drag nozzle across joint when installing Sealant.
   2. Completely fill recesses in each joint configuration.
      a. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum Sealant movement capability.
      b. For weather Sealants, construct Sealant with a width-to-depth ratio of 2:1, with maximum thickness of 1/2 in. and minimum thickness of 1/4 in.
      c. At fillet (triangular) joints, extend Sealant at least 3/8 in. onto the surface beyond and parallel to the bond breaker (tape or backer rod) and 5/8 in. onto the surface perpendicular to the bond breaker, unless otherwise detailed or required by the manufacturer.
      d. At dual-stage joints, provide a 1/2 in. deep drainage cavity between the exterior face of the secondary joint and the back-up material of the primary joint.
      e. Keep sealants a minimum of 1/2 in. from asphalt-based membranes unless otherwise noted.
      f. Inspect each cartridge or container of Sealant before use and verify that the production date is within six months of the date of application. Remove all Sealant more than six months old from the site.
      g. Mask exposed surfaces along joint before applying Sealant.
      h. Recheck correct backer rod and bond breaker tape positioning before applying Sealant.
      i. Seal joints within 10 hrs of primer application, or as recommended by the manufacturer if shorter duration.
      j. Within 5 min. of Sealant application and before skin develops on Sealant, dry tool the joint surface with a concave tool to ensure intimate contact with substrate and to eliminate air bubbles. Do not use any liquid for tooling. Provide a smooth, uniform, finished surface.
      k. Remove masking tape within 10 min. of tooling liquid Sealant. Avoid contaminating adjacent surfaces with excess Sealant. Remove all traces of smears and droppings on metal or glass surfaces promptly, using a solvent recommended by the Sealant manufacturer and that will not damage or discolor the building surfaces. Remove smears and droppings on porous surfaces by mechanical means after the initial cure of the Sealant.
      l. Coordinate Work to prevent contamination of fresh Sealant by dust or other debris.
      m. Tooling of Non-Sag Sealants: Immediately after Sealant application and before skinning or curing begins, tool Sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of Sealant with sides of joint.
         1) Remove excess Sealant from surfaces adjacent to joints.
         2) Do not use liquid of any kind when tooling sealant.
         3) Provide concave joint profile per Fig. 8A in ASTM C1193, unless otherwise indicated.
         4) Provide flush joint profile where indicated per Fig. 8B in ASTM C1193.
         5) Provide recessed joint configuration of recess depth and at locations indicated per Fig. 8C in ASTM C1193.

3.11 FIELD QUALITY CONTROL

A. Inform the Commissioner in writing on a daily basis of any of the following events. State-specific locations of each occurrence.
   1. Damage by other trades.

2. Debonded areas of membrane.
3. Leakage through the finished roofing membrane.

B. Provide site access to the authorized representative(s) including inspectors, Commissioner, and manufacturers' for inspection of the roofing membrane.

C. Field-Adhesion Testing: Field test joint Sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured Sealant joints as follows:
   a. Perform five (5) tests for the first 500 ft of joint length for each kind of Sealant and joint substrate.
2. Test Method: Test joint Sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in ASTM C1193, Tail Procedure, in ASTM C1521.
   a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
   b. Inspect tested joints and report on the following:
      1) Whether Sealant-filled joint cavities and are free of voids.
      2) Whether Sealant dimensions and configurations comply with specified requirements.
      3) Whether Sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion passes Sealant manufacturer's field-adhesion hand-pull test criteria.
3. Record test results in a field-adhesion-test log. Include dates when Sealants were installed, names of persons who installed Sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, Sealant fill, Sealant configuration, and Sealant dimensions.
4. Sealants pulled from test area by applying new Sealants following same procedures used originally to seal joints. Ensure that original Sealant surfaces are clean and that new Sealant contacts original Sealant.

D. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing below the manufacturer's published elongation or noncompliance with other indicated requirements will be considered satisfactory. Remove Sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove Sealants comply with indicated requirements. For every failure, perform two additional tests.
1. For all failed tests, review the sealant joint and substrate conditions with a manufacturer's representative on site and submit the manufacturer's field report with written recommendations for corrective action to the sealant installation.

3.12 CLEANING AND PROTECTION

A. Coordinate with other trades to avoid traffic over completed Work areas. Arrange Work sequence to avoid use of newly constructed roofing and flashing for storage, walking, staging, and equipment movement. Move equipment and ground storage areas as Work progresses to avoid abuse of roofing, as permitted by the Commissioner, or install rigid protection board materials (5/8 in. plywood, insulation boards, or similar) in between stored/staged items and the installed roofing. Notify the Commissioner immediately and in writing if anyone abuses or damages roofing or flashing components, and make necessary repairs without cost to the City of New York.

B. Against Loads: Protect Work of this Section against concentrated loads and any other loads or equipment that would damage the materials or Work.

C. Against Traffic: Do not permit traffic on horizontally installed Work of this Section, except for workmen doing the Work, during and after the installation.

D. Take and maintain necessary preventative measures to protect Work of this Section from damage until Project is accepted.

E. Upon completion of roofing and flashings (including all associated Contract Work), institute appropriate procedures for surveillance and protection of roofing during remainder of construction period. Protect all areas where membrane has been installed.

F. Promptly remove primer or membrane system from adjacent surfaces and leave Work area in broom clean condition.

G. Promptly remove from the site all materials or incomplete roofing exposed to moisture and/or any Work rejected by the Commissioner.

H. Dispose of all mixed cured resin in a safe and legal manner off site. Uncured resin is a hazardous material; do not throw away. Handle in accordance with applicable regulations.

I. Workmen and all others that walk on the membrane must wear clean soft-soled shoes so as not to damage materials. Equipment is to have no sharp edges and must be clean and free of any materials that are harmful to the roofing materials.

J. Clean off excess Sealant or Sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by:
   1. Joint Sealant manufacturers.
   2. Manufacturers' of products adjacent to joints.

K. Protect joint Sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so Sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint Sealants immediately so installations with repaired areas are indistinguishable from original Work.

END OF SECTION 07 52 00

SECTION 07 62 00 – SHEET METAL FLASHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following Documents apply to all required Work for the Project: (1) the Contract Drawings, (2) 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. Performance Requirements.
2. Submittal Procedures.
3. Project Conditions.
4. Quality Assurance.
5. Warranty.
6. Products and Accessories.
7. Execution.
8. Field Quality Control.
9. Cleaning and Protection.

B. Related Sections
1. Section 04 21 29 – Terra Cotta Masonry.
2. This Section incorporates the use of Sealants. Requirements specified in this Section are in addition to those in Section 07 52 00 – Modified Bituminous Membrane Roofing.

C. Summary of Work
1. This Section includes the Sheet Metal Flashing (Metal Flashing) components for the associated building enclosure systems, as shown in the Contract Documents. For additional requirements, refer to the Related Sections and the Drawings.
2. For all systems described, supply and install the following components and their subcomponents of the Work required to provide a complete system, including but not limited to the following:
    a. Install new Metal Flashings, including the following components, which comprise the Waterproofing System:
        1) Sheet Metal Flashings at horizontal surfaces, transitions, and all locations shown on the Drawings. Provide cleats, hook strips, skirt flashings, and associated accessories as shown on the Drawings.
        2) Membrane flashing, sealants, and separators, as shown on the Drawings to construct Sheet Metal Flashing expansion joints.
        3) Sealants, liquid membrane, and accessories at all penetrations, walls, wall openings, flashing terminations, and other locations as shown on the Drawings.

1.3 DEFINITIONS

A. The Work described in this and the Related Sections is referred to in this Section as the "Waterproofing System," "Sheet Metal Flashings," or "Metal Flashings."

1.4 PERFORMANCE REQUIREMENTS

A. Reference Standards and Regulations
   1. The Contractor's design, materials, and workmanship are to comply with the current codes listed below. Comply with and obtain all necessary approvals from the New York City Department of Buildings. Where their recommendations or requirements are to a lower standard than required by this Contract Document, this Document is to take precedence. Local codes include the following with the most recent amendments and their references, and are referred to as "Code" in this Section:
      a. 2022 New York City Building Code – General Administrative Provisions.
   2. Comply with applicable provisions and recommendations of the standards listed below. Where standards conflict or conflict with the provisions of these Specifications, the more stringent are to apply. Unless otherwise noted, the latest editions of the standards are to apply:
      a. American Iron and Steel Institute (AISI)
         1) AISI Cold-Formed Steel Design Manual.
      b. ASTM International (ASTM)
         1) ASTM A240/A240M – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
         2) ASTM B32 – Standard Specification for Solder Metal.
         3) ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
         4) ASTM B370 – Standard Specification for Copper Sheet and Strip for Building Construction.
         5) ASTM C1513 – Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
         6) ASTM D4637 – Standard Specification for EPDM Sheet Used in Singly-Ply Roof Membrane.
         7) ASTM E488 – Standard Test Methods for Strength of Anchors in Concrete Elements.
         8) ASTM E754 – Standard Test Method for Pullout Resistance of Ties and Anchors Embedded in Masonry Mortar Joints.
      c. National Roofing Contractors Association (NRCA)
         1) NRCA Roofing and Waterproofing Manual.
      d. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
         1) SMACNA Architectural Sheet Metal Manual.
      e. Single Ply Roofing Industry (SPRI)
         1) ANSI/SPRI ES-1 – Wind Design Standard for Edge Systems Used with Low Slope Roof Systems.
      f. Society for Protective Coatings (SSPC)
         1) SSPC-SP3 – Power Tool Cleaning.
      g. Revere Copper Products, Inc.
         1) "Copper and Common Sense."

B. General Prescriptive Requirements
   1. Provide Metal Flashings where indicated.
   2. Site-applied Sealant is not acceptable as part of the primary Waterproofing System unless shown on the Architectural Drawings or noted within this Section.
   3. All horizontal flashings, or any surface intended to drain moisture, must be sloped to the exterior 1/4 in. per foot minimum.

C. General Performance
   1. Install Metal Flashings according to the intended use appropriate standards, as specified herein, and per the manufacturer's recommendations.
   2. A qualified Contractor is to install the specified Metal Flashing System. The system must:
      a. Include suitable allowances for the specified construction tolerances.
      b. Withstand the specified deleterious and degrading effects of radiation from the sun, weathering, atmospheric pollution, vermin, fungi, and other growths for the required service life without maintenance in excess of routine cleaning and minor repairs.
      c. Be compatible with all materials with which it comes in contact.
      d. Not stain adjacent surfaces.

D. Durability Performance
   1. Horizontal Metal Flashing surfaces must be sloped to drain water and prevent water accumulation.
   2. Metal Flashings must be separated from dissimilar metals to prevent galvanic reaction, corrosion, and/or staining.
   3. Metal Flashings are to be free of excessive scratching, staining, or other aesthetic issues.
      a. "Oil-canning" of exposed sheet metal surfaces is not acceptable.
   4. Failure includes inability of Metal Flashings to meet the performance requirements set forth in this and all Referenced Systems, in addition to the following:
      a. Ingress of water into the interior building environment through any Metal Flashing components.
      b. Cracking or separation of soldered Flashing connections.
      c. Corrosion and staining.
   5. Structural Performance
      a. Metal Flashings shall resist the maximum design loads relevant to the associated system.
      b. Securely attach all Metal Flashings to the structure without noticeable deformation.
      c. Metal Flashings shall accommodate the structural, thermal, and moisture movements developed by the associated system and their Related Sections.
         1) Provide expansion joints in Metal Flashings to allow thermal expansion without compromising water infiltration resistance performance, as specified herein and where shown on the Drawings.
   6. Fire Performance
      a. Metal Flashings must:
         1) Have a resistance to combustion and fire spread appropriate to each part and assembly.
            a) Ensure assembly compliance with NFPA requirements and other applicable provisions.
         2) Not give off toxic fumes.
   7. Weatherproofing Performance
      a. Waterproofing System, including Metal Flashings and all associated materials, is to perform as a liquid-water drainage plane that will discharge condensation or incident rainwater to the exterior. Assemblies are to accommodate substrate movement and maintain continuity at 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.

8. Volatile Organic Content (VOC) Performance
   a. Provide low-VOC products where required by the City of New York to reduce odor and as required to comply with the VOC content limits of the State of New York Codes, Rules and Regulations.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.6 SUBMITTALS

A. Action Submittals
   1. Shop Drawings
      a. Shop Drawings are to be wholly developed by the Contractor in CAD and to scale showing the complete Work. Do not submit copies of the architectural Drawing details, manufacturer's standard details, or details from industry standards as Shop Drawings.
      b. Cleary identify all components, materials, and products on the Shop Drawings. Show adjacent conditions and materials for coordination, even if those elements are not part of the scope of this Section.
      c. All Shop Drawing details are to be fully dimensioned.
      d. Show all installation, anchorage, hook strips, cleats, etc., including placement and spacing.
      e. Submit Drawings showing the layout and elevation of all Metal Flashing components.
      f. Shop Drawings shall show the Contractor's intended installation of all typical and atypical conditions on the Project.
      g. Submit all details required by the Commissioner, including isometric details.
   2. Product Data
      a. Manufacturer's technical and installation literature for all materials specified or proposed in this and Related Sections for use on the Project. Properly label and reference to the appropriate Related Section.
      b. For each type of product indicated, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
      c. Provide documentation from the different material and system manufacturers showing that all materials are compatible with all other materials with which they come into contact at the Project, or recommendations to provide separation between non-compatible materials.
      d. Provide test reports showing that the materials and systems meet the performance criteria established by these Specifications.
   3. Samples
      a. Provide minimum 12 in. long Samples of all Metal Flashings, showing the exact profiles used for the Project.
         1) Include one prefabricated section used beneath fenestration products, which includes an upturned end dam, soldered joint, and expansion joint.
         2) Include one lock-seamed and soldered and one riveted and soldered transverse joint in through-wall flashing cut in half so that the interior of the solder joint is visible.

3) Include one lock seamed and soldered and one riveted and soldered coping sheet metal cap transverse joint cut in half so that the interior of the solder joint is visible.
4) All other Samples are to be 6 in. long or as specified.

4. Quality Control Plan
   a. Provide as required and specified in Related Sections.
   b. Work Sequence Plan: Provide a comprehensive Work sequence plan showing areas where Work will be performed by trades involved in each area and time required to complete each area. Do not commence Work until receiving Commissioner's written approval of the Work plan. Indicate water testing of exterior cladding or components (see Related Sections) in the sequence plan. The plan must include the following as a minimum:
      1) Notify the Commissioner in writing at least 72 hrs prior to the initial installation of the waterproofing membrane and Sheet Metal Flashings.
      2) Inspect conditions and materials to ensure conformity to the Contract requirements.
      3) Inspect substrate conditions and coordinate with Main / General Contractor to ensure proper substrate preparation in conformance to the manufacturer's requirements and Contract requirements.
      4) Inspect Work in progress to ensure that the Work is in compliance with approved procedures.
      5) Inspect all completed and any corrected Work for compliance with the Contract Documents and the membrane manufacturer's recommendations.

B. Information Submittals
   1. Product Test Reports
      a. Indicating compliance with performance requirements as required and specified in Related Sections.
   2. Quality Control Reports
      a. Field reports by Contractor and/or other third-party inspectors.
      b. Protection Plan: Written procedures and plans for providing temporary protection of areas that will be exposed to weather, traffic, etc., prior to the installation of the complete Waterproofing System.
   3. Installer Qualifications: An entity meeting the requirements of DDC General Conditions Section 14000 1.7/C/1.
   4. Maintenance Data: For Metal Flashings to include in maintenance manuals.
   5. Mockups: Provide mockups of all typical and atypical details. Mockups may be installed as part of a complete assembly for the Referenced System; allow Commissioner and/or other parties to review installation of the underlying waterproofing components prior to covering with the proposed cladding or other building enclosure components.

C. Closeout Submittals
   1. Warranties.
   2. As-built Drawings.

1.7 PROJECT CONDITIONS

A. Ensure that substrate materials are dry and free of contaminants. Do not commence with application unless substrate conditions are suitable. Contractor is to demonstrate that substrate conditions are suitable for the application of the materials.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Field Review Services: The Commissioner may review at the following points of the Project the installation of the Metal Flashing System:
   1. Project start review at the beginning of each phase of the Project to review special detailing conditions and substrate preparation.
   2. Periodic in-progress reviews throughout the Project to evaluate Metal Flashing application.
   3. Final punch-list review at the completion of each phase of the Project prior to installation of surfacing or overburden materials.
   4. Warranty inspection confirming completion of all punch-list items, surfacing, and cladding application.
   5. The manufacturer's field representative is to provide the Contractor, Commissioner, and the City of New York with written reports outlining observations and required corrections from each site visit.

C. Obtain materials through one source from a single manufacturer for the Metal Flashings to provide consistency in materials, unless otherwise approved by the Commissioner. Note, separate suppliers can be used for the different components, but each component must be sourced from a single manufacturer.

1.9 WARRANTY

A. Manufacturer's Tin/Zinc Coated Architectural Copper Warranty: Provide 25-yr manufacturer's warranty under provisions from this Section from Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METAL FLASHINGS AND ROOF COPINGS

A. Manufacturer's recommended alloy, temper, and gauge meeting the requirements and standards listed herein for type of use and finish indicated below.

B. Copper
   1. Copper Sheet Metal
      a. Cold-Rolled "Red" Copper Sheet Metal: Conforming to ASTM B370, coated both sides with zinc/tin alloy approximately 0.5 mils thick.
      b. 20 oz. thickness.
   2. Rivets for Metal Flashing Connections: Solid 3/16 in. dia. flat head solid copper rivets of proper length for the material being fastened. Blind or "pop" rivets are prohibited.
   3. Provide solder complying with ASTM B32, Class 50A or 50B, bar form, 50% block tin and 50% pig lead.
      a. Use an approved brand of soldering flux conforming to ASTM B813.
      b. After soldering, immediately remove all traces of acid or flux with an appropriate neutralizer followed by repeated washing and scrubbing.

C. Release Tape: 0.006 in. thick polyethylene, adhesive-backed on one side, width as required.

D. Strip Flashing for Expansion Joints
   1. 0.060 in. thick uncured self-adhered EPDM.

a. Product: Subject to compliance with requirements, provide one of the following:
   1) Quickseam, by Firestone.
   2) JM EPDM Peel and Stick Flashing, by Johns Manville.
   3) Sure-Seal EPDM, by Carlisle Syntec Systems.
   4) Or approved equal.

E. Sealant, for Use in Expansion Joint and Approved Lap Joint Construction
   1. Subject to compliance with requirements, provide one of the following:
      a. TremPro JS-773, by Tremco Incorporated.
      b. Ba-98, by Pecora Corporation.
      c. Sikalastomer 511, by Sika.
      d. Or approved equal.

2.2 FLASHING MEMBRANE

A. Basis-of-Design Product: Subject to compliance with requirements, provide Ice & Water Shield HT, by GCP Applied Technologies, Inc. or comparable product by one of the following:
   1. Henry Company.
   2. Carlisle Coatings and Waterproofing.
   3. Or approved equal.

B. Primer: As recommended by the manufacturer. All substrate to receive primer unless the manufacturer states in writing that use of primer will impair membrane performance.

C. Slip Sheet: Rosin paper.

2.3 ACCESSORIES

A. Fasteners
   1. Fasteners must account for any reduction in safe working loads due to their spacing, edge distance, embedment, location in areas of tension, or proximity to cast-in inserts/existing fasteners, or thickness of shims. Fasteners are to also consider condition, thickness, and material properties of substrate. Adhesive anchoring systems are to not be used for fasteners supporting loads in tension.
   2. All exterior fasteners or fasteners in wet areas are to be of a suitable grade of stainless steel. Weather coatings for corrosion resistance may only be used with the Commissioner's approval.
   3. All exterior fasteners that penetrate a self-sealing weatherproofing system are to be selected and coordinated with the weatherproofing system manufacturer to ensure self-sealing occurs.
   4. Fasteners Used in Cast-in-Place Concrete and Concrete Masonry Unit (CMU) Backup Construction
      a. Fastener selection and sizing must be based on applicable ICC-ES Evaluation Reports.
      b. Fastener selection and sizing must be based on testing according to ASTM E488 and ASTM E754 (for CMU construction) with the same backup wall construction used on the Project.
      c. Post installed anchors may be subject to Special Inspections as required by the New York City Building Code.
   5. When utilizing a fastener not included in any of the above references, available standards, or design guides, use a minimum factor of safety of 4 for permissible load design of anchoring assemblies.

6. Fasteners Used in Cold-Formed Steel Framing Backup Construction
   a. Fastener selection and sizing must be in accordance with the AISI Cold-Formed Steel Design Manual and ASTM C1513.
7. Contractor is to provide for Commissioner's review, documentation demonstrating that the use of all proprietary fasteners installed has been reviewed and approved by the fastener manufacturer and must, prior to installation, submit manufacturer's written certification that details proposed by the Contractor are appropriate for their intended use.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Refer to requirements in Related Sections.

B. The Contractor is to examine substrate conditions and other conditions under which this Work is to be performed and notify the Commissioner, in writing, of circumstances detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected to permit proper installation of the Work. Starting of Work means acceptance of Project conditions.

3.3 DELIVERY, STORAGE, AND HANDLING

A. Store elastomeric materials, adhesives, solvents, and sealants in their original containers and maintain at a temperature between 60°F and 80°F or as required by the manufacturer.

B. Handle all materials to avoid damage. Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Keep away from open fire, flame, or any ignition source.

C. Damaged Material: Any materials found damaged or stored in any manner other than stated above will be rejected, removed, and replaced at the Contractor's expense.

3.4 STRIP FLASHING SUBSTRATE PREPARATION

A. Prepare all substrate surfaces scheduled to receive strip flashing in accordance with the manufacturer's recommendations and requirements and as provided in this Section.

B. Continually remove all dust and debris from all concrete surfaces by sweeping and blowing with compressed air and/or vacuuming.

C. Clean and prepare metal surfaces to near white metal in accordance with SSPC-SP3 (power tool clean) or as required by membrane manufacturer. Extend preparation a minimum of 3 in. beyond the termination of the membrane flashing materials. Notch steel surfaces to provide a rust-stop.

D. In addition to cleaning, abrade all metal surfaces to provide a rough open surface. A wire brush finish is not acceptable.

E. Wipe prepared metal surface with Methyl Ethyl Ketone (MEK) or other acceptable solvent cleaner prior to application of primer.

3.5 FLASHING MEMBRANE INSTALLATION

A. Prime all surfaces to receive Flashing membrane. Allow primer to dry until it is slightly tacky.

B. Install flashing membrane per the manufacturer's instructions.

C. All laps are to be 3 in. minimum (or greater if required by the manufacturer) and shingled to shed water. Reverse laps that buck water are not allowed.

D. Correct deficiencies in or remove Flashing membrane and Flashings that do not comply with requirements; repair substrates and reapply components.

E. Install rosin paper over flashing membrane as shown on the Drawings.

3.6 GENERAL METAL INSTALLATION

A. Except as specified in this Section, comply with all recommendations of the current edition of the referenced standards. Completed metal must be straight, flat, and without buckles, dents, scratches, or other blemishes.

B. Form sheet metal on a bending brake. Perform shaping, trimming, and hand seaming in the shop as far as practicable, with the proper sheet-metal working tools. Make the angle of the bends and the folds for interlocking the metal with full regard for expansion and contraction, to avoid buckling or other deformation in service. All lines are to be straight and crisp, except where thickness of metal dictates radius bend, and all exposed edges are to be hemmed 1/2 in. minimum.

C. Soldering: Mechanically clean all metal to be soldered with stainless-steel brushes or by other acceptable means, apply flux, and pre-tin. Do not use carbon steel brushes or steel wool. Perform all soldering slowly with well-heated 3 lbs per pair coppers (irons) with properly tinned clean blunt tips. Do not use torches or irons with integral torches for soldering. Apply enough heat to sweat the solder completely through the full width of the seam. Whenever possible, do all soldering in flat position. All sloped and vertical seams must be laced and soldered a second time. Perform all soldering in shop to the extent practical. Clean all joints after soldering. Clean joints by wetting the area with water and scrubbing with a soft bristle brush. Neutralize any harmful flux residue by washing the area with a 5% neutralizing solution. Wash area with water before neutralizing. The neutralizing solution can be made by adding 3/4 cup baking soda to 1 gal of water. Rinse the neutralizing solution with running water and wipe dry.

D. Lay out Metal Flashing to minimize transverse joints. Detail transverse joints in all flashing pieces to provide a watertight connection, and allow for expansion/contraction of the metal as shown on the Drawings. Joints in metal flashings are to be lapped and riveted and fully soldered or lock-seam and fully soldered, as required herein. Space rivets at 1 in. o.c. in staggered pattern, unless otherwise indicated. Provide prefabricated corner pieces with joints treated as described below. Unless shown otherwise on the Drawings, provide expansion joints at 20 ft o.c. maximum and within 3 ft away from all changes in flashing direction (each side), and from all terminations of flashing.
   1. Clinch Lock Seams: Close clinch lock seams gently with a block of wood and mallet, then flux and show at least one-full inch of continuous and evenly flowed solder.

2. Lapped and Riveted Seams: Lap joints 3 in. minimum and space rivets at 1 in. o.c. in staggered pattern, unless otherwise indicated. Fully sweat joint with solder and install solder over exposed rivet heads.
3. Apply EPDM strip flashing at expansion joints in flashing and coping joints. Follow manufacturer's written recommendations for EPDM installation, as modified below.
   a. Apply 1 in. wide release tape over all joints and edges of the flashing to be covered by adhered EPDM sheet and where shown on the Drawings.
   b. Cut and position EPDM sheets in place and allow sheets to relax 1/2 hr after unrolling before removing backer. Inspect sheet for any discontinuities or deficiencies; do not use defective sheets.
   c. Clean and prime all metal surfaces scheduled to receive EPDM with clean, lint-free rags and allow primer to dry. Re-prime areas not covered by adhered EPDM within 12 hrs.
   d. Once the primer is dry, lay sheets into it promptly. Adhere sheets 3 in. minimum to the underlying metal on each side of the release tape. Do not move or reposition sheets. Immediately roll entire sheet into firm contact with the substrate using a smooth metal roller. Form sheets tightly into bends in flashing without stretching or cutting rubber sheet.
   e. Cover the expansion joints with hemmed-edge metal cover plates bent over the flashings as shown in the Drawings.

E. Where flashing terminates or is discontinuous, pan up ends of flashing. Solid rivet and fully solder end dams watertight prior to installation.

F. Provide 1/4 in. per foot minimum slope on all horizontal surfaces to prevent ponding, unless otherwise indicated.

G. Provide metal skirt flashing, as shown in the Drawings, to cover the waterproofing base flashing. At transverse joints, lock the adjacent skirt flashings together using a 1/2 in. flat seam or rivet together. Form a hem on the bottom edges of the skirt to form a smooth surface, and at the top to hook into the flashing receiver.

H. Provide metal receiver strips (blind nailers) at vertical terminations and as where shown on the Contract Drawings. Provide a solid bed of Sealant in joints, behind and within receiver metal.

I. Exposed fasteners are prohibited.

J. Do not penetrate the horizontal portion of any flashing with fasteners.

3.7 FIELD QUALITY CONTROL

A. Inform the Commissioner in writing on a daily basis of any of the following events. State-specific locations of each occurrence.
   1. Damage by other trades.
   2. "Oil-canning," separated, or cracked solder joints in Metal Flashings.

B. Provide site access to the authorized representative(s), including inspectors, Commissioner, and manufacturers' for inspection of the waterproofing membrane.

C. Inspections: Arrange for the Commissioner to inspect the Metal Flashings prior to installation of subsequent materials and to review the completed Work during all phases of installation and as required to assure conformance with the Contract Documents.

3.8 CLEANING AND PROTECTION

A. Refer to requirements in Related Sections.

B. Coordinate with other trades to avoid traffic over completed Work areas. Move equipment and ground storage areas as Work progresses to avoid abuse of Metal Flashing, as permitted by the City of New York. Notify the Commissioner immediately and in writing if anyone abuses or damages Metal Flashing components, and make necessary repairs without cost to the City of New York.

C. Against Loads: Protect Work of this Section against concentrated loads and any other loads or equipment that would damage the materials or Work.

D. Take and maintain necessary preventative measures to protect Work of this Section from damage until Project is accepted.

END OF SECTION 07 62 00

SECTION 07 72 33 - ROOF HATCHES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 REFERENCE STANDARDS

A. Reference Standards and Regulations

1. Comply with applicable provisions and recommendations of the standards listed below. Where standards conflict or conflict with the provisions of these Specifications, the more stringent are to apply. Unless otherwise noted, the latest editions of the standards are to apply:
   a. American Society of Testing and Materials (ASTM) and Others:
      1) ASTM A36-93a – Standard Specifications for Structural Steel
      2) ASTM A123 – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
      3) ASTM A143 – Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
      4) ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
      5) ASTM A384 – Standard Practice for Safeguarding Against Warpage and Distortion during Hot-Dip Galvanizing of Steel Assemblies
      6) ASTM A653 – Standard Specifications for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process
      7) ASTM B209-14 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
      8) ASTM B308 – Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles
      9) ASTM C208 – Standard Specification for Cellulosic Fiber Insulating Board
      10) ASTM C209 – Standard Test Methods for Cellulosic Fiber Insulating Board
      11) ASTM C553-13 (2019) – Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
      12) ASTM C591-13 – Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
      13) ASTM D4549-11 – Standard Classification System and Basis for Specification for Polystyrene and Rubber-Modified Polystyrene Molding and Extrusion Materials (PS)
   b. 2015 International Building Codes (IBC 2015)

B. System Description
   1. Roof Access Hatch: Spring Mounted in Frame: Aluminum, mill finish.

1.3 SUBMITTALS PROCEDURES

A. Refer to DDC General Conditions, Section 013300 " Submittal Procedures "

B. Product Data: Submit manufacturer's product literature and installation instructions, use limitations and recommendations.

C. Samples: Manufacturer to provide, upon request, sized to represent material adequately.

D. Technical Support: Contact the engineering group of manufacturers as stated in 2.1A.

E. Warranty: Submit a sample of manufacturer's warranty identifying the terms and conditions stated in Article 1.7 .

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 " Quality Requirements ".

B. Manufacturer Qualifications: Roof Access Hatch must be manufactured by a company with a minimum of 3 years' experience in the production of Roof Access Hatches.

C. Installer Qualifications: A firm having at least 3 years' experience in installing Roof Access Hatches.

D. Materials: For each type of material required to complete the work of this section, provide primary materials which are the products of a single manufacturer.

E. Pre-Application Conference (As needed): A pre-application conference must be held to establish procedures and to review conditions, installation procedures and coordination with other related work. Meeting agenda must include review of the special details.

F. Manufacturer's Representative: Arrange to have instructed representative of the manufacturer on site periodically to review installation procedures.

1.5 DELIVERY, STORAGE, HANDLING

A. Store products per manufacturers' instructions in unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.6 PROJECT CONDITIONS

A. Work should be performed only when existing and forecasted weather conditions are within the limits established by the manufacturer.

B. Verify that other trades with related work are complete before installing roof hatch(es).

C. Mounting surfaces must be straight and secure; substrates must be of proper width.

D. Observe all appropriate OSHA safety guidelines for this work.

E. Waste Disposal: This material is not defined as hazardous by the Resource Conservation and Recovery Act. It is the product users' responsibility to determine at the time of disposal.

1.7 WARRANTY

A. Provide 5-year manufacturer's warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1 Milcor Company.
2. The Bilco Company.
3. Babcock Davis.
4. Or approved equal.

2.2 ROOF ACCESS HATCH

A. Basis of Design: Product: Subject to compliance with requirements, provide hatch by Milcor Company RD-3x3, Single Leaf: Spring Mounted in Frame or comparable product by one of the following:

1. The Bilco Company.
2. Babcock Davis.
3. Or approved equal.

B. Size: Width 3'0" x Length 3'0". Length denotes hinge side.

C. Curb: One-piece curb and frame with integral cap flashing, 3-1/2" wide mounting flanges with pre-drilled holes.

1. Material: Aluminum, 11 gauge, .090 inch thick.
2. Finish: Mill finish.
3. Insulation: 1 inch fiberboard.
4. Height: 12 inches.

D. Metal Cover: Flush, insulated, hollow metal construction.

1. Material: Material: Aluminum, outer cover 11 gauge, .090 inch thick, liner 14 gauge, .063 inches thick.
2. Finish: Mill finish.
3. Insulation: 1 inch fiberglass.
4. Load Carrying Capacity: Capable of supporting 40 psf. live load.

5. Gasket: Extruded EPDM rubber gasket adhered to cover, continuous around cover perimeter.

E. Operating Hardware

1. Material/Finish: Steel, zinc coated and chrome plate sealed, unless otherwise indicated or required by manufacturer.
2. Lifting Mechanisms: Torsion coil spring operator assists opening upon release of latch. Covers open to 90 degrees.
3. Hinges: Manufacturer's recommended type for specified model.
4. Hold-Open: Inside latching device, with inside and outside handles and inside padlock hasp, automatically engages upon closing.

2.3 PERFORMANCE REQUIREMENTS

A. General characteristics

1. Cover must be reinforced to support a minimum live load of 40 psf (195 kg/m^2) with a maximum deflection of 1/150th of the span or 20 psf (97 kg/m^2) wind uplift.
2. Operation of the cover must be smooth and easy with controlled operation throughout the entire arc of opening and closing.
3. Operation of the cover must not be affected by temperature.
4. Entire hatch must be weathertight with fully welded corner joints on cover and curb.

B. Cover: Must be 11 gauge (2.3mm) aluminum with a 3" (76mm) beaded flange with formed reinforcing members. Cover must have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.

C. Cover insulation: Must be fiberglass of 1" (25mm) thickness, fully covered and protected by a metal liner 18 gauge (1mm) aluminum.

D. Curb: Must be 12" (305mm) in height and of 11 gauge (2.3mm) aluminum. The curb must be formed with a 3-1/2" (89mm) flange with 7/16" (11mm) holes provided for securing to the roof deck. The curb must be equipped with an integral metal cap flashing of the same gauge and material as the curb, fully welded at the corners, that features a flashing system, including stamped tabs, 6" (153mm) on center, to be bent inward to hold single ply roofing membrane securely in place.

E. Curb insulation: Must be rigid, high-density fiberboard of 1" (25mm) thickness on outside of curb.

F. Lifting mechanisms: Manufacturer must provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube must be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube must interlock with a flanged support shoe for aluminum construction: welded to the curb assembly.

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify that Roof Access Hatch installation will not disrupt other trades. Verify that the substrate is dry, clean, and free of foreign matter. Report and correct any defects prior to any installation.
B. Verify by comparing packing slip and box label that product is per specification.

3.3 SURFACE PREPARATION

A. Refer to manufacturer's product literature for surface preparation requirements. Surfaces should be structurally sound, free of voids, spalls, loose aggregate and sharp ridges. Remove dust, dirt, debris or any other foreign materials.

3.4 INSTALLATION

A. Submit product design drawings for review and approval to the Commissioner before fabrication.
B. Installer will check as-built conditions and verify the manufacturer's roof hatch details for accuracy to fit the applications prior to fabrication. The installer must comply with the roof hatch manufacturer's installation instructions.
C. The installer must furnish mechanical fasteners consistent with the roof requirements.

3.5 CLEANING AND PROTECTION

A. Product requires no spill or leak containment. Dispose of damaged material in accordance with OSHA Safety and Health Regulations for Construction.
B. Protect completed work from subsequent construction activities as recommended by manufacturer.

END OF SECTION 07 72 33

SECTION 07 84 13 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2. SUMMARY

A. Section Includes:

1. Penetrations in horizontal assemblies.

B. Related Sections:

1. Section 07 92 00 “Joint Sealants”.

1.3. SYSTEM DESCRIPTION

A. Firestopping will be provided in the following locations.

1. Duct, cable, conduit, piping and their supports that penetrate through floor slabs, fire-rated partitions, fire walls, and exterior walls where rated. Firestopping will be provided for all new penetrations; penetrations left open by demolition/removal of duct, cable, conduit, and pipe; damaged fire stopping, and existing abandoned penetrations in the work area.
2. Penetrations of vertical shafts.
3. Around openings and penetrations through fire-rated ceiling assemblies.
4. Other locations shown specifically on the drawings or were called for in other sections of the specifications.

B. Performance Requirements:

1. Materials or combinations of materials used for fire stopping will be noncombustible and comply with the following as a minimum:

a. Flame Spread: 25 or less, as measured by ASTM E-84
b. Smoke Developed: 100 or less, as measured by ASTM E-84

2. Fire stopping will be asbestos free and will be non-toxic to humans during installation and fire conditions.
3. Examination of work by the Contractor:

a. It will be the responsibility of the Contractor to provide firestopping for the entire project. The Contractor will examine the area to receive fire stopping prior to beginning work or to submitting the data required herein.
b. Data to be submitted will be based on the findings of the Contractor's examination.

1.4. SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5. SUBMITTALS

A. Action Submittals:

1. Product Data: For each type of product indicated.
2. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.
3. Detail Drawings: Contractor must submit detailed drawings of each listed assembly for each type of penetration, for each trade.

B. Informational Submittals:

1. Qualification Data: For qualified Installer.
2. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.
3. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

1.6. QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Manufacturers Qualifications: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1. American Society for Testing and Materials (ASTM) Publications:

a. E-84 Standard Test Method for Surface Burning Characteristics of Building Materials
b. E119 Standard Test Method For Fire Tests of Building Construction and Materials
c. E814 Test Method of Fire Tests of Through-Penetration Fire stops
d. E1966 Fire Resistive Joint Systems
e. EB99 Cyclic Movement And Measuring The Min & Max Joint Widths of Arch Joint Systems

2. Underwriters Laboratories (UL) Publications:

a. UL-1479 Fire Tests of Through-Penetration Fire Stops
b. UL-2079 Tests for Fire Resistance of Building Joint Systems
c. FRD Fire Resistance Directory

C. Pre-Installation Conference

1. Conduct a pre-installation conference with all sub-contractor representatives to verify project requirements, substrate conditions, manufacturer’s installation instructions, and manufacturer’s requirements.

1.7. DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site in original, unopened packages with intact and legible manufacturers’ labels identifying product and manufacturer, date of manufacture, and shelf life if applicable.

B. Store materials inside, under cover, above ground, and keep dry and protected from physical damage until ready for use. Remove from site and discard wet or damaged materials.

1.8. COORDINATION

A. Coordinate installation of all penetration firestopping systems with mechanical, electrical, fire protection, and other trades so that installation is complete and to minimize rework due to the addition of penetrants or other modifications.

PART 2 – PRODUCTS

2.1. GENERAL

A. All firestopping used throughout the project will be the products of a single manufacturer.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hilti.
2. 3M.
3. Specified Technologies, Inc.
4. Nelson.
5. Tremco.
6. Or approved equal.

2.2. FIRESTOPPING, GENERAL

A. General: Use only firestopping products that have been tested for specific fire-resistance-rated construction conditions conforming to construction assembly type, penetrating item type or joint opening width and movement capabilities, annular space requirements, and fire-rating involved for each separate instance.

B. Provide through-penetration firestop systems that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

C. Provide components for each through-penetration firestop system that are needed to install fill materials. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

D. Fire Resistance Rating: Firestop systems will be UL Fire Resistance listed or FM P7825a approved with “F” rating at least equal to fire-rating of fire wall or floor in which penetrated openings are to be protected, except that “F” rating may be 3 hours in through-penetrations of 4-Hour fire rated wall or floor. Firestop systems will also have “T” rating where required.

E. Through-Penetrations: Firestopping materials for through-penetrations will provide “F” and “T” fire resistance ratings in accordance with ASTM E 814 or UL 1479.

F. Construction Joints And Gaps: Construction joints and gaps will be provided with firestopping materials and systems that have been tested per ASTM E 119, ASTM E 1966 or UL 2079 to meet the required fire resistance rating. Systems installed at construction joints

will meet the cycling requirements of ASTM E 1399 or UL 2079.

2.3. FIRESTOPPING SYSTEMS

A. All-Weather Coatings: Moisture curing, single component silicone copolymer elastomeric spray coatings for horizontal surfaces where greater water resistance is required or inclement weather is anticipated.

B. Cast-In-Place Firestop Device: Single component molded firestop device installed on forms prior to concrete placement with totally encapsulated, tamper-proof integral firestop system and smoke sealing gasket.

C. Composite Sheet: Intumescent material sandwiched between a galvanized steel sheet and steel wire mesh protected with aluminum foil capable of sustaining a minimum 2,500 lbs (1,134 kg) when subjected to load testing.

D. Elastomeric Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture and accommodate minimum ±25 percent movement.

1. Elastomeric sealant required for fire-stopping will be single component, neutral-cure silicone sealant conforming to ASTM E 814 (UL 1479)
2. Products: Subject to compliance with requirements, provide one of the following:

a. 3M Fire Barrier Silicone Sealant 2000+.
b. Everkem FireStop 814+.
c. BOSS 814 Firestop Sealant.
d. Or approved equal.

E. Endothermic Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture.

F. Fire Rated Cable Pathways: Gangable device modules capable of being retrofitted around existing cables and comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill and requiring no additional action in the form of plugs, twisting closure, putty, pillow, or sealant to achieve fire and leakage ratings.

G. Fire-Rated Cable Grommet: Molded two-piece grommet made from plenum grade polymer with a foam inner core for sealing cable penetrations up to 0.53 in. (14 mm) diameter.

H. Fire-Rated Closet Flange Gasket: Molded, single-component, intumescent gasket for use beneath a closet flange in floor applications.

I. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestop gasket for use on steel HVAC ducts.

J. Fire-Rated T Rating Collar Device: Louvered steel collar system with synthetic aluminized polymer coolant wrap installed on metallic pipes where T Ratings are required by New York City Building Code requirements.

K. Firestop Devices: Factory-assembled steel collars lined with intumescent material capable of expanding a minimum 30 times sized to fit specific outside diameter of penetrating item.

L. Firestop Pillows: Re-enterable, non-curing, mineral fiber core encapsulated with an intumescent coating on all six sides contained in a flame-retardant poly bag.

M. Firestop Plugs: Re-enterable, foam rubber plug impregnated with intumescent material

capable of expanding minimum 10 times with expansion beginning at 350°F (177°C) for use in blank openings and cable sleeves.

N. Firestop Putty: Intumescent, 100% solids, non-hardening, water resistant, butyl rubber-based putties containing no solvents or silicone compounds.

O. Intumescent Sealants: Single component intumescent latex formulations containing no water-soluble intumescent ingredients capable of expanding a minimum eight times.

P. Mortar: Portland cement based dry-mix product formulated for mixing with water at Project site to form a non-shrinking, water-resistant, homogenous mortar.

Q. Safing Insulation: Board or sheet products used as forming materials in slab-edge openings with the capacity to provide a degree of the fire resistance required when used with an appropriate fill material.

R. Silicone Foam: Multicomponent, silicone-based liquid elastomers, that when mixed, expand and cure in place to produce a flexible, non-shrinking foam.

S. Silicone Sealants: Moisture curing, single component, silicone elastomeric sealant for horizontal surfaces (pourable or nonsag) or vertical surface (nonsag).

T. Wall Opening Protective Materials: Intumescent, non-curing pads or inserts for protection of electrical switch and receptacle boxes to reduce horizontal separation to less than 24” (610 mm).

U. Wrap Strips: Single component intumescent elastomeric strips faced on both sides with a plastic film and capable of expanding a minimum 30 times.

PART 3 – EXECUTION

3.1. EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2. SURFACE PREPARATION

A. Prior to application, remove from surfaces all dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting or required fire resistance of the fire stopping material for cast-in-place firestop devices, formwork or metal deck to receive device prior to concrete placement and will be sound and capable of supporting device. Prepare surface as recommended by the manufacturer.

3.3. INSTALLATION

A. Install in accordance with approved construction drawings (shop drawings), approved manufacturer's literature, installation instructions, UL Design Number or UL Report, and the following requirements:

B. Fire stopping materials will completely fill the void space regardless of geometric configuration, subject to tolerances established by the manufacturer when intumescent materials are used.

C. Apply fire stopping materials at penetrations of insulated pipes and ducts, prior to application of the insulation. If insulation is already in place, remove it at the penetration prior to application of the fire stopping materials, except where intumescent materials are used and removal is not necessary per manufacturer's instructions. Removed insulation will be replaced with a material having equal thermal insulation characteristics and equal fire stopping characteristics.

D. Fire stopping for filling voids in floors, in which the smallest dimension is 101mm or more, will support the same load as the floor is designed or will be protected by a permanent barrier to prevent loading or traffic on the fire stopped area.

E. To provide a two-hour enclosure of chases where walls or floors are penetrated by plastic drain, waste, and vent pipes, encase the pipe in a 456mm steel sleeve that penetrates the chase at a 45-degree downward angle. As an alternative, providing intumescent fire stopping systems listed for the plastic piping installation will be acceptable.

F. Cable tray penetrations will be protected by either UL-listed through penetration fire stop devices or through penetration fire stop systems that are re-enterable. Where penetrating cables in a cable tray are removed, replaced, or added, restoration will be accomplished in an approved manner; the allowable number of penetrating items will not be exceeded; only permitted penetrations will be installed; and adequate clearances will be maintained among penetrations, between penetrations, and the sides of the opening.

G. Damaged, disrupted, or removed fire stopping will be replaced with new.

H. Firestopping will not be applied in conjunction with fire dampers, smoke dampers, or combination fire/smoke dampers unless specifically required by the damper manufacturer installation instructions.

3.4. INSPECTION

A. Approved installation instructions will be present at each work area prior to the beginning of work and a test installation will be produced for quality check by the Commissioner. The test installation will be subject to inspection and/or test for conformance with work requirements. Periodic quality checks will be performed at the discretion of the Commissioner, and should installation prove to be substandard, all fire stopping installed up to that time, not meeting approved standards, will be replaced at no additional cost to the City of New York.

B. The area of work will remain available for inspection by the Commissioner before and after application of fire stopping.

C. Notification: Notify the Commissioner at least 24 hours prior to installation of fire stopping in each area to allow opportunity for inspection.

D. The Contractor will submit written reports indicating locations of and types of penetrations and types of fire stopping used at each location; type will be recorded by UL listed printed numbers. Contractor records will be maintained on site and provided to the Commissioner upon arrival for inspections.

3.5. CLEANING AND PROTECTION

A. At end of each workday, remove rubbish and other discarded materials from Project site.

B. Protect the work of other trades and work of this Section already installed against soiling and damage by the exercise of reasonable care and precautions. Restore or replace any work so damaged or soiled.

C. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

END OF SECTION 07 84 13

SECTION 07 92 00 - JOINT SEALANTS

PART 1 – GENERAL

1.1. RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2. SUMMARY

A. Caulk and seal joints as specified.

1. Sealing of interior perimeter joints at door frames, window frames, and other wall openings.
2. Sealing of joints between adjacent floor and wall materials.

B. Related Sections:

1. Section 09 29 00 “Gypsum Board”.

1.3. SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4. SUBMITTALS

A. Product Data: Submit manufacturer's printed product data, specifications, standard details, installation instructions, use limitations and recommendations for each sealant material used. Provide certifications that sealant materials comply with specified requirements.

B. Samples:

1. Submit actual representative samples of each sealant material that is to be exposed in the completed work. Show full color ranges and finish variations expected. Provide sealant samples having minimum size of 4 in. long.

C. Test Reports: Provide certified reports for all specified tests.

1.5. QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Source: For each sealant material type required for the work of this section, provide primary materials which are the product of one manufacturer. Provide secondary or accessory materials which are acceptable to the manufacturers of the primary materials.

C. Installer: A firm with a minimum of three years’ experience in the type of work required by

this Section and which is acceptable to the manufacturers of the primary materials.

1.6. COMPATIBILITY

A. Provide sealant and sealant joint backing materials suitable for the use intended and compatible with the materials with which they will be in contact. Compatibility of sealant and accessories will be verified by the sealant manufacturer.

B. Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates as follows:

1. Locate test joints where indicated or, if not indicated, as directed by the Commissioner.
2. Conduct field tests for each application indicated below:
    a. Each type of elastomeric sealant and joint substrate is indicated.
    b. Each type of non elastomeric sealant and joint substrate indicated.
3. Notify the Commissioner seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
5. Test Method: Test joint sealants by hand-pull method described below:
    a. Install joint sealants in 60 inches long joints using the same materials and methods for joint preparation and joint-sealant installation required for the completed Work. Allow sealants to cure fully before testing.
    b. Make knife cuts from one side of joint to the other, followed by two cuts approximately 2 inches long at sides of joint and meeting crosscut at one end. Place a mark 1 inch from cross-cut end of 2 inches piece.
    c. Use fingers to grasp 2 inches piece of sealant between cross-cut end and 1 inch mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler alongside of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
    d. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending the cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.
6. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.7. PROJECT CONDITIONS

A. Substrates: Proceed with work only when substrate construction and penetration work is complete.

1.8. PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Materials under this Section will be delivered to, and stored at, the job site in unbroken factory sealed containers with labels intact.

PART 2 – PRODUCTS

2.1. GENERAL REQUIREMENTS

A. Before installation check each sealant for compatibility with adjacent materials and surfaces and with indicated exposures. Select sealants which are recommended by the manufacturer for each application indicated. Where exposed to pedestrian traffic, provide sealants which are non-tracking and are strong enough to withstand the traffic without damage.

B. Provide colors as selected by Commissioner from manufacturer's standard and special colors. Where specifically requested, provide custom color matches.

2.2. SILICONE RUBBER SEALANT (INTERIOR)

A. Provide one part, silicone rubber based elastomeric sealant, complying with ASTM C 920 Type S, Class 25, Grade NS and Fed. Spec. TT-S-001543A Class A.

B. Provide mold and mildew resistant, sanitary interior type sealant.

C. Extent: Provide silicone rubber sealant for interior joints around plumbing fixtures and tile to tile joints in ceramic tile work.

2.3. ACRYLIC LATEX SEALANT

A. Provide permanently flexible, latex rubber modified acrylic emulsion sealant, complying with ASTM C 834.

B. Extent: Provide acrylic latex sealant for interior joints except where silicone rubber sealant is indicated.

C. At interior joints greater than 1/2 in. in width or subjected to periodic building movement, substitute exterior type sealant specified above.

D. Where surrounding wall surfaces are to be left unpainted, substitute exterior type sealant as specified above.

2.4. MISCELLANEOUS MATERIALS

A. Primer: Provide primer recommended by sealant manufacturer for surfaces to be adhered to.

B. Bond Breaker Tape: Provide polyethylene or other plastic tape recommended by sealant manufacturer to prevent three-sided adhesion.

C. Backer Rod: Provide compressible rod of durable nonabsorptive material recommended by sealant manufacturer for compatibility with sealant.

D. Reticulated Foam Weeps: At historic windows, louvers, and elsewhere as indicated, provide PVC-coated reticulated foam weeps:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. HO Products.
b. Tom Brown Inc.
c. Frank Lowe.
d. Or approved equal.

E. Joint backing for general use at joints in horizontal surfaces will consist of two rows of butyl rubber or neoprene foam rod in contact with one another, and each compressed to approximately 2/3 original width when in place.

F. Provide miscellaneous materials of type that will not bleed through sealant, discolor surface, or produce other deleterious effects. Select size to provide compression to approximately 2/3 original width when in place. Provide backing material profile concave to the rear of the sealant, and equipped with a bond- breaking film.

PART 3 – EXECUTION

3.1. EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2. INSPECTION

A. The Installer will examine substrates and conditions under which this work is to be performed and notify the Contractor, in writing, of conditions detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions are corrected.

3.3. PREPARATION

A. Strictly comply with manufacturers' instructions and recommendations, except where more restrictive requirements are specified in this Section.

B. Clean joint surfaces immediately before installation of sealants, primers, tapes and fillers. Remove substances which could interfere with bond. Etch or roughen joint surfaces to improve bond. Surfaces which have been given protective coatings and those that contain oil or grease will be thoroughly cleaned with xylol or MEK solvent, with due precautions taken to minimize hazards.

C. Unless otherwise indicated, use of sealants will conform to the following: ASTM C 790 for latex sealants and ASTM C 962 for other sealants.

D. Tape or mask adjoining surfaces to prevent spillage and migration problems.

E. Prime surfaces as recommended by sealant manufacturer.

3.4. INSTALLATION

A. Provide backer rods for joint sealants except where specifically recommended against by sealant manufacturers.

B. Prevent three-sided adhesion by use of bond breaker tapes or backer rods.

C. Force sealant into joints to provide uniform, dense, continuous ribbons free from gaps and air pockets. Completely wet both joint surfaces equally on opposite sides.

D. Except in hot weather, make the sealant surface slightly concave. Install sealants so that compressed sealants do not protrude from joints. Dry tool sealants to form a smooth dense surface. At horizontal joints form a slight cove to prevent trapping water.

E. Provide sealants to depths indicated, or if not indicated, follow manufacturer's recommendations. For joints up to 3/8 in. width, depth of joint will not exceed 1/2 in.; for joints larger than 1/2 in. width, depth of joint will not exceed 5/8 in.

3.5. EXTENT OF SEALANT WORK

A. General Extent: Seal joints at all interior and exterior joints, seams, and intersections between dissimilar materials. Provide elastomeric sealant installation with backer rod in all interior and exterior control joints.

B. Interior Sealing: The work of this Section includes sealing the following at all new work included under this work:

1. Perimeters of door frames, window frames, and metal and wood frames.
2. Metal to gypsum wallboard joints, including joint between acoustical ceiling metal wall angle and adjacent gypsum wallboard.
3. Top of wall base along irregular walls.
4. Splash to counter joints and splash to wall joints at countertops.
5. Completely around plumbing fixtures, fittings, and trim replaced under the work of this work, including water closet base, replacement kitchen sinks, and all other similar locations.

3.6. CURING

A. Cure sealants in strict compliance with manufacturers' instructions and recommendations to obtain the highest quality surface and maximum adhesion. Make every effort to minimize accelerated aging effects and increase in modulus of elasticity.

3.7. CLEANING AND PROTECTION

A. Remove smears from adjacent surfaces immediately, as the work progresses. Exercise particular care to prevent smearing or staining of surrounding surfaces which will be exposed in the finished work, and restore any damage done to same as result of this work without additional cost to the City of New York.

B. Remove and replace work that is damaged or deteriorated.

C. Clean adjacent surfaces using materials and methods recommended by sealant manufacturer. Remove and replace work that cannot be successfully cleaned.

D. Provide temporary protection to ensure work being without damage or deterioration at time of substantial completion. Remove protection immediately before substantial completion.

END OF SECTION 07 92 00

SECTION 09 01 20.91 - PLASTER 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. Requirements for materials and installation of plaster restoration system as shown on Drawings and as specified herein to complete work.

    a. Restore distress and construction deficiencies in portland cement-based plaster walls and ceilings.
    b. Restore nonstructural cracks in brown coat and finish.
    c. Restore flashing and waterproofing deficiencies at plaster system terminations.
    d. Resurface wall to provide uniform appearance.

B. Related Sections:

1. Section 06 10 00 “Rough Carpentry”.
2. Section 09 29 00 “Gypsum Board”.
3. Section 09 91 00 “Painting”.

1.3. DESIGN REQUIREMENTS

A. Determine restoration scope and detail design requirements based on inspection of the field conditions.

B. Provide crack restoration detail for cracks not wider than 1/16-inch nominal width.

C. Provide crack restoration detail for cracks wider than 1/16-inch but not wider than 1/8-inch.

D. Provide restoration and/or replacement details for applicable conditions listed in "Project Conditions" of this specification and indicate locations of each restoration on project drawings. Flashing remediation will be based on standard flashing requirements listed below and indications of distress or leakage observed during inspection.

E. Indicate on the project drawings locations where resurfacing, refinishing, and/or recoating is required.

F. Provide detail drawings consistent with manufacturer's guideline details and product installation instructions.

G. Where lath is cut to facilitate restorations, wire-tie replacement lath to surrounding lath with 1/2-inch overlap.

1.4. PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Identify locations of existing plaster for restoration. Identify extent and nature of deterioration.

1.5. SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.6. SUBMITTALS

A. Restore and coating manufacturers’ specifications, details, installation instructions and product data.

B. Shop Drawings: Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.

C. Samples for approval as directed by Commissioner.

1.7. QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Manufacturer’s Qualifications:

1. Plaster and finish material manufacturer will be experienced provider of cementitious and polymer- based materials for use in plaster construction and restoration for minimum three (3) years.

2. Plaster and finish manufacturer will have a manufacturing quality control system that is certified to comply with ISO 9001-2008 and an environmental quality management system certified to comply with ISO 14001-2004.

C. Special Experience Qualifications:

1. Installer Qualifications: An entity meeting the requirements of DDC General Conditions Section 01 40 00 1.7/C/1.

1.8. DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials in their original sealed containers bearing manufacturer's name and product identification.

B. Protect liquid products (pails) from freezing and temperatures greater than 90 degrees F (32 degrees C). Do not store in direct sunlight.

C. Protect portland cement based materials (bag products) from moisture and humidity. Store under cover and off of the ground in a dry location.

1.9. PROJECT/SITE CONDITIONS

A. Apply materials only when surface and ambient temperatures are above 40 degrees F (4 degrees C) and are expected to remain above 40 degrees F (4 degrees C) for 24 hours after application.

B. Provide supplementary heat for installation depending on temperatures less than 40 degrees F (4 degrees C).

C. Provide protection of surrounding areas and adjacent surfaces from spillage, splatter, overspray or other unintended contact with the materials that are being applied.

1.10. COORDINATION AND SCHEDULING

A. Schedule restorations to permit inspections during preinstallation meeting.

B. Do not start restorations in an area unless sufficient work can be completed such that the area is weather-tight at the end of the work shift. Alternatively allow sufficient time before the end of the work shift to provide weather protection until work can resume.

C. Coordinate with all trades involved to schedule work to result in the proper sequencing of materials within the restoration (proper lapping of water resistive system components and flashing).

D. Schedule finish and coating application to large areas such that each day's application will end at an architectural break.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

A. Single Source Limitation: Provide plaster, surface leveling, primer, waterproofing, and coatings (as applicable) from single manufacturer:

B. Provide galvanized metal lath and plaster accessory components from qualified manufacturer.

2.2. PLASTER MATERIALS

A. Portland Cement: ASTM C 150/C 150M, Type I

1. Color for Finish Coats: Match existing.

B. Masonry Cement: ASTM C 91, Type N.

1. Color for Finish Coats: Match existing.

C. Plastic Cement: ASTM C 1328.

D. Colorants for Job-Mixed Finish Coats: Colorfast mineral pigments that produce finish plaster color to match existing.

E. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.

F. Sand Aggregate: ASTM C 897.

1. Color for Job-Mixed Finish Coats: To match existing.

G. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, coloring agents, and ingredients.

1. Color: Match existing.

H. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems formulated with colorfast mineral pigments and fine aggregates; for use over cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.

1. Color: Match existing.

2.3. PLASTER MIXES

A. General: Comply with ASTM C 926 for applications indicated.

1. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. of cementitious materials.

B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:

1. Portland Cement Mixes:

a. Scratch Coat: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

b. Brown Coat: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

2. Masonry Cement Mixes:

a. Scratch Coat: Mix 1 part masonry cement and 2-1/2 to 4 parts aggregate.

b. Brown Coat: Mix 1 part masonry cement and 3 to 5 parts aggregate, but not less than volume of aggregate used in scratch coat.

3. Portland and Masonry Cement Mixes:

a. Scratch Coat: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

b. Brown Coat: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

4. Plastic Cement Mixes:

a. Scratch Coat: Mix 1 part plastic cement and 2-1/2 to 4 parts aggregate.

b. Brown Coat: Mix 1 part plastic cement and 3 to 5 parts aggregate, but not less than volume of aggregate used in scratch coat.

5. Portland and Plastic Cement Mixes:

a. Scratch Coat: For cementitious material, mix 1 part plastic cement and 1 part portland cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

b. Brown Coat: For cementitious material, mix 1 part plastic cement and 1 part portland cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat. C. Single base (scratch) coat for two-coat plasterwork on low-absorption plaster bases as follows:

1) Portland Cement Mix: For cementitious material, mix 1 part portland cement and 0 to 3/4 part lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

2) Portland and Masonry Cement Mix: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

3) Plastic Cement Mix: Use 1 part plastic cement and 2-1/2 to 4 parts aggregate.

C. Single base (scratch) coat for two-coat plasterwork on high-absorption plaster bases as follows:

1. Portland Cement Mix: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 2-1/2to 4 parts aggregate per part of cementitious material.
2. Masonry Cement Mix: Use 1 part masonry cement and 2-1/2 to 4 parts aggregate.
3. Portland and Masonry Cement Mix: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
4. Plastic Cement Mix: Use 1 part plastic cement and 2-1/2 to 4 parts aggregate.

D. Job-Mixed Finish-Coat Mixes:

1. Portland Cement Mix: For cementitious materials, mix 1 part portland cement and 1-1/2 to 2 parts lime. Use 1-1/2to 3 parts aggregate per part of cementitious material.
2. Masonry Cement Mix: Use 1 part masonry cement and 1-1/2 to 3 parts aggregate.
3. Portland and Masonry Cement Mix: For cementitious materials, mix 1 part portland cement and 1 part masonry cement. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
4. Plastic Cement Mix: Use 1 part plastic cement and 1-1/2 to 3 parts aggregate.

E. Factory-Prepared Finish-Coat Mixes: For ready-mixed finish-coat plasters or acrylic-based finish coatings, comply with manufacturer's written instructions.

1. Elastomeric architectural coating for plaster, masonry and concrete. Complies with and is listed by SWR Institute Validation Program for Wall Coatings.

2.4. MIXING

A. Mix in accordance with manufacturer’s printed instructions.

B. Mix cementitious products with clean, potable water.

2.5. ACRYLIC CRACK FILLER

A. Provide acrylic crack filler. Acrylic-based crack filler packaged in sealant tube for use (unreinforced) in restoration of cracks not wider than 1/16-inch and up to 1/8-inch wide with mesh reinforcement.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Sto Flexible Crack Filler.
b. Sashco Mor Flexx.
c. Sika Crack Seal.
d. Or approved equal.

2.6. ACCESSORIES

A. General: Comply with ASTM C 1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Surface Conditioner: Provide acrylic polymer surface conditioner for pretreatment of friable, chalking, or heavily weathered existing coating surfaces.

C. Glass Fiber Mesh Reinforcement: Provide alkali resistant, open weave glass fiber mesh reinforcing for surface leveling and waterproof base coat.

D. Diamond-Mesh Lath: Flat or Self-furring as required to match existing, 2.5 lb/sq. yd.

E. Metal Accessories:

1. External- (Outside-) Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized-zinc coating.

2. Cornerbeads: Fabricated from zinc or zinc-coated (galvanized) steel.

3. Casing Beads: Fabricated from zinc or zinc-coated (galvanized) steel; square-edged style; with expanded flanges.

4. Control Joints: Fabricated from zinc or zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.

2.7. MISCELLANEOUS MATERIALS

A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Fasteners for Attaching Metal Lath to Substrates: ASTM C 1063.

C. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter unless otherwise indicated.

2.8 PERFORMANCE REQUIREMENTS

A. Where indicated on construction documents, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E119 by a qualified testing agency.

B. Where indicated on construction documents provide cement plaster assemblies identical to those of assemblies tested for STC ratings according to ASTM E90 and classified according to ASTM E413 by a qualified testing agency.

PART 3 - EXECUTION

3.1. EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2. EXAMINATION

A. Inspect locations identified on the project drawings for restoration.

B. Establish clear understanding of the restoration scope and process with the mechanics that will perform the work for each individual location.

3.3. SELECTIVE DEMOLITION

A. Use hearing, eye, ear and respiratory personal protective equipment when performing demolition.

B. Provide adequate protection to persons and property from potential falling debris from demolition and restoration construction.

C. Plaster Removal:

1. Saw cut perimeter of restoration area with a masonry blade set to a depth that will not cut into the sheathing.

2. Chip plaster at the edges of the saw cut to provide a minimum 1/2-inch perimeter of exposed lath where lath is to be restored or replaced.

3. Remove plaster such that patches will be square or rectangularly shaped. Avoid re-entrant corners within patches and constructing patches with greater than 2.5:1 length-to-width ratios.

D. Finish removal:

1. Remove finish where required to cosmetically match finish texture with surrounding unaltered plaster. Finish will be removed minimum 1-inch around the perimeter of saw-cut or chipped areas, and on both sides of cracks to be restored using crack-filling and bridging techniques. (Note: removal of finish can be omitted along crack repairs. However, a trial area should be done to verify that the finished appearance will comply with the Commissioner’s requirements because the crack repair will likely be visible.)

2. Finish removal will be by grinding, scraping, or chemical stripping product approved by the Commissioner.

3. Use chemical stripping products in accordance with the product manufacturer’s written instructions.

4. Dispose of waste and rinse water from chemical stripping of finish in accordance with the New York City Building Code.

3.4. RESTORATION OF CRACKS 1/16-INCH WIDE AND SMALLER

A. Cracks not wider than 1/32-inch (hairline cracks).

1. Prepare and clean existing surface in accordance with this specification section.

2. Coat wall surface with Elastomeric Coating in accordance with written product instructions.

B. Cracks not wider than 1/16-inch

1. Remove finish along crack as specified herein.

2. Clean crack using oil-free compressed air.

3. Seal crack with flexible crack filler and tool surface flush with brown coat.

4. Apply new finish to match surrounding texture and color.

3.5. RESTORATION OF CRACKS 1/16-INCH WIDE TO MAXIMUM 1/8-INCH WIDE

A. Remove finish along crack as specified herein.

B. Clean crack using oil-free compressed air.

C. Fill crack with flexible crack filler and tool surface flush.

D. Apply skim coat material along both sides of crack and tool flat. Embed 2-inch wide strip mesh generally centered on crack and tool into fresh skim coat material using taping knife. Tool smooth to the thickness required to fully embed the mesh (approximately 1/16-inch thick). Allow skim coat to dry completely before applying finish.

E. Apply new finish to match surrounding texture and color.

3.6. CLEANING AND PROTECTION

A. Provide full protection for surrounding materials, such as wood, glass, metal which could be damaged by the work of this section.
B. As work proceeds and upon completion, promptly remove all dust and debris. Keep work area free of debris and excess materials, tools, and equipment.
C. Install protection at the completed work to keep clean and free of damage by other trades until substantial completion and final acceptance of the work.
D. At completion, remove protective coverings and remove residue resulting from same.

END OF SECTION 09 01 20.91

SECTION 09 23 00 - GYPSUM PLASTERING

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. Work of this Section Includes:

1. Gypsum plasterwork on expanded-metal lath.

B. Related Sections:

1. Section 09 91 00 “Painting”.

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 locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.

1.5. QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Mockups: Before plastering, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install mockups for the following applications:

a. Troweled Finishes: Surfaces indicated to receive nontextured paint finishes.
b. Surfaces with float finishes.

2. Simulate finished lighting conditions for review of mockups.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6. DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.7. PROJECT CONDITIONS

A. Comply with ASTM C 842 requirements or gypsum plaster manufacturer's written recommendations, whichever are more stringent.

B. Room Temperatures: Maintain temperatures at not less than 55 deg F or greater than 80 deg F for at least seven days before application of gypsum plaster, continuously during application, and for seven days after plaster has set or until plaster has dried.

C. Avoid conditions that result in gypsum plaster drying out too quickly.

1. Distribute heat evenly; prevent concentrated or uneven heat on plaster.
2. Maintain relative humidity levels for prevailing ambient temperature that produce normal drying conditions.
3. Ventilate building spaces in a manner that prevents drafts of air from contacting surfaces during plaster application and until plaster is dry.

PART 2 - PRODUCTS

2.1. STEEL FRAMING FOR SOLID-PLASTER PARTITIONS

A. Components, General: Comply with ASTM C 841. For steel sheet components not included in ASTM C 841, comply with ASTM C 645 requirements for metal unless otherwise indicated.

B. Channel Studs: Cold-rolled channels, 3/4 inch deep.

C. Runners: L-runners with perforated or plain legs to suit lath attachment requirements, in 0.033-inch base- metal thickness where attached to overhead support and in 0.043-inch base-metal thickness where attached to floor.

2.2. EXPANDED-METAL LATH

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. CEMCO.
2. Dietrich Metal Framing; a Worthington Industries company.
3. MarinoWARE.
4. Or approved equal

B. Expanded-Metal Lath: ASTM C 847, cold-rolled carbon-steel sheet, ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coated.

1. Diamond-Mesh Lath: Self-furring, 2.5 lb/sq. yd.

2.3. ACCESSORIES

A. General: Comply with ASTM C 841 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Metal Accessories:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CEMCO.

b. Dietrich Metal Framing; a Worthington Industries company.
c. MarinoWARE.
d. Or approved equal.

2. Cornerite: Fabricated from expanded-metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
3. Striplath: Fabricated from expanded-metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
4. Cornerbeads: Fabricated from zinc-coated (galvanized) steel. Match existing.
5. Casing Beads: Fabricated from zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
6. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
7. Expansion Joints: Fabricated from zinc-coated (galvanized) steel; folded pair of unperforated screeds in M- shaped configuration; with expanded flanges.

C. Metal Trim And Accessories: Custom Shaped Extrusions, Refer to Drawings:

1. Scope: Including floating base, ceiling reveals, corner reveals, and control joints.

a. 2 foot- by 2 foot-long preformed corners with inter-locking pins to assure alignment.
b. Minimum Thickness: 1/8 inch, except where tapered flange is required for plaster finish.
c. Factory Finish: White, baked finish.

2. At ceiling perimeters, furnish edge trims with vertical leg sized to suit each condition where ceiling is integrated with perimeter framing, lighting and linear diffusers.

2.4 MISCELLANEOUS MATERIALS

A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of
damaging plaster, lath, or accessories.

B. Bonding Compound: ASTM C 631.

C. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.

D. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 841.

E. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter, unless otherwise indicated.

F. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

G. Acoustical Sealant: As specified in Section 07 92 00 "Joint Sealants”.

2.5. BASE-COAT PLASTER MATERIALS

A. Base-Coat Plasters, General: ASTM C 28/C 28M.

B. Lightweight Gypsum Ready-Mixed Plaster: With mill-mixed perlite aggregate.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. National Gypsum Company; Gold Bond Gypsolite.
      b. USG Corporation; Structo-Lite.
      c. Perlcon; Ready Mix Plaster
      d. Or approved equal.

C. Gypsum Neat Plaster: For use with job-mixed aggregates.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. National Gypsum Company; Gold Bond Two-Way Hardwall Plaster.
      b. USG Corporation; Red Top Gypsum Plaster.
      c. CertainTeed Corp; Saint-Gobain North America
      d. Or approved equal.

2.6. FINISH-COAT PLASTER MATERIALS

A. Gypsum Gauging Plaster: ASTM C 28/C 28M.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. National Gypsum Company; Gold Bond Two-Way Hardwall Plaster.
      b. USG Corporation; Red Top Gypsum Plaster.
      c. Champion Quality; White Gauging Plaster.
      d. Or approved equal.

B. Gypsum Ready-Mixed Finish Plaster: Manufacturer's standard, mill-mixed, gaged, interior finish.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. National Gypsum Company; Gold Bond Kal-Kote Smooth.
      b. USG Corporation; Diamond Brand Interior Finish Plaster.
      c. Weber Saint-Gobain; Weberwall Premium Plaster
      d. Or approved equal.

2.7 PLASTER MIXES

A. Mixing: Comply with ASTM C 842 and manufacturer's written instructions for applications indicated.

2.8 PERFORMANCE REQUIREMENTS

A. Where indicated on construction documents, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E119 by a qualified testing agency.
B. Where indicated on construction documents provide cement plaster assemblies identical to those of assemblies tested for STC ratings according to ASTM E90 and classified according to ASTM E413 by a qualified testing agency.

PART 3 - EXECUTION

3.1. EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2. EXAMINATION

A. Examine nonstructural and structural metal framing, substrates, and hollow-metal frames, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3. PREPARATION

A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

3.4. INSTALLING EXPANDED-METAL LATH

A. Expanded-Metal Lath: Install according to ASTM C 841.

1. Partition Framing and Vertical Furring: Install flat diamond-mesh lath.
2. Flat-Ceiling and Horizontal Framing: Install flat diamond-mesh lath.
3. Curved-Ceiling Framing: Install flat diamond-mesh lath.

3.5. INSTALLING ACCESSORIES

A. General: Install according to ASTM C 841.

B. Cornerbeads: Install at external corners.

C. Casing Beads: Install at terminations of plasterwork, except where plaster passes behind and is concealed by other work and where metal screeds, bases, or frames act as casing beads.

D. Control Joints: Install control joints at locations indicated on Drawings.

3.6. PLASTER APPLICATION

A. General: Comply with ASTM C 842.

1. Do not deviate more than plus or minus 1/8 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed on surface.
2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

B. Base Coats:

1. Base Coats over Expanded-Metal Lath:

a. Scratch Coat: Gypsum wood-fibered plaster; neat or with job-mixed sand.

b. Brown Coat: Gypsum lightweight ready-mixed plaster.

C. Finish Coats:

1. Finish-Coat Mix for Smooth-Troweled Finishes: Gypsum ready-mixed finish.

3.7. PLASTER RESTORATION

A. Restore or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.8. CLEANING AND PROTECTION

A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Restore floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION 09 23 00

SECTION 09 29 00 - GYPSUM BOARD

PART 1 GENERAL

1.1. RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2. SUMMARY

A. Work of this Section includes gypsum board and the following:

1. Gypsum board and related materials.
2. Metal trims and accessories.

B. Related Sections:

1. Section 06 10 00 “Rough Carpentry”.
2. Section 07 92 00 “Joint Sealants”.

1.3. SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4. SUBMITTALS

A. Product and System Data: Manufacturer's product literature, test reports and installation instructions.

B. Shop Drawings: Submit fabrication and assembly drawings indicating materials, piece quantities and dimensions, each piece surface finish, assembly configuration, erection sequence, piece numbering, specific attachments and attachment requirements.

1. Drawings for installed products indicated to comply with design loads, include structural analysis data signed and sealed by a professional engineer licensed in the State of New York responsible for their preparation.
2. Field Measurements: Take necessary field measurements prior to preparation of Shop Drawings.

a. Record measurements on Shop Drawings.

1.5. QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Source Limitations: Obtain light gage metal framing through one source from a single manufacturer.

C. Pre-installation Meeting: Purpose is to review installation procedures and warranty requirements.

1.6. DELIVERY, STORAGE, AND HANDLING

A. Deliver all manufactured materials to site in original packages, containers, or bundles bearing the manufacturer's name and brand names, type of material, and contents.

B. Store materials in interior spaces, above floors, under cover, away from sweating walls and other damp surfaces, and with good ventilation.

C. Handle gypsum boards to prevent damage to edges, ends, or surfaces. Protect metal corner beads, casing beads, and trim from being bent or damaged.

1.7. WARRANTY

A. Warranty: Furnish with a two (2) year written warranty signed by the manufacturer agreeing to repair or replace work which has failed as a result of defects in materials. Upon notification within the warranty period, such defects will be restored at no additional cost to the City of New York.

PART 2 - PRODUCTS

2.1. GYPSUM BOARD

A. Gypsum Board: ASTM C1396:

1. Provide Type C boards of thickness and size as indicated
    a. Size: 5/8 inch by 48 inches wide by length required to minimize cross joints
2. Regular: Tapered-edge gypsum panels.
    a. Provide Type X gypsum panels at fire-rated assemblies, or where noted on Drawings.
3. Foil-Backed Boards: Furnish continuously where noted to provide vapor retarder.
4. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold- resistant core and paper surfaces.
    a. Core: 5/8 inch, Type X.
    b. Long Edges: Tapered.
    c. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
5. ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
    a. Basis-of-Design Product: Subject to compliance with requirements, provide-USG Exterior Sheetrock or comparable product by one of the following:
        1) Certainteed; Exterior Soffit Board
        2) Goldbond; XP Gypsum Board
        3) Or approved equal.

b. Thickness and Type: 5/8 inch, Type X.

6. Cementitious Backer Units (CBU): ANSI A118.9, backer board composed of stable portland cement, aggregates, and reinforcements with ability to remain unaffected by prolonged exposure to moisture.

2.2. FASTENERS

A. Self-drilling screws conforming to ASTM C1002, of type indicated for substrate, provide lengths recommended by manufacturer.

1. Gypsum Wallboard to Steel Framing and Furring Members: Type S, bugle head screws with bugle- type Phillips-head.
2. Gypsum Wallboard to Wood Blocking: Type W with bugle-type Phillips-head.
3. Steel Framing and Furring Members to Other Steel Members: Type S, pan head screws.
4. Tile Backing Panels: Use corrosion-resistant screws of type and size recommended by panel manufacturer.

2.3. METAL TRIM AND ACCESSORIES

A. General: Provide metal trim and accessories conforming to ASTM C840. Unless otherwise indicated, provide paper-faced trim and accessories.

B. Corner Bead: 1 inch by 1 inch perforated flange, standard type, 26 gauge, galvanized steel, for compound finishing.

2.4. FINISHING MATERIALS

A. Joint Treatment Materials: Joint treatment materials will conform to ASTM C474 and ASTM C475, as applicable.

1. Laminating Adhesive and Joint Finishing Compound: As recommended by gypsum wallboard manufacturer, interior type for interior general use, exterior type for use at water resistant gypsum backer board.
2. Joint Tape: 2 inches to 2-1/2 inches wide paper tape, as recommended by gypsum wallboard manufacturer.

B. Exterior Joint Finishing Compound: Setting-type compound, as recommended by manufacturer.

1. Exterior Soffit Tape: 2" wide, 10 x 10 woven threads per inch self-adhering fiberglass joint tape.

2.5 PERFORMANCE REQUIREMENTS

A. Where indicated on construction documents, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E119 by a qualified testing agency.

B. Where indicated on construction documents provide cement plaster assemblies identical to those of assemblies tested for STC ratings according to ASTM E90 and classified according to ASTM E413 by a qualified testing agency.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Inspect job conditions and related Work and report to Commissioner in writing, all conditions interfering with the proper installation of Work of this Section. Commencement of Work in any given area will constitute acceptance of conditions in that area as acceptable to receive Work of this Section.

3.3 GENERAL REQUIREMENTS

A. Provide Work conforming to published specifications and installation instructions of each manufacturer, the approved shop drawings, above-referenced quality assurance standards and the New York City Building Code.

B. Erect gypsum drywall Work, rigidly supported, and securely fastened in place, in such a manner that plumb, level, and true finished lines and surfaces will result in the finished Work in accordance with the requirements of ASTM C754 and ASTM C840.

C. Construct gypsum drywall Work only after all windows and door openings are enclosed and a temperature of not less than 55 Deg F is maintained during and up to completion of the drywall Work.

3.4 GYPSUM BOARD AND RELATED MATERIALS INSTALLATION

A. Examination:

2. Verify that framing and furring are securely attached and of sizes and spacing to provide a suitable substrate to receive gypsum board and cementitious backer units.
3. Proceed with Work only after framing and furring are acceptable for application of gypsum board and cementitious backer units.

B. Gypsum Wall Board: Install according to the most current versions of Gypsum Association Publication GA-216-2004 “Application and Finishing of Gypsum Panel Products” and ASTM C840, “Standard Specification for Application and Finishing of Gypsum Board for Non-Fire Rated Construction.”

C. Gypsum Base Installation: Unless otherwise indicated application of gypsum base will conform to ASTM C844.

3.5 FINISHING OF GYPSUM BOARD

A. Tape and finish gypsum board in accordance with ASTM C840 and GA-214:

B. Provide joint, fastener depression, and corner treatment.

C. Tool joints as smoothly as possible to minimize sanding and dust.

D. Protect workers, building occupants, and HVAC systems from gypsum dust.

E. Finish each concealed joint in wallboard above ceiling finishes flush with tape and a minimum of two coats of compound to provide a continuous, uninterrupted plane for acoustical and fire-resistive performance. Concealed joints may be left in rough condition without finish sanding.

F. Apply gypsum board finish in accordance with manufacturer's published instructions and GA-214 Finish Levels.

1. Level 0 for concealed surfaces which are not fire rated, smoke barriers, or plenums.
2. Level 1 for concealed surfaces which are fire rated, smoke barriers, or plenums.
3. Level 2 under ceramic tile finish.
4. Level 3 within mechanical rooms, machine rooms, electrical rooms, and non-occupied areas.
5. Level 4: Finish for all finished spaces.
6. Level 5: Not used.

3.6 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish and other discarded materials from Project site.

B. Protect the work of other trades and work of this Section already installed against soiling and damage by the exercise of reasonable care and precautions. Restore or replace any work so damaged or soiled.

C. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

END OF SECTION 09 29 00

SECTION 09 91 00 - PAINTING

PART 1 GENERAL

1.1. RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2. SUMMARY

A. Work includes exterior and interior painting.

B. Related Sections:

1. Section 05 50 00 “Metal Fabrications”
2. Section 09 23 00 “Gypsum Plastering”
3. Section 09 29 00 “Gypsum Board”

1.3. SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4. SUBMITTALS

A. Product Data: Submit manufacturer's product data, paint analysis, application instructions, use limitations and recommendations for each material used. Provide certifications stating that materials comply with requirements and that paint products used are the highest quality produced by the manufacturer.

1. Initial Selection Samples: Submit color swatches showing complete range of colors and finishes available for each paint and finish system.

B. Verification Samples: Before painting mock-ups, submit representative samples of each material that is to be exposed in the finished work, showing the full range of color and finish variations expected. Provide samples having a minimum area of 144 square inches prior to brushout samples specified herein.

1.5. QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Source: For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer. Provide thinners and other secondary materials which are acceptable to the manufacturers of the primary materials.

C. Brushout Samples: Before beginning primary work of this section, provide 100 square feet mock-ups of each color and paint system at locations acceptable to Commissioner and obtain

Commissioner's acceptance of visual qualities. Protect and maintain acceptable mock-ups throughout the work of this section to serve as criteria for acceptance of this work.

D. Cooperate and provide samples of materials to be taken as they are used. The Contractor will pay all costs of tests which show failure to comply with Contract Documents.

1.6. DELIVERY, STORAGE AND HANDLING

A. Deliver materials and products in unopened factory labeled packages. Store and handle in strict compliance with manufacturers' instructions and recommendations. Protect from freezing and damage.

B. Avoid the possibility of fire by removing flammable materials, solvents, and spirits from the project site or by storing materials in UL approved fire-resistive cabinets. Keep work area free from flammable waste and soiled rags.

1. Sequence deliveries to avoid delays but minimize on-site storage.

1.7. PROJECT CONDITIONS

A. Weather, Temperature, and Humidity: Perform work only when existing and forecasted conditions are within the limits established by manufacturers of the materials and products used.

B. Indoor Temperature: Maintain minimum interior temperature of 65 degrees F during application and drying of paints and until occupancy of the building.

C. Outdoor Temperature and Conditions: Air and surface temperatures will be 50 degrees F or above and dry during finishing and drying. Test all surfaces with moisture meter before proceeding. Surfaces will be dry within the limitations of the finish system manufacturers.

D. Substrates: Proceed with work only when substrate construction and penetrating work is complete.

E. Ventilation: Comply with manufacturer's requirements and recommendations.

F. Lighting: Since lighting conditions can change the appearance of the work, work only when the permanent lighting system is operational and in use.

1.8. SEQUENCING AND SCHEDULING

A. Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

B. Coordinate this work with work specified in other sections. Furnish information on finish materials to be used in the field to ensure that correct prime coats are used in the shop.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Benjamin Moore
2. Sherwin Williams.
3. PPG Industries.
4. Or approved equal.

B. Provide secondary products as recommended by manufacturer of primary products.

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another, and substrates indicated, under conditions of service and application indicated.

C. VOC Content: Provide materials that comply with VOC limits required by the New York City Building Code, and as follows:

1. Products must meet or exceed the VOC and chemical component limits of Green Seal requirements as follows:

a. Interior Coatings:

1) Non-flat: 150
2) Flat: 50

2.3. EQUIPMENT

A. Painting Equipment: to best trade standards for type of product and application.

B. Spray-Painting Equipment: of ample capacity, suited to the type and consistency of paint or coating being applied and kept clean and in good working order at all times.

2.4. MIXING AND TINTING

A. Unless otherwise specified or pre-approved, all paints will be ready-mixed and pre-tinted. Re-mix all paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and color and gloss uniformity.

B. Paste, powder, or catalyzed paint mixes will be mixed in strict accordance with manufacturer's written instructions.

C. Where thinner is used, addition will not exceed paint manufacturer's recommendations.

D. If required, thin paint for spraying in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Commissioner.

2.5. FINISH AND COLORS

A. Unless otherwise specified herein, all painting work will be in accordance with MPI Premium Grade finish requirements.

B. Colors will be as selected by the Commissioner from a provided manufacturer's full range of colors. Refer to Finish Schedule for identification and location of colors.

2.6. PERFORMANCE REQUIREMENTS

A. Paints will be fit for purpose and manufactured specifically for the applications indicated an uses intended, taking into account the type, nature, location, and aesthetic and utility requirements of the project.

1. Opacity: paint will cover or hide the substrate to the Commissioner’s satisfaction.
2. Cleanability: Paint will not absorb dirt and will be capable of being washed or scrubbed periodically, to the Commissioner’s satisfaction, without adverse effect on its attributes or appearance.

B. Scrub Resistance wet and dry: paint will resist abrasion caused by scrubbing in accordance with ASTM D 2486.

C. Adhesion: Paints will be manufactured BS 6150, to relevant US standards, or any other international standard approved by the Commissioner.

D. Color Differentiation: Contractor will supply decorative colors to the references that are scheduled or otherwise instructed by the Commissioner and to conform to BS 4800 or BS 381C or other color referencing systems only when specifically indicated on the drawings or specification.

PART 3 - EXECUTION

3.1. EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2. EXAMINATION

A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.

1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

B. Coordination of Work: Coordinate primers with total system compatibility for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify the Commissioner about anticipated problems using the materials specified over substrates primed by other trades.

3.3. PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is

impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.
2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber- reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
    a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
    b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's written instructions.
3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
    a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
    c. When transparent finish is required, back prime with spar varnish.
    d. Back prime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
    e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.
    a. Clean steel surfaces. Clean as recommended by paint system manufacturer and according to requirements of SSPC-SP series.
    b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.

c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.

5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film before using.
3. Use only thinners approved by paint manufacturers and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.4. APPLICATION

A. Apply paint or stain in accordance with MPI Painting Manual Premium Grade finish requirements.

B. Painting coats specified are intended to cover surfaces satisfactorily when applied at proper consistency and in accordance with manufacturer’s recommendations.

C. Tint each coat of paint progressively lighter to enable confirmation of number of coats.

D. Apply a minimum of four coats of paint where deep or bright colors are used to achieve satisfactory results.

E. Sand and dust between each coat to provide an anchor for the next coat and to remove defects visible from a distance up to 1000mm.

3.5. CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6. EXTERIOR FINISH / COATING SYSTEMS

A. Paint exterior surfaces in accordance with the following MPI Painting Manual requirements:

1. Steel Substrates:

a. Water-Based Light Industrial Coating System:

1) Prime Coat: Shop primer compatible with specified substrate.
2) Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
3) Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5), MPI #163.

2. Galvanized-Metal Substrates:

a. Water-Based Light Industrial Coating System:

1) Prime Coat: Primer, galvanized metal, compatible with topcoat and for exterior use on galvanized-metal substrates.
2) Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
3) Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5), MPI #163.

3.7. INTERIOR FINISH / COATING SYSTEMS

A. Concrete Ceilings: 2 coats

1. Basis-of-Design Product: Subject to compliance with requirements, provide Benjamin Moore Coronado Super Kote 5000 Dry Fall Latex Flat N110 or comparable product by one of the following:

a. Sherwin Williams.
b. PPG Paints.
c. Or approved equal.

B. GWB/Plaster Ceilings: 2 finish coats over primer:

1. Primer

a. Basis-of-Design Product: Subject to compliance with requirements, provide Benjamin Moore Ultra Spec 500 Latex Primer N534 or comparable product by one of the following:

1) Sherwin Williams.
2) PPG Paints.
3) Or approved equal.

2. Finish Coats

a. Basis-of-Design Product: Subject to compliance with requirements, provide of Benjamin Moore Waterborne Ceiling Paint 508 or comparable product by one of the following:

1) Sherwin Williams.
2) PPG Paints.
3) Or approved equal.

C. GWB/Plaster Walls: 2 finish coats over primer:

1. Primer

a. Basis-of-Design Product: Subject to compliance with requirements, provide Benjamin Moore Ultra Spec 500 Latex Primer N534 or comparable product by one of the following:

1) Sherwin Williams.
2) PPG Paints.
3) Or approved equal.

2. Finish Coats

a. Basis-of-Design Product: Subject to compliance with requirements, provide Benjamin Moore Ultra Spec 500 in required sheens or comparable product by one of the following:

1) Sherwin Williams.
2) PPG Paints.
3) Or approved equal.

D. Metal Railings: 2 finish coats over primer:

1. Primer

a. Basis-of-Design Product: Subject to compliance with requirements, provide Benjamin Moore Ultra Spec HP04 Acrylic Metal Primer or comparable product by one of the following:

1) Sherwin Williams.
2) PPG Paints.
3) Or approved equal.

2. Finish Coats

a. Basis-of-Design Product: Subject to compliance with requirements, provide Benjamin Moore Ultra Spec HP D.T.M Acrylic Enamel or comparable product by one of the following:

1) Sherwin Williams.
2) PPG Paints.
3) Or approved equal.

E. CMU: 2 finish coats over primer:

1. Primer

a. Basis-of-Design Product: Subject to compliance with requirements, provide 1 coat Benjamin Moore Ultra Spec High Build Block Filler 571 or comparable product by one of the following:

1) Sherwin Williams.
2) PPG Paints.
3) Or approved equal.

2. Finish Coats

a. Basis-of-Design Product: Subject to compliance with requirements, provide 2 coats Benjamin Moore Ultra Spec 500 Interior Semi-Gloss N539 or comparable product by one of the following:

1) Sherwin Williams.
2) PPG Paints.
3) Or approved equal.

F. Exposed Ductwork, Conduit: 2 coats.

1. Finish Coats

a. Basis-of-Design Product: Subject to compliance with requirements, provide Benjamin Moore Coronado Super Kote 5000 Dry Fall Latex Flat N110 or comparable product by one of the following:

1) Sherwin Williams.
2) PPG Paints.
3) Or approved equal.

END OF SECTION 09 91 00

SECTION 22 00 00 – 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 of the specifications requires the furnishing and installation of all items, including every article, device, or accessory reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to, materials, labor, supervision, supplies, equipment, transportation, rigging, storage, utilities, and all required permits and licenses.

1.3 REFERENCE STANDARDS

A. Refer to DDC General Conditions Section 01 42 00 "References".

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

1.5 ENGINEERING REFERENCE POINTS

A. The Subcontractor must provide benchmarks, monuments, and other reference points on the job that will be available for this Subcontractor's use.

B. Maintain all existing benchmarks, monuments, and other reference points and perform all field engineering required to ensure that work under this section must conform with grades, elevations, and lines required.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.7 SUBMITTALS

A. Samples must be identical in all respects to the material which is to be installed or applied in the execution of the work and must be of sufficient size or quantity to permit proper evaluation and review. Manufacturer's descriptive labels and printed application instructions which are normally

attached to the material or its packaging must be furnished with the sample. Samples must be submitted for review when requested by the Commissioner.

B. Submit names, sizes, catalog numbers and/or samples of the following materials for approval:

1. Fittings
2. Roof Drains
3. Hangers
4. Insulation
5. Pipe
6. Sleeves and Escutcheons

1.8 MANUFACTURERS' REQUIREMENTS

A. With the exceptions as specified and/or indicated on the drawings or in the specifications, the Subcontractor must apply, install, connect, erect, use, clean, test 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.

B. Where the manufacturer's recommendations conflict with the Contract Documents, the conflict must be brought to the Commissioner's attention immediately.

1.9 SPACE LIMITATIONS

A. 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 and proper fit rests with the Subcontractor.

B. Physical dimensions and arrangements of equipment to be installed must be subject to the Commissioner's review.

C. Coordinate the installation of piping and equipment with lighting fixtures, special ceiling construction, air distribution equipment and the structure. Provide additional risers, drops and offsets as required. If, after installation, new piping or equipment is found to conflict with the architecture, structure, or other trade work which is either existing or shown on the Contract Documents, the piping or equipment must be relocated without additional cost to the City of New York.

D. The Subcontractor 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 and, where space conditions appear inadequate, the Commissioner must be notified before proceeding with the installation.

1.10 ELECTRICAL EQUIPMENT AND ELECTRICAL ROOM PRECAUTIONS

A. The Subcontractor must not install piping or equipment in any electrical equipment room unless this piping or equipment serves only these rooms. Installation is strictly prohibited where it violates the requirements of the NYC Electrical Code.

B. No piping or other equipment foreign to the electrical installation must be installed within the dedicated zone above switchboards, panelboards, distribution boards, and motor control centers to a height of 6 ft. above the equipment or the structural ceiling, whichever is lower. The area above the dedicated space must be permitted to contain foreign systems, provided protection is installed to avoid damage to the electrical equipment from condensation, leaks or breaks in such foreign systems.

C. Caution workers both verbally and in writing as to the dangers involved in doing work adjacent to electrical equipment within electrical closets, Mechanical Rooms, Switchgear Rooms and Elevator Machine Rooms, due to dangers caused by the presence of high voltages and currents in these spaces.

D. Provide all necessary personal protective equipment meeting OSHA requirements when working in areas within live electrical equipment.

1.11 CUTTING AND PATCHING

A. In general, cutting and patching will be done under other divisions of the specifications.

B. Furnish to the Subcontractor 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.

C. Set drains and sleeves for pipes accurately before concrete floors are poured, or set boxes on the forms to leave openings in the floors and subsequently set required sleeves in the openings.

D. Should the Subcontractor neglect to perform preliminary work, and should cutting be required in order to install equipment, the expense of this cutting and restoring of surfaces to their original condition must be borne by this Contractor.

1.12 PROTECTION OF EQUIPMENT AND MATERIALS

A. Protect from damage, water, dust all material and equipment provided under this division, both in storage and installed in accordance with manufacturer’s requirements until substantial completion has been filed and accepted.

B. Arrange with the Subcontractor for storage facilities for materials and equipment.

C. All products stored off-site and delivered to the site must be kept in factory packing with positioning devices in place until installation. Equipment that is subject to damage from moisture must be stored indoors in a suitably controlled environment with factory covering in place.

D. Material, equipment or apparatus damaged because of improper storage or protection must be rejected.

E. Protect equipment from damage due to moisture, water, spray-on fireproofing, and construction debris during construction.

F. Cover and protect all openings left in floor for passage of pipes. Protect pipes with suitable coverings as soon as set. Close all open ends of pipes with a plug fitting and conduits with caps to prevent obstruction and damage.

G. Protect the system against freezing in cold weather.

H. Prior to starting equipment, remove all protective materials, shipping bars, retainers, positioning devices.

1.13 CONSTRUCTION REVIEW

A. Work may be reviewed at any time by the Commissioner.

B. Advise the Commissioner that work is ready for review at the following times:

1. Prior to backfilling buried work.
2. Prior to concealment of work in walls and above ceilings.
3. Testing of systems and equipment.
4. When all requirements of the Contract have been completed.

1.14 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. To this end, both the balancing of rotating machinery and the installation of vibration isolation at various locations are required.

C. It must be the responsibility of this Subcontractor to obtain equipment that is quiet in operation as compared to other available equipment of its size, capacity, and type; to install equipment so that a minimum amount of noise and/or vibration is transmitted to the building; and to fabricate the piping systems so that noises generated in the systems are held to an absolute minimum.

D. Any additional precautions deemed necessary to provide a quiet installation must be done as part of the work of this division, 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 Subcontractor to make any changes to equipment or work installed that may be required to provide systems that are quiet in operation and comply with the acoustic requirements as specified herein.

E. Except in various special areas listed herein, the system noise level, in occupied spaces, must be equal to or less than the "lowest value in the range" of the noise criteria curves for the particular space in accordance with the current edition of Applications Volume of the ASHRAE Handbook. The noise criteria curves must be based on ANSI Standard S1.6-1984 (R-1990) octave bands and a sound pressure level in decibels referenced to 0.002 microbars. Sound levels within the occupied spaces must meet the criteria described above and with all building, wall partition, floor, ceiling plenum depth, and ceiling construction in place as they exist for the individual spaces. The attenuation through boundary construction of Equipment Rooms must be considered in selecting equipment for acceptable noise level as described herein.

1.15 COORDINATION

A. At a time, designated, the entire installation must be reviewed for compliance with the Contract Drawings and specifications. The Subcontractor must be available at all times during this Review.

B. The Subcontractor must demonstrate prior to the Final Review that all systems and all equipment have been properly balanced and adjusted and are in compliance with the requirements of the Contract Documents. After these demonstration tests are completed satisfactorily, but prior to the Final Review field visit by the Commissioner, the Subcontractor must submit to the Commissioner a written certification that attests to Contract Document compliance for this Project.

C. Certificates and documents required herein must be in order and presented to the Commissioner at least two (2) weeks prior to the Final Review.

D. After the Final Review, any changes or corrections noted as necessary for the work to comply with these specifications and the drawings must be accomplished without delay in order to secure substantial completion of the work.

1.16 DATE OF COMPLETION AND TESTING OF SYSTEMS

A. The date for the final performance and acceptance testing must comply with the project construction schedule and must be sufficiently in advance of the Contract completion date to permit the execution of the testing by the Subcontractor prior to occupancy and the close-out of the Contract. Any adjustments and/or alterations which the substantial completion tests indicate as necessary for the proper and satisfactory functioning of all equipment and systems must be completed prior to the close-out of the Contract. Re-tests must not relieve the Subcontractor of substantial completion date responsibility.

B. The Subcontractor must provide a detailed schedule of completion indicating when each system component and entire system is to be completed and outlining when tests will be performed. The

completion schedule must be submitted to the Commissioner for review. This schedule must be updated periodically by the Subcontractor as the project progresses. Each update must be submitted to the Commissioner and the City of New York for review.

1.17 DEMONSTRATION

A. The Subcontractor must provide the services of a factory-trained specialist to supervise the startup, and operation of all equipment specified herein and to instruct the City of New York's operators during a five (5) day 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 and must include a period for videotaping of the operating instructions. See individual sections of these specifications for additional instructions by manufacturer-trained specialists.

B. The Commissioner must be notified in writing at least two (2) weeks before each operating instruction period begins. The Subcontractor must commence no instruction period until the Commissioner has issued written acceptance of the starting time.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Condition for execution requirements.

3.2 GENERAL

A. Installation must be in accordance with the specification section pertaining to the individual equipment and system piping.

END OF SECTION 22 00 00

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. This Section includes:

1. Sleeves.
2. Access doors.
3. Escutcheons.

1.3 REFERENCES

A. Refer to DDC General Conditions Section 01 42 00 “References”.

1.4 WORK INCLUDED

A. The work includes, but is not limited to, the following systems, equipment and services:
1. Storm drains piping.
2. Roof drains.
3. Vent piping.
4. Provide all miscellaneous support for Division 22 work and equipment.
5. Furnishing of shop drawings, product data and samples.
6. Furnishing of “Record Drawings”.
7. Furnishing of Subcontractor “Coordination Drawings”.
8. Miscellaneous items as required for complete and functioning systems as specified herein.
9. All systems, equipment, and services specified herein must be furnished and installed completely and ready for use.
10. Provide all sleeves for the Plumbing work complete with seals and firestop.
11. Patching or replacement of all fireproofing if it is damaged or removed during the installation of the plumbing work.
12. Participate in and assist in the operation of the fire safety ventilation equipment as required during the performance testing and startup of the fire detection, alarm and communication systems.
13. Instruments as required for operating and testing the various systems must be furnished and installed completely as specified herein.
14. Hydrostatic testing, operational testing and adjusting of all systems.

1.5 FACTORY TESTING

A. All mechanical sleeve seals and access doors must be fully assembled, and factory tested for full functionality at the manufacturer's factory prior to shipment.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.7 SUBMITTAL

A. Product Data: For each type of product indicated. Manufacturer’s technical and installation literature for all material specified or proposed in this Section for use on the project.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the requirements, provide products by one of the following:

1. Access Doors

a. Karp Associates, Inc.
b. Milcor
c. Williams Brothers Corp.
d. Or approved equal

2. Escutcheons

a. Chicago Specialty.
b. Producers Specialty.
c. Sanitary-Dash.
d. Or approved equal

3. Sleeves

a. Calpico, Inc..
b. Metraflex. Co.
c. Pipeline Seal & Insulator Inc.
d. Or approved equal

2.2 COMPONENTS

A. All materials and equipment must be new, in good condition and free from defect. The commercially standard items of equipment and the specific names mentioned herein are intended to identify standards of quality and performance necessary for the proper functioning of the work.

B. Since manufacturing methods vary, reasonable minor variations are expected; however, performance and material requirements specified herein are the minimum standards acceptable.

C. Materials and equipment which are found to have factory defects must be replaced or repaired in a manner acceptable to the Commissioner at no additional cost to the City of New York. The Subcontractor must be responsible for all costs associated with testing, replacement, or repair, including but not limited to, all replacement or repair costs, preparations prior to testing and all testing costs.

2.3 SLEEVES

A. Furnish sleeves for all pipes passing through floors, walls and concrete, or concrete fireproofed beams.

B. Sleeves in concrete beams, through concrete walls, and exposed pipes penetrating floors: Schedule 40 steel pipe.

C. Provide sleeves in foundation walls and in concrete pits with anchor flange.

D. Sleeves within furred-out enclosures in floors, through partitions, steel beams and walls: 18 gauge (1.2 mm) thick galvanized steel.

2.4 ESCUTCHEONS

A. Provide escutcheons as required to sufficiently enclose penetrations in fire and smoke rated walls and partitions in accordance with the Contract Documents.

B. Where pipes penetrate fire or smoke rated walls provide metal escutcheons on both sides of the wall penetration.

C. Escutcheons must be either one-piece or two-piece construction, chrome-plated brass or stainless steel.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Accept all materials and equipment in factory packaging and examine for visible damage. All damaged material and equipment must be removed from the job site and returned to the manufacturer for replacement.

3.3 INSTALLATION

A. Installation must be in accordance with the specification section pertaining to the individual equipment.

B. The arrangement, positions and connections of pipes, fixtures, drains, and the like, indicated on the drawings must be followed as closely as possible, but the right is reserved by the Commissioner to change locations and elevations to accommodate conditions which may arise during the progress of the work, prior to installation, without additional compensation for such changes. The responsibility for accurately laying out the work and coordinating the installation with other trades rests with this Subcontractor. Should it be found that any work is laid out so that interferences will occur, report that to the Commissioner before commencing work.

C. Carry fixture connections, concealed in building construction, to points above floor, break out close to the underside or adjacent to the fixture and continue exposed to fixture.

D. Piping Installation
1. Install pipes approximately as shown on the drawings and as directed during installation, as straight and direct as possible, forming right angles or parallel lines with building walls and other pipes, and neatly spaced. Erect pipe risers plumb and true, and parallel with walls and other pipes and neatly spaced.
2. Keep all horizontal runs of piping, except where concealed in partitions, as high as possible and close to walls. Maintain minimum 1/8-inch fall per foot on leader lines.
3. Do not install pipes in a manner which interferes with the full swing of the doors.
4. Ream all pipes smoothly before installation. Do not bend, flatten, split or otherwise injure the pipe.
5. Use reducing fittings, unless otherwise approved in special cases, in making reduction in size of pipe. Bushing is not allowed unless specifically approved.

E. Sleeves
1. Set sleeves in position in forms. Provide reinforcing around sleeves.
2. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
3. Extend sleeves through floors 2 in. (50 mm) above finished floor level. Caulk sleeves tight.
4. Where piping penetrates the floor, ceiling or wall, close off space between pipe and adjacent work with fire stopping and caulk airtight. Provide close-fitting metal collar or escutcheon covers at both sides of penetration.
5. Sleeves passing through fire-rated floors or walls must be sealed with an intumescent formulation.
6. Install chrome-plated steel escutcheons at finished surfaces.
7. Set sleeves as construction progresses and secure in place during the pouring of concrete.
8. Fire stopping must be installed as specified.

F. Escutcheons
1. Provide pipe escutcheons with inside diameter closely fitting pipe outside diameter, or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, or ceilings, and pipe sleeve extensions, if any. Furnish pipe escutcheons with chrome finish for occupied areas, prime paint finish for unoccupied areas.
2. Escutcheons for waterproof floors, and areas where water and condensation can be expected to accumulate must be stainless steel or chrome plated cast brass, solid or split hinged.
3. Escutcheons for dry areas must be chrome plated cast brass or galvanized sheet steel, solid or split hinged.

3.4 CLEANING

A. Before final connections are made and before operation of equipment and piping, thoroughly blow out, rod out, or wash out all piping at least twice, in a manner as directed and/or approved by the Commissioner, to remove all accumulation of dirt, chips or other deleterious material. Make all temporary connections and furnish all appliances required for the purpose of cleaning at no additional charge to the City of New York.

3.5 PROTECTIVE PAINTING

A. Painting, except as specified herein or indicated otherwise, must be done under another division. This division must cooperate with the other divisions to determine the size of equipment, sizes, and lengths of pipes, etc., to be painted.

3.6 FIELD TESTS

A. Notify the Commissioner and Inspectors at least 48 hours in advance of performing the required tests, so that arrangements may be made for their presence to witness the tests.

B. Furnish and pay for all devices, materials, supplies, labor and power required in connection with tests. Make all tests in the presence and to the satisfaction of the Commissioner, plumbing and other inspectors, and Public Utilities Inspectors.

C. Repair or, if required by the Commissioner, replace defective work with new work without additional cost to the City of New York. Repeat tests as directed, until all work is proven satisfactory.

D. Restore to its original condition any work damaged or disturbed by tests, engaging the original trades to do the work of restoration.

E. Test the systems before any paint or insulation is applied.

F. Performance Tests
1. Gravity Drainage Systems: Subject storm drains inside the building to a standing water test. The standing water test must include the entire system from the lowest to the highest point of the system. The system must be tested to a hydrostatic pressure equivalent to at

least a ten-foot head of water. After filling, shut off the water supply and allow it to stand two (2) consecutive hours, with no leakage.

G. Substantial completion
   1. Prior to substantial completion the Subcontractor must submit all performance test reports for each test performed. The reports must be bound in a three-ring binder and submitted to the Commissioner for review.
   2. Substantial completion testing must comply with the project construction schedule and must be sufficiently in advance of the Contract completion date to permit the execution of the testing by the Subcontractor prior to occupancy and the close-out of the Contract.
   3. Any adjustments and/or alterations which the substantial completion tests indicate as necessary for the proper and satisfactory functioning of all equipment and systems must be completed prior to the close-out of the Contract. Re-tests must not relieve the Subcontractor of completion date responsibility.

END OF SECTION 22 05 00

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. Provide all hangers, supports and anchors required for piping as indicated on and in accordance with the requirements of the Contract Documents.

B. Section includes:
1. Pipe hangers and supports.
2. Attachments to structure.
3. Formed steel channel supports and accessories.

1.3 RELATED SECTIONS

A. The following specification sections apply to all work herein:

1.	Section 22 05 00	-	Common Work Results for Plumbing
2.	Section 22 07 19	-	Plumbing Insulation
3.	Section 22 14 13	-	Facility Storm Drainage Piping
4.	Section 22 14 26	-	Facility Storm Drains

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Manufacturer’s technical and installation literature for all material specified or proposed in this Section for use on the project.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.7 SPECIFIC REQUIREMENTS

A. Provide pipe hangers and supports of which materials, design, and manufacture comply with ANSI/MSS SP-58.

B. Select and apply pipe hangers and supports, complying with MSS SP-69.

C. Fabricate and install pipe hangers and supports complying with MSS SP-89.

D. Assume the responsibility for the proper transfer of the loads of the piping system to the structure. No additional cost to the City of New York should be expected for any corrective work during construction.

E. Support and hangers must be provided for all horizontal and vertical piping. The hanger design must conform to the ASA Code for Pressure Piping. Hangers must be kept outside of pipe insulation.

F. All bracket clamps and rod sizes indicated in these Specifications are minimum size only. The Plumbing Subcontractor must be responsible for structural integrity of all supports.

G. All horizontal cast iron pipes must be supported every five (5) feet and at each hub and/or "no-hub" clamping assembly. When a concentration of fittings occur, additional support must be installed consistent with good trade practices. "No-hub" system must be supported in accordance with Standard CISPI-310-78.

1.8 WARRANTY

A. Furnish a five (5) year manufacturer’s warranty for all pipe hangers and supports.

B. The warranty period must commence upon substantial completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structured Design: Engineer trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer licensed in the State of New York, using performance requirements and design criteria indicated.

B. Structural Performance: Hangers and supports for HVAC piping and equipment must withstand the effects of gravity loads and stresses within limits and under conditions indicated according to (ASCE/SEI 7).

C. Provide supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

D. Provide equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

2.2 MANUFACTURERS

A. Subject to compliance with the requirements, provide products by one of the following:
   1. Anchors and Inserts (Undercut Wedge Type)

      a. Hilti.
      b. MKT Fastening, LLC.
      c. Simpson StrongTie.

d. Or approved equal

2. Formed Steel Channel Supports

a. Anvil International.
b. Cooper B-Line.
c. Carpenter & Patterson.
d. Empire Industries, Inc.
e. Erico - Caddy.
f. Hilti.
g. National Pipe Hanger Corporation.
h. PHS Industries, Inc.
i. Piping Technology and Products.
j. Thomas & Betts - Kindorf.
k. Tolco Inc.
l. Or approved equal

3. Pipe Hangers, Supports and Guides

a. Anvil International.
b. Cooper - B-Line.
c. Carpenter & Patterson.
d. Empire Industries, Inc.
e. Erico - Caddy.
f. Hilti.
g. National Pipe Hanger Corporation.
h. PHS Industries, Inc.
i. Piping Technology and Products.
j. Thomas & Betts - Kindorf.
k. Tolco Inc.
l. Witch Co.
m. Or approved equal

2.3 GENERAL REQUIREMENTS

A. All materials and equipment must be new, in good condition and free from defect. The commercially standard items of equipment and the specific names mentioned herein are intended to identify standards of quality and performance necessary for the proper functioning of the work.

B. Since manufacturing methods vary, reasonable minor variations are expected; however, performance and material requirements specified herein are the minimum standards acceptable.

C. Materials and equipment which are found to have factory defects must be replaced or repaired in a manner acceptable to the Commissioner at no additional cost to the City of New York. The Subcontractor must be responsible for all costs associated with testing, replacement, or repair, including but not limited to, all replacement or repair costs, preparations prior to testing and all testing costs.

2.4 PIPE HANGERS AND SUPPORTS

A. Provide suitable and substantial hangers and support for all piping and equipment. Hangers and supports must be of the type, size and spacing specified or as required by NYC Plumbing Code.

B. Comply with maximum load ratings with consideration for allowable stresses prescribed by ASME B31.1 or MSS SP-58.

C. Pipe hangers, anchors, supports and guides must be manufactured, selected, fabricated and installed in accordance with MSS SP-58, MSS SP-69 and MSS SP-89.

D. Provide support, guides and anchors that do not transmit unacceptable vibration to building structure.

E. The support systems must provide for, and control, the free or intended movement of the piping, including its movement in relation to that of connected equipment.

F. Provide for vertical adjustments after installation of supported material, where feasible, to ensure pipe is at design elevation and slope.

G. Select hangers and supports to perform under all conditions of operation, allowing free expansion and contraction, and to prevent excessive stresses being introduced into piping system and connected equipment.

H. Anchorage must be provided to restrain drainage piping from axial movement. Piping sizes greater than 4 in. (100 mm), restraints must be provided for drain pipes at all changes in direction and at all changes in diameter greater than two (2) pipe sizes. Braces, blocks, rodding and other suitable methods as specified by the coupling manufacturer must be utilized.

I. Provide drawings indicating pipe loads, including method of suspension and hanger location, and submit them for approval prior to proceeding with installation. Provide all the supplementary steel required to support, guide and anchor piping within shafts, Mechanical Equipment Rooms and all the other floors.

J. Particular care must be taken to support all pipes in a manner approved by the Commissioner, including the providing of supplementary steel, if required.

K. Where insulation is provided, protect the insulation, the length of the sleeve with a galvanized 20-gauge shield (360 deg.).

L. Support vertical risers from the building construction by means of pipe clamps at every floor. Provide channels of approved sizes where pipe clamps are too short to connect to the building construction.

M. Provide additional support for all sanitary and storm house drain offsets consisting of riser clamps and threaded rod to anchor all fittings in the horizontal offset. This method of anchoring and support must be provided in addition to the sway bracing described in the paragraph above.

N. Finishes

1. Hangers, anchors, inserts, supports and guides (swivel ring, split ring, roller, wrought pipe clamp, or adjustable wrought clevis-type hangers, roller supports, floor stands, wall brackets, etc.) installed within the building must be hot dipped galvanized in accordance with ASTM A123 or stainless steel.
2. Strut channels installed indoors must be pre-galvanized in accordance with ASTM A653 SS Grade 33 G90.
3. Hangers, anchors, supports, guides and strut located outdoors must be hot dip galvanized after fabrication in accordance with ASTM A123 or stainless steel. All hanger hardware must be hot-dip galvanized or stainless steel. Zinc-plated hardware is not acceptable for outdoor or corrosive use.

O. Hangers
1. Pipes 2 in. (50 mm) and smaller must be supported with one of the following:

   a. Adjustable steel swivel ring (band type) hanger.
   b. Malleable iron split ring hanger.
   c. Adjustable steel clevis hanger.

2. Pipes 2-1/2 in. (63.5 mm) and larger must be supported with one of the following:

   a. Adjustable steel swivel ring (band type) hanger.
   b. Adjustable steel clevis hanger.

3. Insulated pipes must be supported adjustable steel clevis hangers and pre-insulated sheet metal insulation shields.

P. Trapeze Hangers
1. Must be constructed of one of the following:

   a. 12-gauge roll-formed 1-5/8 in. (40 mm) by 1-5/8 in. (40 mm) minimum structural steel channel.
   b. Two (2) structural steel channels secured together with 1/2 in. (12.5 mm) or 3/4 in. (20 mm) steel pipe sections.

2. Pipes must be secured to trapeze by one of the following methods:

   a. Uninsulated Pipe: 2-piece pipe straps with thermoplastic elastomeric liner sized for outside diameter of pipe.
   b. Insulated Pipe: 2-piece pipe straps sized for outside diameter of pipe and insulation using insulation shields.

Q. Floor and/or Roof Supports
1. Must be one of the following:

   a. Adjustable pipe saddles and nipples welded or screwed to steel base stands secured to floor or roof.
   b. Adjustable roller stands with base plates secured to floor or roof.

2. Pipes must be secured to supports by one of the following methods:

   a. Uninsulated Pipe: 2-piece pipe straps with thermoplastic elastomeric liner sized for outside diameter of pipe.
   b. Insulated Pipe: 2-piece pipe straps sized for outside diameter of pipe and insulation using insulation shields.

R. Accessories
   1. Pipe protection saddles must be formed from carbon steel, 1/8 in. (3 mm) minimum thickness, sized for insulation thickness.
   2. Preinsulated shields must be 180 degrees, 18-gauge minimum galvanized sheet metal, minimum 12 in. (305 mm) long, with high-density water-repellant insulation, foam glass or high-density polyisocyanurate inserts minimum thickness to match outside diameter of the insulated pipe.

2.5 ATTACHMENTS TO STRUCTURE

A. All piping must be carried by pipe hangers and supports attached to the building structure. All supports and restraints requiring connections to steel-plated building construction must be welded to steel plating.

B. Method of attachment to and the load imposed on building structures by hangers, anchors, supports, guides, and supplemental steel must be submitted for review.

C. In no case must hangers be supported by means of vertical expansion bolts.

D. Powder and power-actuated devices, grip nails, and/or expansion nails is not permitted.

E. Structural Steel Attachments
   1. Center-loaded beam clamps or welded beam attachments must be used where piping is to be suspended from building steel. Clamp must be forged steel or malleable iron with cross bolts sized as required to fit beams and selected on the basis of load configuration and load to be supported.
   2. Where allowed by the Commissioner, C-clamps with locknuts, cup point set screws and retaining straps must be used. Top flange C-clamps must be used when attaching a hanger rod to the top flange of structural shapes. Set screw torque must be in accordance with manufacturer's recommendation.

F. Concrete Inserts
   1. Cast-in-place continuous or spot concrete inserts must be used where applicable.
   2. Continuous inserts must be made of 12 gauge, ASTM A1011 SS Grade 33 structural quality carbon steel, complete with Styrofoam inserts and end caps with nail holes for attachment to forms. The continuous concrete insert must have a load rating of 2,000 lbs./ft. in concrete.
   3. Spot inserts must be constructed of one of the following:

      a. Malleable iron or pressed steel having a space for rods of all sizes. All inserts for pipes 3 in. (75 mm) and larger in size must be installed with a reinforcing rod 5/8

in. (16 mm) in diameter, run through a slot in the insert specifically provided for this purpose.

b. Internally threaded machined steel insert with large, flanged heads suitable for installation on wood forms and/or formed metal decking.

G. Mechanical Anchors (After Sets)

1. If any pipe has to be hung in a space where no inserts have been provided, drill a hole from below through concrete slabs, and provide a rod and hanger attached to an approved fishplate.
2. Mechanical anchors of the undercut type may be used in stone concrete slabs only. The carrying capacity and size of each mechanical anchor must be calculated on the basis of the spacing indicated in the hanger spacing table hereinbelow.
3. Undercut wedge anchors for pipes 6 in. (150 mm) and smaller must be undercut anchor. For pipes 8 in. (200 mm) and over, provide two (2) undercut or wedge-type anchors with the corresponding rods and hangers fastened to the slab as specified above with a 2 in. x 2 in. (50 mm x 50 mm) angle or uni-strut to support the piping. Anchors must not be smaller than 3/8 in. (10 mm.)
4. The rods on all hangers must be of adequate size to support the load, which they carry. The minimum size must be 3/8 in. (10 mm.)

2.6 FORMED STEEL CHANNEL SUPPORTS AND ACCESSORIES

A. Formed steel channel supports must be capable of withstanding the effects of loads and stresses within limits and under conditions specified in ANSI A14.3 and must comply with NFPA 13 requirements.

B. The channel must be made of minimum 12-gauge ASTM A570 Grade 33 steel electro-galvanized after fabrication. Channel sections may be formed by single or factory-welded multiple sections of any of the following:

1. 1-5/8 in. (41.25 mm) x 1-5/8 in. (41.25 mm) channel.
2. 2-7/16 in. (62 mm) x 1-5/8 in. (41.25 mm) channel.
3. 3-1/4 in. (82.5 mm) x 1-5/8 in. (41.25 mm) channel.

C. Grip/Lock nuts must be made of 3/8 in. (10 mm) thick case-hardened mild steel bars electro galvanized after fabrication.

D. All angle brackets connectors and washers must be made of 1/4 in. (6.35 mm) steel plate electro-galvanized after fabrication.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Accept all materials and equipment in factory packaging and examine for visible damage. All damaged material and equipment must be removed from the job site and replaced by the manufacturer.

3.3 INSTALLATION

A. Hanger, rods, supports and accessories must be installed in accordance with the manufacturer's recommendations and NYC Building Code.

B. Furnish and install all necessary support for equipment furnished under this section. To meet the varying conditions in each case, these supports must consist of pipe stands, steel angle or strap hangers, saddles, and brackets, as required for a complete installation.

C. All such supports must have substantial flanges bolted to floor construction; hangers must be supported from the framing as described above. Supports must be properly located with reference to any supporting pads, legs of the equipment carried and must be distributed as not to bring any undue strains to the equipment.

D. All hanger and support details must be submitted for review and approval.

E. Guarantee that the work, as installed under this section of the specifications, will not result in the transmission of objectionable noise or vibration to any occupied parts of the building, and take full responsibility for any necessary modifications of this equipment, or of the foundations and supports for the same, necessary to secure this result.

F. Follow manufacturer's recommended written instructions and torque values when tightening C-clamps to bottom beam flanges.

G. Proper care and ventilation should be given when welding galvanized components.

H. Clamps on Riser Piping
   1. Support independent of connected horizontal pipework using riser clamps and riser clamp lugs welded to riser.
   2. Bolt tightening torques must be to industry standards.
   3. Cast Iron Pipes: Install clamp below joint.
   4. Steel Pipes: Clamp is fitted preferably below coupling or welded pipe lug.
   5. Clamps on riser piping must maintain the insulation and vapor barrier as piping passes through the support.

I. Support from Structural Members: Where structural bearing does not exist or inserts are not in suitable locations, provide supplementary structural steel members.

J. Field welding of supports must be done by NYC licensed welders using qualified welding procedures.

K. Support cast iron bell and spigot and No-Hub pipe and fittings with a minimum of two (2) hangers per each length of pipe. The maximum hanger spacing must be in accordance with the

hanger spacing schedule herein below. Hangers must be installed on each side of joint. Where an excessive number of fittings are installed between hangers, provide additional hangers, channel supports or reinforcing as required. Securely anchor fittings to the building construction at changes of direction to eliminate all horizontal movement.

L. Horizontal piping must be supported in accordance with the following schedules:

SINGLE ROD SUPPORT - STEEL AND CAST IRON PIPE		
Pipe Size	**Maximum Hanger Spacing**	**Rod Size**
1 to 2 inches (25 mm to 50 mm)	10 feet 0 inches (3,048 mm)	3/8 inch (10 mm)
2-1/2 and 3 inches (63 mm to 75 mm)	12 feet 0 inches (3,658 mm)	1/2 inch (12.5 mm)
4 to 5 inches (100 mm to 125 mm)	12 feet 0 inches (3,658 mm)	5/8 inch (16 mm)
6 to 10 inches (150 mm to 250 mm)	12 feet 0 inches (3,658 mm)	3/4 inch (20 mm)
DOUBLE ROD SUPPORT		
Pipe Size	**Maximum Hanger Spacing**	**Rod Size**
6 to 8 inches (150 mm to 200 mm)	12 feet 0 inches (3,658 mm)	1/2 inch (12.5 mm)
10 to 12 inches (250 mm to 300 mm)	12 feet 0 inches (3,658 mm)	5/8 inch (16 mm)

M. Maximum hanger spacing may not be exceeded; however, actual installed spacing will depend on the location of structural framing and floor slab construction. Where building construction does not permit the above spacing, provide additional steel supports.

N. Install lock nuts at the bottom of all hanger rods.

O. Vertical pipe risers must be supported independently of connected horizontal piping. Support vertical risers from the building construction by means of pipe clamps, at every story height.

P. Where hangers cannot be supported from building framing, they may be supported from concrete inserts, subject to the approval of the Commissioner. Furnish, locate and set such inserts and make sure that such inserts are in place when the concrete is poured.

Q. Set all inserts for all pipes in ample time to allow the work of the other trades to be performed on scheduled time.

R. Smaller pipes may be suspended from cross-pieces of pipe or steel angles, which, in turn, must be hung from building concrete construction by means of rods and inserts. The intention is to provide supports which, in each case, must be amply strong and rigid for the load, but which must not weaken or unduly stress the building construction.

S. Provide approved roller supports, floor stands, wall brackets, etc., for all lines running near the floor or near walls, which can be properly supported or suspended by the floors or walls. Pipelines near walls may also be hung by hangers carried from approved wall brackets at a higher level than the pipe.

T. No piping must be hung from other piping or ductwork. In no case must hangers be supported by means of vertical expansion bolts.

U. Hangers for piping must support the pipe without piercing the insulation. Pre-insulated pipe shields must be used to protect the insulation on pipes. It is the intent that the insulation shields must bear only on the insulation, which is of such density that the insulation will not be compressed, crushed or deformed.

3.4 CLEANING

A. Before final adjustments are made and before operation of equipment, clean and remove all accumulation of dirt, chips or other deleterious material. Leave all hangers and supports in condition suitable for finish painting, before substantial completion. Touch up, repair or replace damaged products before Substantial Completion.

3.5 INSPECTION AND STARTUP SERVICE

A. Inspect each hanger, rod and support for piping and equipment for proper installation according to the manufacturer's instructions.

3.6 FIELD TESTS

A. Performance Test: All hanger and support devices and components must be tested in accordance with the latest applicable industry standards.

3.7 ADJUSTING AND BALANCING

A. Adjust all pipe hangers, miscellaneous supports and equipment supports to equalize load for the piping and equipment they carry and to ensure that rods are vertical under operating conditions.

B. Hangers at equipment must be adjusted to ensure that there are no loads imposed on the equipment by the piping connected to the equipment.

C. Hangers and Supports
1. Ensure that rod is vertical under operating conditions.
2. Equalize loads for all piping and equipment supports.

D. Adjustable Clevis
1. Tighten hanger load nut securely to ensure proper hanger performance.
2. Tighten upper nut after adjustment.

E. Beam Clamps: Tighten all set screws and lock nuts.

F. Riser Clamps
1. Ensure all riser clamps are securely resting on the concrete slab or kindorf after system is tested and pressurized.
2. Tighten the riser clamp nuts after vertical adjustments are made.

END OF SECTION 22 05 29

SECTION 22 07 19 - PLUMBING PIPING 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. Furnish and install all insulation required for piping and equipment as indicated on and in accordance with the requirements of the Contract Documents.

B. Section includes:

1. Accessories.
2. Adhesives and sealants.
3. Pipe insulation.

1.3 RELATED SECTIONS

A. The following specification sections apply to all work herein:

1.	Section 22 05 00	-	Common Work Results for Plumbing
2.	Section 22 05 29	-	Hangers and Supports for Plumbing Piping and Equipment
3.	Section 22 14 13	-	Facility Storm Drainage Piping
4.	Section 22 14 26	-	Facility Storm Drains

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”

1.7 WARRANTY

A. Furnish a one (1) year manufacturer's warranty for all insulation products.

B. The warranty period must commence upon substantial completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Insulation materials furnished must meet the minimum thickness requirements of ASHRAE Standard 90.1 - Energy Efficient Design of New Buildings.

B. All thermal and acoustical insulation jackets, facings, membrane, adhesives, mastics, coatings, and accessory materials must be tested in compliance with the latest versions of ASTM E-84, MSS SP-69, NFPA 255 and/or UL 723 procedures.

C. All materials must comply with the requirements of NFPA 90A and must be listed and labeled by Underwriters Laboratories, Inc. for a fire hazard classification, not to exceed the following:

1. Insulation installed indoors: Flame Spread 25, Smoke Developed 50.
2. Insulation installed outdoors: Flame Spread 75, Smoke Developed 150.

D. Materials and products required for work of this section must not contain asbestos, formaldehyde, lead, mercury or mercury compounds, polychlorinated biphenyls (PCB's) or other hazardous materials.

E. All insulation must contain a minimum of 50% post-consumer recycled material.

F. Products that come in contact with stainless steel must have a leachable chloride content of less than 50 parts per million (ppm) when tested according to ASTM C 871.

G. Insulation for fittings, valves, flanges, and accessories must maintain the same thermal conductivity as the adjacent pipe insulation.

2.2 MANUFACTURERS

A. Accessories: Subject to compliance with the requirements, provide products by one of the following:

1. Buckaroos, Inc.
2. Insul-Shield.
3. Pipe Shields, Inc.
4. Thermal Pipe Shields, Inc.
5. Value Engineered Products, Inc.
6. Or approved equal.

B. Adhesives and Sealants: Subject to compliance with the requirements, provide products by one of the following:

1. Benjamin Foster Company.
2. Centiva.
3. Duro Dyne.
4. Elgen.
5. ITW TACC.
6. Or approved equal

C. Equipment Insulation: Subject to compliance with the requirements, provide products by one of the following:

1. Certain Teed Corp.
2. Johns-Manville.
3. Knauf Insulation.
4. Owens-Corning.
5. Or approved equal

D. Pipe Insulation and PVC Covers: Subject to compliance with the requirements, provide products by one of the following:

1. Certain Teed Corp.
2. Johns-Manville (Zeston).
3. Knauf Insulation.
4. Owens-Corning.
5. Proto Corporation.
6. Speedline Corporation.
7. Or approved equal

2.3 GENERAL REQUIREMENTS

A. All materials and equipment must be new, in good condition and free from defects. The commercially standard items of equipment and the specific names mentioned herein are intended to identify standards of quality and performance necessary for the proper functioning of the work.

B. Since manufacturing methods vary, reasonable minor variations are expected; however, performance and material requirements specified herein are the minimum standards acceptable.

C. Materials and equipment which are found to have factory defects must be replaced or repaired in a manner acceptable to the Commissioner at no additional cost to the City of New York. The Subcontractor must be responsible for all costs associated with testing, replacement, or repair, including but not limited to, all replacement or repair costs, preparations prior to testing and all testing costs.

D. The rating for insulation with factory-applied jackets or facings must be on a composite basis of insulation, jacket or facing, and the adhesive used to adhere the jacket or facing to the insulation.

E. Shipping containers for insulation and accessory materials must be labeled to indicate conformance to the fire hazard classification.

F. All vapor barriers must be completely sealed against moisture penetration.

2.4 ACCESSORIES

A. Pipe protection saddles must be formed from carbon steel, 1/8 in. (3 mm) minimum thickness, sized for insulation thickness. Saddles for pipe sizes greater than 12 in. (305 mm) must have a center support rib.

B. Pre-insulated shields must be 180 degrees, 18-gauge minimum galvanized sheet metal with high-density water-repellant insulation, foam glass or high-density polyisocyanurate inserts minimum thickness to match the outside diameter of the insulated pipe.

C. Pre-insulated shields must be no less than the following lengths:

Pipe Size	**Shield Length**
3/4 in. to 2-1/2 in. (63.5 mm to 19 mm)	10 in. (254 mm)
3 in. to 6 in. (150 mm to 75 mm)	12 in. (305 mm)
8 in. to 10 in. (254 mm to 203 mm)	16 in. (405 mm)
12 in. (305 mm) and over	22 in. (555 mm)

2.5 ADHESIVES AND SEALANTS

A. Provide adhesives and sealants conforming to the requirements of ASTM C 916, ASTM E 84, and UL 273.

B. Adhesives and sealants must be listed and labeled by Underwriters Laboratories, Inc. for a fire hazard classification, not to exceed the following:

1. Flame Spread 25
2. Fuel Contribution 50
3. Smoke Developed 50

2.6 PIPE INSULATION

A. Pipe insulation must be molded fiberglass one-piece insulation with white Kraft, fiber glass reinforced, and aluminum foil laminated, All-Service Jacket (ASJ). Pipe insulation must be capable of continuous service at a pipe temperature of 450°F (232° C) without

oxidation or burnout of binders or the development of odors or smoke by any constituent of the material. Physical characteristics must be as follows:

1. Minimum Density: 4 lbs/cu.ft. (64 kg/cu.m).
2. Thermal Conductivity: 0.23 Btu-in./hr/ft2 /°F (0.033 W/m at 24°C).
3. Maximum Service Temperature: 850°F (454°C).
4. Jacket Vapor Permeability: 0.02 perms.
5. Jacket Puncture Resistance: 50 units (Beach).

B. Pipe fittings and valves must be insulated with pre-molded fiberglass sections and pre-molded thermoplastic covers for the sizes manufactured. For other types and sizes, fittings and valves must be insulated with radially mitered segments of pipe covering secured in place with 16-gauge copper-plated, annealed steel wire. Pre-molded (PVC) fitting covers must be suitable for the same service temperature as pipe insulation.

C. Install a vapor barrier on fittings, valves and flanges consisting of open weave glass cloth applied with BF 30-35 adhesive and finished with a flooding brush coat of the same adhesive.

D. Insulation exposed to weather must be provided with a weatherproof jacket of corrugated aluminum with a 3 in. lap that will shed water. Fittings, valves and flanges must be weatherproofed with a weatherproof mastic reinforced with a glass cloth membrane and further coated with mastic.

E. Insulation for piping systems must be furnished and installed in accordance with the following schedule:

Service	**Pipe Size**	**Temp**	**Thickness**
Horizontal Leader, (over conference rooms and private offices)	All	450°F (232°C)	1 in. (25 mm)
Horizontal Storm Drains (including vertical stub to roof drains, including the entire roof drain body and trim to the underside of building structure)	All	450°F (232°C)	1 in. (25 mm)
Piping (Subject to Freezing)	All	450°F (232°C)	2 in. (50 mm)

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Accept all materials and equipment in factory packaging and examine for visible damage. All damaged material and equipment must be removed from the job site and replaced by the manufacturer.

3.3 INSTALLATION

A. Installation of all insulation, pre-molded fiberglass insulation, and thermoplastic covers for fittings and the use of adhesives and sealants must be in accordance with the manufacturer's recommendations and the NYC Building Code and NYC Plumbing Code.

B. Before applying insulation, all surfaces must be free of dust, grease, and foreign matter. Insulation must not be applied to any piping and equipment until required pressure testing has been completed and the system approved for tightness.

C. Where a vapor seal must be maintained, insulation must be applied with a continuous, unbroken moisture and vapor retarder.

D. All pipe insulation must be continuous through walls, ceiling, and/or floor openings.

E. Install multiple layers of insulation with longitudinal and circumferential joints staggered.

F. Pipe Insulation

1. Pipe insulation sections must be firmly butted together at all joints with jacket laps and joint butt strips pulled tight and smooth. Longitudinal joints must have a minimum 2 in. (50 mm) overlap. But joint strips must be a minimum of 3 in. (75 mm) wide.

2. Insulation for fittings, valves, flanges, and accessories must maintain the same thermal conductivity as the adjacent pipe insulation.

3. Valves, expansion joints, and other specialties requiring periodic servicing or inspection must be insulated with factory fabricated removable and reusable covers.

4. Flanges must be insulated with built-up sleeves of pipe covering overlapping the adjacent pipe insulation.

5. Insulated piping exposed to weather in freezing climates, including fittings, flanges and valves, which are exposed to weather or freezing or called to be

weatherproofed or freeze-protected must be provided with an additional 2 in. (50 mm) of fiber glass insulation and must be covered with a 30 mil (0.8 mm) thick UV resistant thermoplastic jacket with solvent-welded seams or 16 mil (0.4 mm) embossed aluminum jacket with all seams caulked. The completed installation must form a completely monolithic system preventing the entrance of water.

G. Piping within mechanical equipment rooms, in addition to the insulation and jacket specified, all piping, including fittings, flanges and valves, must be covered with a 30 mil (0.8 mm) thick thermoplastic jacket.

3.4 CLEANING

A. Before final adjustments are made and before operation of equipment, clean and remove all accumulation of dirt, chips or other deleterious material. Leave all insulation in suitable condition, before substantial completion.

B. Touch-up, repair, or replace damaged insulation, insulation jackets and vapor barriers before substantial completion.

3.5 ADJUSTING AND BALANCING

A. Upon completion of insulation, hangers for piping, and supports for equipment must be adjusted to ensure that the loads are distributed evenly and that there are no loads imposed by the piping and equipment on the insulation that it is provided with.

END OF SECTION 22 07 19

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. The work of this Contract includes the providing of all labor, materials, accessories, services and tests necessary to install, complete and make ready for operation by the City of New York, all work as shown on the Drawings and as specified herein.

B. Section includes:

1. Material of piping systems.
2. Pipe joints and fittings.
3. Specialty pipe fittings.
4. System material schedule.

1.3 RELATED SECTIONS

A. The following specification sections apply to all work herein:

1.	Section 22 05 00	-	Common Work Results for Plumbing
2.	Section 22 05 29	-	Hangers and Supports for Plumbing Piping and Equipment
3.	Section 22 07 19	-	Plumbing Piping Insulation
4.	Section 22 14 26	-	Facility Storm Drains

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Manufacturer’s technical and installation literature for all material specified or proposed in this Section for use on the project.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.7 COORDINATION

A. Certain materials will be furnished, installed, or furnished and installed, under other sections of the specifications. Examine the Construction Documents to ascertain these requirements.

B. Carefully check space requirements with other trades to ensure that all material can be installed in the spaces allotted thereto. Finished suspended ceiling elevations are indicated on the general construction drawings.

C. Transmit to trades doing work of other sections all information required for work to be provided under their respective sections (such as foundations, electric wiring, access doors, and the like) in ample time for installation.

D. Set all inserts for all pipes in ample time to allow the work of the other trades to be performed at the scheduled time.

E. Furnish and set all sleeves for passage of pipes through structural masonry and concrete walls and floors and elsewhere as required for proper protection of each pipe passing through building surfaces.

F. Field drilling, cutting and/or reinforcing of holes in structural metal deck required for work under this section must be coordinated for all trades and must be approved by a Professional Engineer licensed in the State of New York.

G. Should the Subcontractor neglect to perform preliminary work and should cutting be required to install equipment, the expense of this cutting and restoring of surfaces to their original condition must be borne by this Subcontractor.

H. Due to the type of the installation, a fixed sequence of operation is required to properly install the complete systems. It must be the responsibility of this Subcontractor to coordinate, protect and schedule the work with other trades in accordance with the construction sequence.

I. Architectural drawings must be checked for ceiling height requirements.

1.8 WARRANTY

A. Furnish a one (1) year manufacturer’s warranty for the entire storm water drainage system.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. The system must be able to handle expected peak flow rates during storms without causing flooding or backups.

B. The system components should be durable and able to withstand the expected loads and environmental conditions over their design life.

C. The System should comply with relevant standards.

2.2 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following:

1. Cast Iron Pipe and Fittings

a. ABI Foundry Company.
b. Charlotte Pipe & Foundry.
c. Tyler Pipe & Foundry.
d. Or approved equal.

2. Ductile Iron Pipe and Fittings

a. Charlotte Pipe & Foundry.
b. Tyler Pipe.
c. US Pipe.
d. Or approved equal.

3. Mechanical Couplings and Grooved Fittings

a. Grinnell.
b. Gruv-Lok.
c. Victaulic.
d. Or approved equal.

4. No-Hub Heavy-Duty Couplings

a. Husky Heavy Duty Couplings.
b. Mission Heavy Weight Couplings.
c. Fernco Heavy Duty Couplings
d. Or approved equal

2.3 GENERAL REQUIREMENTS

A. All materials and equipment must be new, in good condition and free from defect. The commercially standard items of equipment and the specific names mentioned herein are intended to identify standards of quality and performance necessary for the proper functioning of the work.

B. Since manufacturing methods vary, reasonable minor variations are expected; however, performance and material requirements specified herein are the minimum standards acceptable.

C. Materials and equipment which are found to have factory defects must be replaced or repaired in a manner acceptable to the Commissioner at no additional cost to the City of New York. The Subcontractor must be responsible for all costs associated with testing,

replacement, or repair, including but not limited to, all replacement or repair costs, preparations prior to testing and all testing costs.

2.4 MATERIALS OF PIPING SYSTEMS

A. Use the following materials in the various piping systems, in accordance with the Construction Documents.

B. Cast Iron No-Hub (C.I.N.H.)

1. Cast iron hubless pipe must be standard weight coated cast iron hubless pipe manufactured from gray cast iron with a tensile strength not less than 21,000 psi, in accordance with ASTM Specification A74 and CISPI 301.

2. Each length must be marked with the size, weight per foot and manufacturer's name clearly cast or stamped on each length.

3. Pipe must be manufactured by a member of the Cast Iron Soil Pipe Institute (CISPI).

C. Cast Iron Soil Pipe (C.I.S.P.)

1. Cast iron soil pipe must be service weight coated cast iron soil pipe, hub and spigot type manufactured from gray cast iron with a tensile strength not less than 21,000 psi, in accordance with ASTM Specification A74.

2. Each length must be marked with the size, weight per foot and manufacturer's name clearly cast or stamped on each length.

3. Pipe must be manufactured by a member of the Cast Iron Soil Pipe Institute (CISPI).

D. Extra Heavy Cast Iron (E.H.C.I.)

1. Extra-heavy coated cast iron soil pipe must be heavy weight, bell and spigot pipe manufactured from gray cast iron with a tensile strength not less than 21,000 psi, in accordance with ASTM Specification A74.

2. Each length must be marked with the size, weight per foot and manufacturer's name clearly cast or stamped on each length.

3. Pipe must be manufactured by a member of the Cast Iron Soil Pipe Institute (CISPI).

E. Galvanized Steel Pipe (G.S.P.)

1. Galvanized steel pipe must be seamless or welded in accordance with the latest issue of ASTM Standard A53.

2. Pipe must be Schedule 40, galvanized steel as scheduled.

3. Each length must be hydrostatically tested at the mill and the producer's certification of said tests must be furnished.

4. Pipe working pressures, test pressures and finish must be as scheduled or as indicated on the construction documents.

2.5 PIPE JOINTS AND FITTINGS

A. All fittings must be of a type which maintains full wall thickness at all points, ample radius and fillets, and proper bevels or shoulders at ends.

B. Use the following materials in the various piping systems, in accordance with the construction documents.

C. Cast Iron No-Hub (C.I.N.H.)

1. Cast iron no-hub fittings must be standard weight coated cast iron hubless drainage fittings manufactured from gray cast iron with a tensile strength not less than 21,000 psi, in accordance with ASTM Specification A74 and CISPI 301.

2. Cast iron no-hub fittings must be joined with "Heavy Duty" no-hub couplings constructed of a shielded coupling.

3. Couplings must be constructed of Type 304 stainless steel with 305 stainless steel worm drive screws and comply with ASTM Specification C1540.

4. The gasket material must be neoprene and conform to ASTM Specification C564,

5. The coupling assembly must be torqued to manufacturer's specified requirements.

6. Heavy duty no-hub couplings must be used.

D. Cast Iron Soil Pipe (C.I.S.P.)

1. Cast iron soil pipe fittings must be service weight, coated cast iron bell and spigot type manufactured from gray cast iron with a tensile strength not less than 21,000 psi, in accordance with ASTM Specification A74.

2. Cast iron soil fittings must be joined by elastomeric compression gaskets.

3. Gaskets must be neoprene elastomeric compression type gaskets conforming to ASTM Standard C564.

E. Galvanized Steel (G.S.P.)

1. Joints between lengths of galvanized steel piping must be threaded, flanged, grooved or welded as scheduled herein below or on the Construction Documents.

2. Make screwed joints without the use of lampwick or filler, except "utility compound" or Teflon tape applied to male threads only.

3. Fittings for use with Grooved Galvanized Steel Pipe (G.G.S.P.) must be cast ductile iron scheduled to match the piping material the fittings will be connected to. All fittings must be hot dip galvanized to ASTM Specification A153.

4. Mechanical couplings may be used in lieu of threaded galvanized steel fittings.

5. Mechanical couplings must consist of two (2) pieces of hot dipped galvanized ductile iron housings conforming to ASTM Specification A536, Grade 65-45-12, with angled pads.

6. Coupling gaskets must be Grade "E" EPDM synthetic rubber.

7. Coupling bolts and nuts must be heat-treated carbon steel, trackhead design conforming to physical properties of ASTM Specification A183.

8. All mechanical couplings for galvanized steel pipe must be rigid coupling with galvanized finish.

9. Installation of mechanical couplings must be per manufacturer's latest recommendations.

10. Supply grooved full-flow standard radius fittings with roll-grooved ends.

F. Extra Heavy Cast Iron (E.H.C.I.)

1. Extra-heavy coated cast iron soil fittings must be heavy weight, bell and spigot type manufactured from gray cast iron with a tensile strength not less than 21,000 psi, in accordance with ASTM Specification A74.

2. Extra-heavy cast iron soil fittings must be joined by elastomeric compression gaskets.

3. Gaskets must be neoprene elastomeric compression type gaskets conforming to ASTM Standard C564.

G. Flanges and Flanged Fittings

1. The pressure-temperature rating of the pipe flanges must match the pressure-temperature rating of the flanges on the equipment to which the piping connects.

2. Flanged fittings for D.I.W.P. must be in accordance with AWWA C-115.

3. Do not use cast iron screw-on flanges in pump discharge piping. For this service, use cast steel or ductile iron flanges.

H. Elbows

1. All elbows must be of long radius pattern except where space conditions do not permit.

2. Welding elbows must be 45-degree mill beveled or machine beveled.

3. Grooved-end elbows must be the long radius type manufactured from standard wall pipe conforming with the material of the system which it is installed.

I. Gaskets: Gaskets used in sanitary drainage systems must be Grade "E" EPDM rated for a maximum temperature of 230°F (110°C) and maximum pressure of 400 psig (27.5 bar).

2.6 SYSTEM MATERIAL SCHEDULE

Service	Size	Pipe Type	Weight	Fitting Type
Storm Drainage Risers (Stacks) Above 2nd Floor	2 in. (50 mm) through 10 in. (250 mm)	Cast Iron No-Hub Cast Iron Soil Pipe	Service Weight	Heavy Duty No-Hub Couplings Gasketed Bell & Spigot
	12 in. (100 mm) through 15 in. (375 mm)	Cast Iron Soil Pipe,	Service Weight	Gasketed Bell & Spigot
Storm Drainage Branch Piping	2 in. (50 mm) through 10 in. (250 mm)	Cast Iron No-Hub Cast Iron Soil Pipe,	Service Weight	Heavy Duty No-Hub Couplings Gasketed Bell & Spigot

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Accept all materials and equipment in factory packaging and examine for visible damage. All damaged material and equipment must be removed from the job site and replaced by the manufacturer.

B. Verify existing conditions prior to starting work.

C. Carefully check space requirements with other trades to ensure that all material can be installed in the spaces allotted thereto.

D. The Subcontractor will provide benchmarks, monuments, and other reference points on the job, which will be available for this Subcontractor's use.

E. Maintain all existing benchmarks, monuments and other reference points and perform all field engineering required to ensure that work under this section must conform with grades, elevations and lines required.

3.3 INSTALLATION

A. All piping and materials must be as specified herein and must be installed in accordance with the latest industry standards, per the manufacturer's recommendations, and as indicated on the drawings.

B. Run and arrange piping approximately as indicated on the Construction Documents and as coordinated with other trades.

C. Install piping as neatly spaced, straight and direct as possible, forming right angles or parallel lines with building walls and other pipes.

D. Erect all risers plumb and true, parallel with walls and other pipes.

E. Ream all pipe smoothly before installation. Do not bend, split, flatten nor otherwise injure pipe.

F. The Subcontractor must provide all equipment and appurtenances necessary to complete the installation, whether indicated on the drawings or not.

G. Do not install pipes or other apparatus in a manner which interferes with the full swing of the doors.

H. It is the responsibility of this Subcontractor for accurately laying out the work. Should it be found that any work is laid out so that interferences will occur, report that to the Commissioner before commencing work.

I. No piping must pass over high voltage (440V) electrical bus duct or switchgear equipment. Where required, provide protective pans under or over individual pipes and construct the pans of 16-gauge stainless steel with a 6 in. (150 mm) lip, the corners being welded to make the pans watertight. Give each pan three (3) coats of paint and support with pipe hangers and drain clear of the equipment below.

J. Route piping in an orderly manner parallel and perpendicular to walls maintaining gradient and headroom without interfering with use of space or taking more space than necessary. Whenever practical group piping at common elevations.

K. Furnish and install sleeves for pipe passing through roofs, partitions, walls and floors. Piping penetrating roofs must maintain integrity of roof assembly.

L. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

M. All piping must be carefully sloped so as to eliminate traps and pockets.

N. Piping exposed in all rooms must be installed as nearly as possible parallel with or at right angles to the building walls. Install all pipe straight and true. Springing or forcing piping into place will not be permitted unless specifically called for. Install piping in such a manner as to prevent strain on equipment connections. Install piping in such a manner as to eliminate all static and dynamic conditions of loading on equipment connections.

O. Piping in finished portions of the building, except in mechanical equipment rooms or where otherwise indicated on the Drawings, must be concealed.

P. All piping must be of the sizes indicated and must be routed as indicated on the Drawings, or as required, to serve all equipment and systems.

Q. In each change of direction of storm drainage piping, provide a clean-out plug connected to same with Y fittings and 45° ell made flush with floor or wall.

R. In all horizontal straight runs more than 50 feet (15.25 m) of length, provide at least one clean-out for each 50 feet (15.25 m) of length.

S. Where pipe is buried, cleanouts must be brought up flush with floor or grade unless otherwise shown on the drawings. The locations of all clean-outs must be verified with the Commissioner.

T. Provide access doors in general construction for clean-outs installed in concealed locations.

U. All drainage lines must have at least the minimum slope toward the main sewer. Pipe must be so laid that the slope will be continuous. Permission must be secured from the Commissioner before proceeding with any work where existing conditions prevent the installation at the minimum grade specified.

V. All horizontal pipe throughout the building, including that in pipe spaces and attics, must be thoroughly and substantially supported from the building construction by means of approved expansion ring hangers or clevis hangers at each joint. Hangers must be spaced in accordance with Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.

W. All pipes must be straight and have uniform fall.

X. All vertical pipes must be substantially supported at each floor level with approved steel or iron riser clamps.

Y. Provide additional rod and banding at each joint for all storm house drain offsets consisting of riser clamps and threaded rod to anchor all fittings in the horizontal offset. This method of anchoring and support must be provided in addition to the sway bracing described in the paragraph above.

Z. Bell and Spigot Piping

1. Bell and spigot piping must be joined with elastomeric compression gaskets as specified.

2. Joints must be cleaned free from dirt, mud, sand, gravel or foreign materials.

3. The gasket must be folded and inserted into the hub completely, with the flange of the gasket remaining outside of the hub.

4. Lubricate the joint and compress the piping into the joint so the spigot end of the pipe bottoms out in the hub.

AA. Hubless Cast Iron Piping

1. Hubless cast iron piping must be joined with heavy duty no-hub couplings as specified.

2. Joints must be cleaned free from dirt, mud, sand, gravel or foreign materials.

3. The gasket must be installed on one end of the pipe or fitting and the stainless-steel clamp and shield on the other end.

4. Firmly seat the pipe or fitting ends against the center stop of the gasket and slide the shield into position over the gasket.

5. The stainless-steel bands must be tightened using a calibrated torque wrench set to the manufacturer's recommended settings. Bands must be in sequence according to the manufacturer's recommendations.

BB. Grooved Piping

1. All grooved end components must be the product of one manufacturer.

2. The manufacturer must provide on-site instructing for Subcontractor's field personnel by a factory instructed representative in the proper use of grooving tools, application of groove, and product installation. In addition, the manufacturer's representative must periodically visit the job site and inspect installation. Subcontractor must remove and replace any improperly installed products.

3. Piping must have rolled or cut grooved-ends as appropriate to pipe material, wall thickness, pressures, size and method of joining. Pipe ends must be grooved in accordance with coupling manufacturer's current listed standards.

4. Mechanical couplings for grooved pipe couplings must be of the rigid type as required for the installation, with plated nuts and bolts to secure housing sections together and a synthetic rubber flush seal gasket of the cavity pressure responsive design.

5. Grooved piping systems must be installed in accordance with the requirements of the manufacturer's latest published literature.

6. Flexible type couplings must be installed at final connections to equipment and/or in locations where vibration attenuation and stress relief are required as determined by the Commissioner.

7. Coupling housings must be cast ductile iron conforming to ASTM A 536 (Grade 65-45-12), hot-dipped galvanized finished or Type 316 stainless steel conforming to ASTM A 351, A 743 or A 744.

8. Flange adapters must be cast ductile iron, hot-dipped galvanized conforming to ASTM A 536 (Grade 65-45-12), or stainless steel constructed from corrosion resistant Grade CF8M (Type 316 equivalent). Flange adapters must engage directly into roll grooved stainless steel pipe and fittings and bolt directly to ANSI Class 125 cast iron and Class 150 steel flange components.

9. Gaskets for mechanical couplings and flange adapters must be molded flush seal type conforming to the outside diameter of the steel pipe. Synthetic rubber of elastomers having properties as indicated in ASTM D 2000 must be used. Gasket selection must comply with the coupling manufacturer's standards, installation and design requirements and must be suitable for the intended service and temperature range.

10. Gaskets for water service from -30°F (-34°C) to 230°F (110°C) must be Grade "E" EPDM.

11. Bolts for mechanical couplings must be zinc plated (ASTM B 633) heat treated carbon steel track head conforming to physical properties of ASTM A 183, minimum tensile strength 110,000 psi (7,585 bar).

3.4 CLEANING

A. During construction, properly cap all lines, so as to prevent the entrance of sand, dirt, etc. Each system of piping must be blown through after completion for as long a time as required to thoroughly clean the apparatus.

B. Before final adjustments are made and before operation of equipment, clean and remove all accumulation of dirt, chips or other deleterious material. Leave all storm piping and appurtenances in suitable condition, before substantial completion.

C. Cover and protect all openings left in floor for passage of pipes. Protect pipes with suitable coverings as soon as set. Close all open ends of pipes with a plug fitting to prevent obstruction and damage.

D. Protect the system against freezing in cold weather.

E. After each hydrostatic leak testing procedure is complete, drain the system until empty. Liquid for hydrostatic testing of storm systems must be clean domestic water from the municipal water supply.

3.5 INSPECTION AND START UP SERVICE

A. All inspections, examinations, and tests required must be arranged by this Subcontractor at no additional cost to the City of New York as necessary to obtain complete and substantial completion of the system as installed.

B. The certificates of inspection must be provided in quadruplicate and must be delivered to the Commissioner for distribution.

C. Inspect all piping, hangers, rod and support for piping and equipment for proper installation according to the manufacturer's instructions.

D. Repair, or if required by the Commissioner replace, defective work with new work without additional cost to the City of New York. Repeat tests as directed, until all work is proven satisfactory.

E. Restore to its original condition any work damaged or disturbed by tests, engaging the original trades to do the work of restoration.

F. Notify the Commissioner and Inspectors at least 48 hours in advance of making the required tests, so that arrangements may be made for their presence to witness the tests.

G. Test equipment in service and demonstrate that the equipment performs the work intended for it and that it complies with the requirements of these specifications for such equipment.

3.6 FIELD QUALITY CONTROL

A. Quality control must comply with DDC General Conditions: Field inspecting, testing, adjusting, and balancing.

B. Grooved Piping Installation Certification: A factory inspector must inspect the installation of all grooved piping products to ensure that the installation has been made in accordance with the manufacturer's installation instructions as follows:

1. The inspector must perform periodic observations of coupling installations in accordance with the latest revisions of the coupling manufacturer's installation instructions. The frequency of the observations must be adjusted with the pace of the project to ensure that no less than ten percent (10%) twenty percent (20%) of the installation is observed at each stage of completion.

2. The inspector must have the authority to randomly select which fittings will be inspected. The Installing Subcontractor must provide access to all fittings.

3. The inspector's observations must be recorded, and all deficiencies noted in the installation must be tagged for remediation.

4. At the conclusion of each day's observations the inspector must issue a report of their findings referencing the specific systems examined and describing any

deficiencies requiring corrective action to the Commissioner and the Installing Subcontractor.

5. Based on the results of the observation reports a determination of the extent of the subsequent testing beyond the minimum must be established by the Commissioner.

6. Upon conclusion of the required inspections and confirmation that any and all deficiencies have been corrected the manufacturer must provide a report to the Commissioner and Installing Subcontractor certifying that the entire installation is in compliance with the manufacturer's requirements.

7. Additional testing above and beyond the protocol requirements listed above and all costs associated with repair, replacement, and schedule impacts, must be at no additional cost to the City of New York.

3.7 FIELD TESTS

A. Performance Test

1. Allow sufficient time to perform all tests, adjustments, necessary to place the various systems in final operation condition, verify performance requirements and check all safety devices. Labor and instruments, required for various tests must be provided. See that all manufacturers' representatives necessary to check and adjust various systems are present with sufficient labor to perform all this work without delay. All test data must be recorded on suitable forms and submitted to the Commissioner for approval.

2. A qualified representative of the equipment manufacturer must be present at the test. The Commissioner may witness tests. The Subcontractor must notify the Commissioner in writing, at least two (2) weeks prior to the day of the test.

3. Test all systems before any paint is applied, piping is insulated, furred in or otherwise covered.

4. The Contractor will provide all devices, materials, supplies, labor and power required in connection with tests. Make all tests in the presence and to the satisfaction of the Commissioner.

5. Hubless Cast Iron and Bell and Spigot Cast Iron:

   a. Subject the drains and storm piping inside the building to a water test. The water test must include the entire system from the lowest point to the highest pipe above the roof.
   b. The system must be tested to a hydrostatic pressure equivalent to at least a 10-foot (3 m) head of water.
   c. After filling, shut off water supply and allow it to stand two (2) hours, under test, during which time there must be no loss or leakage.

6. Drainage Piping with Mechanical or Welded Joints:

   a. Subject the storm drainage piping to a hydrostatic test, but in no case must the system be tested at less than 150 psig (10.5 bar) hydrostatic pressure where mechanical or welded joints are installed.
   b. Apply the test for a minimum of two (2) consecutive hours with no loss in pressure.
   c. Prior to applying the hydrostatic test, the system must be tested with 50 psig (3.5 bar) compressed air for a period of ten minutes with no loss in pressure.

B. Substantial Completion Test

1. The final check of all systems will be performed only after the Subcontractor has completed and returned to the Commissioner all recorded test data, together with letter that the work is 100% complete. Field performance tests will be required by the Commissioner at this time to verify performance and workmanship, and to make final system component adjustments.

2. Points and areas for recheck must be selected by the Commissioner.

3. Measurements and tests must be the same as the original test procedures.

4. After satisfactory passing of the field tests and after all necessary adjustments have been made, test the complete systems for a minimum of seven (7) days under regular operating conditions or as long as may be required to establish compliance with Contract Documents.

5. The Subcontractor must demonstrate to the Commissioner, prior to acceptance, that all systems and/or equipment has been balanced and adjusted properly, and that the system and/or equipment is in compliance with the Contract Documents.

3.8 ADJUSTING AND BALANCING

A. Upon completion of insulation, hangers for piping and at equipment must be adjusted to ensure that the loads are distributed evenly and that there are no loads imposed by the piping or the equipment that it is connected to.

B. Securely tighten clevis hanger load nuts first to ensure proper hanger performance. Tighten the top nut after adjustment.

END OF SECTION 22 14 13

SECTION 22 14 26 - FACILITY STORM DRAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 roof drains required for equipment as indicated on and in accordance with the requirements of the Contract Documents.

B. Section includes:
1. Drains.
2. Drain flashing.

1.3 RELATED SECTIONS

A. The following specification sections apply to all work herein:

1.	Section 22 05 00	-	Common Work Results for Plumbing
2.	Section 22 05 29	-	Hangers and Supports for Plumbing, Piping and Equipment
3.	Section 22 07 19	-	Plumbing Piping Insulation
4.	Section 22 14 13	-	Facility Storm Drainage Piping

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Manufacturer’s technical and installation literature for all material specified or proposed in this Section for use on the project.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”

1.7 WARRANTY

A. Furnish a five (5) year manufacturer’s warranty for each roof drain.

B. The warranty period must commence upon substantial completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. The system must be able to handle expected peak flow rates during storms without causing flooding or backups.

B. The system should minimize the accumulation of sediment and debris, which can reduce the flow capacity and increase maintenance requirements.

C. The system components should be durable and able to withstand the expected loads and environmental conditions over their design life.

D. The system should be installed for ease of inspection and maintenance to ensure continued performance over time.

2.2 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following:

1. Roof Drains

a. Jay R. Smith.
b. Josam.
c. Wade Mfg.
d. Zurn Industries.
e. Or approved equal.

2.3 GENERAL REQUIREMENTS

A. All materials and equipment must be new, in good condition, and free from defects. The commercially standard items of equipment and the specific names mentioned herein are intended to identify standards of quality and performance necessary for the proper functioning of the Work.

B. Since manufacturing methods vary, reasonable minor variations are expected; however, performance and material requirements specified herein are the minimum standards acceptable.

C. Materials and equipment which are found to have factory defects must be replaced or repaired in a manner acceptable to the Commissioner at no additional cost to the City of New York. The Subcontractor must be responsible for all costs associated with testing, replacement, or repair, including but not limited to, all replacement or repair costs, preparations prior to testing and all testing costs.

2.4 DRAINS

A. All roof drains used must be cast iron body with grating material, loading and finishing as scheduled. Roof drains must be engineered and manufactured in accordance with ASME A112.21.2M.

2.5 DRAIN FLASHING

A. Provide flashing for all roof, area, and trench drains where waterproofing is required.

B. All roof drains, installed in roofs having waterproof membrane flashing must be flashed with lead not less than 3 lbs/sq.ft. or 16 oz. copper flashing built 6 in. (150 mm) into the waterproof membrane.

C. Include underdeck clamps and perforated extension as scheduled, with the drain if required to properly seal the drain to the roof and waterproofing furnished.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Accept all materials and equipment in factory packaging and examine for visible damage. All damaged material and equipment must be removed from the job site and replaced by the manufacturer.

B. Verify existing conditions prior to starting work.

C. Carefully check space requirements with other trades to ensure that all material can be installed in the spaces allotted thereto.

D. Wherever this Subcontractor's work interconnects with the work of other Subcontractors, this Subcontractor must coordinate all work with these Subcontractors to ensure that all Subcontractors have 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 Ceiling Trade may know where to install access doors and panels.

E. The Subcontractor will provide benchmarks, monuments, and other reference points on the job, which will be available for this Subcontractor's use.

F. Maintain all existing benchmarks, monuments, and other reference points and perform all field engineering required to ensure that work under this section must conform with grades, elevations and lines required.

3.3 INSTALLATION

A. All drains must be as specified herein and must be installed in accordance with the latest industry standards, per the manufacturer's recommendations, and as indicated on the Drawings.

B. Run and arrange piping approximately as indicated on the construction documents and as coordinated with other trades.

C. Install piping as neatly spaced, straight and direct as possible, forming right angles or parallel lines with building walls and other pipes.

D. The Subcontractor must provide all equipment and appurtenance necessary to complete the installation, whether indicated on the drawings or not.

E. It is the responsibility of this Subcontractor to accurately lay out the work. Should it be found that any work is laid out so that interferences will occur, report that to the Commissioner before commencing work.

F. Protect systems from the entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of the completed system.

G. All piping must be carefully sloped so as to eliminate traps and pockets.

H. All pipes must be straight and have uniform fall.

3.4 CLEANING

A. During construction, properly protect all equipment, so as to prevent the entrance of sand and dirt. Each drain must be thoroughly cleaned after completion for as long a time as required to thoroughly clean the apparatus.

B. Before final adjustments are made and before operation of equipment, clean and remove all accumulation of dirt, chips, or other deleterious material. Leave all drains in suitable condition for operation, before substantial completion.

C. Protect the system against freezing in cold weather.

D. After each hydrostatic leak testing procedure is complete, drain the system until empty. Liquid for hydrostatic testing of sanitary systems must be clean domestic water from the municipal water supply.

3.5 INSPECTION AND STARTUP SERVICE

A. Inspect all roof drains verifying there are no obstructions, and the gratings are installed as specified.

3.6 FIELD TESTS

A. Performance Test: All roof, area, and trench drains must be subjected to a water test as part of the sanitary system water test specified in Section 22 14 13 - Facility Storm Drainage Piping.

3.7 ADJUSTING AND BALANCING

A. Upon completion of the piping, hangers for piping and equipment must be adjusted to ensure that the loads are distributed evenly and that there are no loads imposed by the piping or the equipment that it is connected to.

B. Securely tighten clevis hanger load nuts first to ensure proper hanger performance. Tighten top nut after adjustment.

C. Securely tighten all roof drain gratings tight to floor or drain body. Raised grates posing tripping hazards is not acceptable.

END OF SECTION 22 14 26

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. Work Included:
   1. The work includes providing all labor, materials, equipment, accessories, services and tests necessary to complete and make ready for operation by the City of New York, all Heating, Ventilating and Air Conditioning Work as shown on the Drawings. and hereinafter specified, including, but not limited to the following:
      a. Piping, fittings, and valves.
      b. Sheet metal ductwork and accessories such as dampers, access doors, etc.
      c. Installation of smoke detectors in ductwork.
      d. Acoustical duct lining.
      e. Pipe, duct and equipment insulation.
      f. Test and balancing.
      g. Sleeves, pipe inserts and anchor bolts, escutcheons, prefabricated roof curbs, etc., as hereinafter specified.
      h. Identification, name plates, tags and charts.
      i. Cutting and rough patching.
      j. All demolition work associated with HVAC systems.

1.3 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.5 SUBMITTALS

A. Submit shop drawings covering the following items:
   1. Coordination drawings.
   2. Identification schedule and samples.
   3. Air filters and draft gauges.
   4. Schedule of ductwork, joints, gauges, supports, flexible connections, fire dampers, access doors, etc.
   5. Sheet metal fabrication drawings.

6. Schedule of piping and fitting materials.
7. Piping shop drawings.
8. Schedule of pipe and ductwork supports, including inserts, escutcheons, etc.
9. Schedule of insulation types and samples of each type.
10. Acoustic material.

B. All shop drawings being submitted that include electrical work must be submitted with all internal and external wiring diagrams.

C. The previously listed items are major equipment and do not limit this Section's responsibility to submit shop drawings for all equipment and accessories that are to be provided under this Section of Specifications.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Draft Gauges
   a. Dwyer
   b. Ashcroft
   c. Winters
   d. or approved equal.

2. Water Specialties
   a. Bell & Gossett
   b. Taco
   c. Armstrong
   d. or approved equal.

3. Thermometers & Pressure Gauges
   a. Ashcroft
   b. Weiss Instruments
   c. Winters
   d. or approved equal.

4. Valves
   a. Milwaukee Valve
   b. Crane
   c. Hammond Valve
   d. or approved equal.

5. Insulation and Acoustic Lining
   a. Owens-Corning Fiberglass Corp.
   b. CSG Snap-on

c. Johns Manville
d. or approved equal.

6. Vibration Isolation
   a. VMC East
   b. Mason Industries
   c. Korfund Corp
   d. or approved equal.

7. Product Refrigeration
   a. Dunham-Bush
   b. Daikin Industries
   c. Mitsubshi
   d. or approved equal.

8. Internal Cleaning & Treating of Piping
   a. Heating Economy Services Co., Inc.
   b. Tower Water Management
   c. The Metro Group, Inc.
   d. Drew Chemical Co.
   e. Or approved equal.

9. Electric Heating Elements
   a. Qmark
   b. Indeeco
   c. Tempco
   d. Or approved equal.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 23 05 00

SECTION 23 05 17 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

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. Sleeves.
2. Stack-sleeve fittings.
3. Sleeve-seal systems.
4. Sleeve-seal fittings.
5. Grout.
6. Escuthcheons
7. Floor plates

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: Submit product data and cutsheets for the following components for the Commissioner’s review:

1. Sleeves.
2. Stack-sleeve fittings.
3. Sleeve-seal systems.
4. Sleeve-seal fittings.
5. Grout.
6. Escutcheons
7. Floor plates

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. The sleeves and seals should be compatible with the materials used in the pipes and structures they are sealing, such as concrete, PVC, or metal.

B. The sleeves and seals should provide a water-tight seal to prevent leakage at joints and connections.

C. The sleeves and seals should be resistant to chemicals commonly found in constructions, such as acids, alkalis, and oils.

D. The sleeves and seals should be easy to install and should not require specialized tools.

E. The sleeves and seals should be able to withstand the temperatures encountered in the environment without degrading or losing effectiveness.

F. The sleeves and seals should comply with relevant standards for mechanical systems, such as ASTM standards and NYC Building Code.

G. The escutcheons should be made from a durable material that is resistant to corrosion and degradation, such as stainless steel, or brass.

H. The escutcheons should be available in various sizes to fit different pipe diameters commonly used in HVAC systems. They should also be compatible with the type of piping material used.

I. The escutcheons should be able to withstand the temperatures encountered in HVAC systems without deforming or losing their protective properties.

J. The escutcheons should be easy to install, requiring basic tools and skills. They should also provide a secure and stable fit once installed.

K. The escutcheons should have a clean and professional appearance, enhancing the overall look of the HVAC system.

L. The escutcheons should comply with relevant standards for HVAC systems, such as those set by ASHRAE and NYC Building Code.

2.2 SLEEVES

A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral water stop unless otherwise indicated.

B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.

C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.

D. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

2.3 STACK-SLEEVE FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Advance Products & Systems, Inc.
2. CALPICO, Inc.
3. Metraflex Company (The).
4. Pipeline Seal and Insulator, Inc.
5. Proco Products, Inc.
6. Or approved equal.

B. Description: Manufactured cast-iron sleeve with integral clamping flange. Include clamping ring, bolts, and nuts for membrane flashing.

1. Underdeck Clamp: Clamping ring with setscrews.

2.4 SLEEVE-SEAL SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Advance Products & Systems, Inc.
2. CALPICO, Inc.
3. Metraflex Company (The).
4. Pipeline Seal and Insulator, Inc.
5. Proco Products, Inc.
6. Or approved equal.

B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.

1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Pressure Plates: Stainless steel.
3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.5 SLEEVE-SEAL FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Advance Products & Systems, Inc.
2. CALPICO, Inc.
3. Metraflex Company (The).
4. Pipeline Seal and Insulator, Inc.
5. Proco Products, Inc.
6. Or approved equal.

B. Description: Presealed system. Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall. Unit has plastic or rubber waterstop collar with center opening to match piping outer diameter.

2.6 GROUT

A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

B. Characteristics: Non-shrink; recommended for interior and exterior applications.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.7 ESCUTCHEONS

A. One-Piece, Cast-Brass Type: With polished, chrome-plated and rough-brass finish and setscrew fastener.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.

C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.

D. Split-Casting Brass Type: With polished, chrome-plated and rough-brass finish and with concealed hinge and setscrew.

E. Split-Plate, Stamped-Steel Type: With chrome-plated finish, concealed and exposed-rivet hinge, and spring-clip fasteners.

2.8 FLOOR PLATES

A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.

B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 SLEEVE INSTALLATION

A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.

B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.

C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.

1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
2. Cut sleeves to length for mounting flush with both surfaces.

    a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 4 inches above finished floor level.

3. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.

D. Install sleeves for pipes passing through interior partitions.

1. Cut sleeves to length for mounting flush with both surfaces.
2. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 079200 "Joint Sealants."

E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.3 STACK-SLEEVE-FITTING INSTALLATION

A. Install stack-sleeve fittings in new slabs as slabs are constructed.

1. Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.

2. Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing. Comply with requirements for flashing specified in Section 076200 "Sheet Metal Flashing and Trim."
3. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
4. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
5. Using grout, seal the space around outside of stack-sleeve fittings.

B. Fire-Barrier Penetrations: Maintain indicated fire rating of floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.4 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.

B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.5 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

3.6 SLEEVE AND SLEEVE-SEAL SCHEDULE

A. Use sleeves and sleeve seals for the following piping-penetration applications:

1. Exterior Concrete Walls above Grade:

   a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
   b. Piping NPS 6 and Larger: Cast-iron wall sleeves or galvanized steel-pipe sleeves.

2. Concrete Slabs above Grade:

a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
b. Piping NPS 6 and Larger: Galvanized steel-pipe sleeves.

3.7 ESCUTCHEON INSTALLATION

A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.

B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.

1. Escutcheons for New Piping:

a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
b. Chrome-Plated Piping: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
c. Insulated Piping: One-piece, stamped-steel type .
d. Bared Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.
e. Bared Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type.
f. Bared Piping in Unfinished Service Spaces: One-piece, stamped-steel type.
g. Bared Piping in Equipment Rooms: One-piece, stamped-steel type.

2. Escutcheons for Existing Piping:

a. Chrome-Plated Piping: Split-casting brass type with polished, chrome-plated finish.
b. Insulated Piping: Split-plate, stamped-steel type with exposed-rivet hinge.
c. Bared Piping at Wall and Floor Penetrations in Finished Spaces: Split-plate, stamped-steel type with exposed-rivet hinge.
d. Bared Piping at Ceiling Penetrations in Finished Spaces: Split-plate, stamped-steel type with exposed-rivet hinge.
e. Bared Piping in Unfinished Service Spaces: Split-plate, stamped-steel type with exposed-rivet hinge.
f. Bared Piping in Equipment Rooms: Split-plate, stamped-steel type with exposed-rivet hinge.

C. Install floor plates for piping penetrations of equipment-room floors.

D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.

1. New Piping: One-piece, floor-plate type.
2. Existing Piping: Split-casting, floor-plate type.

3.8 FIELD QUALITY CONTROL

A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 23 05 17

SECTION 23 05 23 - GENERAL-DUTY VALVES FOR HVAC 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. Bronze angle valves.
2. Brass ball valves.
3. Bronze ball valves.
4. Iron ball valves.
5. Iron, single-flange butterfly valves.
6. Iron, grooved-end butterfly valves.
7. High-performance butterfly valves.
8. Bronze lift check valves.
9. Bronze swing check valves.
10. Iron swing check valves.
11. Iron swing check valves with closure control.
12. Iron, grooved-end swing-check valves.
13. Iron, center-guided check valves.
14. Iron, plate-type check valves.
15. Bronze gate valves.
16. Iron gate valves.
17. Bronze globe valves.
18. Iron globe valves.
19. Lubricated plug valves.
20. Eccentric plug valves.
21. Chainwheels.

B. Related Sections:

1. Section 230553 "Identification for HVAC Piping and Equipment" for valve tags and schedules.

1.3 DEFINITIONS

A. CWP: Cold working pressure.

B. EPDM: Ethylene propylene copolymer rubber.

C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.

D. NRS: Non rising stem.

E. OS&Y: Outside screw and yoke.

F. RS: Rising stem.

G. SWP: Steam working pressure.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, "Section 013300 "Submittal Procedures."

1.5 SUBMITTALS

A. Product Data: For each type of valve indicated.

B. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner's review:

1. Bronze angle valves.
2. Brass ball valves.
3. Bronze ball valves.
4. Iron ball valves.
5. Iron, single-flange butterfly valves.
6. Iron, grooved-end butterfly valves.
7. High-performance butterfly valves.
8. Bronze lift check valves.
9. Bronze swing check valves.
10. Iron swing check valves.
11. Iron swing check valves with closure control.
12. Iron, grooved-end swing-check valves.
13. Iron, center-guided check valves.
14. Iron, plate-type check valves.
15. Bronze gate valves.
16. Iron gate valves.
17. Bronze globe valves.
18. Iron globe valves.
19. Lubricated plug valves.
20. Eccentric plug valves.
21. Chainwheels.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 01400 “Quality Requirements.”

B. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

C. ASME Compliance:

1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
2. ASME B31.1 for power piping valves.
3. ASME B31.9 for building services piping valves.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.
2. Protect threads, flange faces, grooves, and weld ends.
3. Set angle, gate, and globe valves closed to prevent rattling.
4. Set ball and plug valves open to minimize exposure of functional surfaces.
5. Set butterfly valves closed or slightly open.
6. Block check valves in either closed or open position.

B. Use the following precautions during storage:

1. Maintain valve end protection.
2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Compatibility: Products must be suitable for piping service fluids, materials, working pressures, and temperatures.

2.2 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 and larger.
2. Handwheel: For valves other than quarter-turn types.
3. Handlever: For quarter-turn valves NPS 6 and smaller except plug valves.
4. Wrench: For plug valves with square heads. Furnish the Commissioner with 1 wrench for every 10 (ten) plug valves, for each size square plug-valve head.
5. 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 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. Grooved: With grooves according to AWWA C606.
3. Solder Joint: With sockets according to ASME B16.18.
4. Threaded: With threads according to ASME B1.20.1.

F. Valve Bypass and Drain Connections: MSS SP-45.

2.3 BRONZE ANGLE VALVES

A. Class 125, Bronze Angle Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hammond Valve.
b. Milwaukee Valve Company.
c. NIBCO INC.
d. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 1.
b. CWP Rating: 200 psig.
c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded.
e. Stem and Disc: Bronze.

f. Packing: Asbestos free.
g. Handwheel: Malleable iron.

B. Class 125, Bronze Angle Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc.
b. NIBCO INC.
c. Crane Co.; Crane Valve Group; Crane Valves.
d. Crane Co.; Crane Valve Group; Jenkins Valves.
e. Crane Co.; Crane Valve Group; Stockham Division.
f. Hammond Valve.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Powell Valves.
j. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 2.
b. CWP Rating: 200 psig.
c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded.
e. Stem: Bronze.
f. Disc: PTFE or TFE.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron.

C. Class 150, Bronze Angle Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Stockham Division.
b. Kitz Corporation.
c. Crane Co.; Crane Valve Group; Crane Valves.
d. Crane Co.; Crane Valve Group; Jenkins Valves.
e. Hammond Valve.
f. Milwaukee Valve Company.
g. NIBCO INC.
h. Powell Valves.
i. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 1.

b. CWP Rating: 300 psig.
c. Body Material: ASTM B 62, bronze with integral seat and union-ring bonnet.
d. Ends: Threaded.
e. Stem and Disc: Bronze.
f. Packing: Asbestos free.
g. Handwheel: Malleable iron.

D. Class 150, Bronze Angle Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Hammond Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Powell Valves.
h. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 2.
b. CWP Rating: 300 psig.
c. Body Material: ASTM B 62, bronze with integral seat and union-ring bonnet.
d. Ends: Threaded.
e. Stem: Bronze.
f. Disc: PTFE or TFE.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron.

2.4 BRASS BALL VALVES

A. Two-Piece, Full-Port, Brass Ball Valves with Brass Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. DynaQuip Controls.
d. Flow-Tek, Inc.; a subsidiary of Bray International, Inc.
e. Hammond Valve.
f. Jamesbury; a subsidiary of Metso Automation.
g. Jomar International, LTD.
h. Kitz Corporation.

i. Legend Valve.
j. Marwin Valve; a division of Richards Industries.
k. Milwaukee Valve Company.
l. NIBCO INC.
m. Red-White Valve Corporation.
n. RuB Inc.
o. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Forged brass.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Brass.
i. Ball: Chrome-plated brass.
j. Port: Full.

B. Two-Piece, Full-Port, Brass Ball Valves with Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Flow-Tek, Inc.; a subsidiary of Bray International, Inc.
d. Hammond Valve.
e. Jamesbury; a subsidiary of Metso Automation.
f. Kitz Corporation.
g. Marwin Valve; a division of Richards Industries.
h. Milwaukee Valve Company.
i. RuB Inc.
j. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Forged brass.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Stainless steel.
i. Ball: Stainless steel, vented.

j. Port: Full.

C. Two-Piece, Regular-Port, Brass Ball Valves with Brass Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hammond Valve.
b. Jamesbury; a subsidiary of Metso Automation.
c. Legend Valve.
d. Marwin Valve; a division of Richards Industries.
e. Milwaukee Valve Company.
f. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Forged brass.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Brass.
i. Ball: Chrome-plated brass.
j. Port: Regular.

D. Two-Piece, Regular-Port, Brass Ball Valves with Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Jamesbury; a subsidiary of Metso Automation.
b. Marwin Valve; a division of Richards Industries.
c. Hammond Valve.
d. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Brass or bronze.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Stainless steel.
i. Ball: Stainless steel, vented.

j. Port: Regular.

E. Three-Piece, Full-Port, Brass Ball Valves with Brass Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Jomar International, LTD.
b. Kitz Corporation.
c. Red-White Valve Corporation.
d. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
e. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Three piece.
e. Body Material: Forged brass.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Brass.
i. Ball: Chrome-plated brass.
j. Port: Full.

F. Three-Piece, Full-Port, Brass Ball Valves with Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Jomar International, LTD.
b. Kitz Corporation.
c. Marwin Valve; a division of Richards Industries.
d. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
e. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Three piece.
e. Body Material: Forged brass.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Stainless steel.
i. Ball: Stainless steel, vented.

j. Port: Full.

2.5 BRONZE BALL VALVES

A. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc.
b. Conbraco Industries, Inc.; Apollo Valves.
c. Crane Co.; Crane Valve Group; Crane Valves.
d. Hammond Valve.
e. Lance Valves; a division of Advanced Thermal Systems, Inc.
f. Legend Valve.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Red-White Valve Corporation.
j. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
k. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Bronze.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Bronze.
i. Ball: Chrome-plated brass.
j. Port: Full.

B. Two-Piece, Full-Port, Bronze Ball Valves with Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Conbraco Industries, Inc.; Apollo Valves.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Hammond Valve.
d. Lance Valves; a division of Advanced Thermal Systems, Inc.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

h. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Bronze.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Stainless steel.
i. Ball: Stainless steel, vented.
j. Port: Full.

C. Two-Piece, Regular-Port, Bronze Ball Valves with Bronze Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc.
b. Conbraco Industries, Inc.; Apollo Valves.
c. Crane Co.; Crane Valve Group; Jenkins Valves.
d. Crane Co.; Crane Valve Group; Stockham Division.
e. DynaQuip Controls.
f. Hammond Valve.
g. Lance Valves; a division of Advanced Thermal Systems, Inc.
h. Milwaukee Valve Company.
i. NIBCO INC.
j. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Bronze.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Bronze.
i. Ball: Chrome-plated brass.
j. Port: Regular.

D. Two-Piece, Regular-Port, Bronze Ball Valves with Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Conbraco Industries, Inc.; Apollo Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Hammond Valve.
d. Milwaukee Valve Company.
e. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Bronze.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Stainless steel.
i. Ball: Stainless steel, vented.
j. Port: Regular.

E. Three-Piece, Full-Port, Bronze Ball Valves with Bronze Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Conbraco Industries, Inc.; Apollo Valves.
b. DynaQuip Controls.
c. Hammond Valve.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. Red-White Valve Corporation.
g. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Three piece.
e. Body Material: Bronze.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Bronze.
i. Ball: Chrome-plated brass.
j. Port: Full.

F. Three-Piece, Full-Port, Bronze Ball Valves with Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Conbraco Industries, Inc.; Apollo Valves.
    b. Hammond Valve.
    c. Milwaukee Valve Company.
    d. NIBCO INC.
    e. Or approved equal.

2. Description:

    a. Standard: MSS SP-110.
    b. SWP Rating: 150 psig.
    c. CWP Rating: 600 psig.
    d. Body Design: Three piece.
    e. Body Material: Bronze.
    f. Ends: Threaded.
    g. Seats: PTFE or TFE.
    h. Stem: Stainless steel.
    i. Ball: Stainless steel, vented.
    j. Port: Full.

2.6 IRON BALL VALVES

A. Class 125, Iron Ball Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. American Valve, Inc.
    b. Conbraco Industries, Inc.; Apollo Valves.
    c. Kitz Corporation.
    d. Sure Flow Equipment Inc.
    e. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
    f. Or approved equal.

2. Description:

    a. Standard: MSS SP-72.
    b. CWP Rating: 200 psig.
    c. Body Design: Split body.
    d. Body Material: ASTM A 126, gray iron.
    e. Ends: Flanged.
    f. Seats: PTFE or TFE.
    g. Stem: Stainless steel.
    h. Ball: Stainless steel.
    i. Port: Full.

2.7 IRON, SINGLE-FLANGE BUTTERFLY VALVES

A. 150 CWP, Iron, Single-Flange Butterfly Valves with EPDM Seat and Aluminum-Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Bray Controls; a division of Bray International.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corp.
e. Crane Co.; Crane Valve Group; Jenkins Valves.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Hammond Valve.
i. Kitz Corporation.
j. Milwaukee Valve Company.
k. NIBCO INC.
l. Norriseal; a Dover Corporation company.
m. Red-White Valve Corporation.
n. Spence Strainers International; a division of CIRCOR International.
o. Tyco Valves & Controls; a unit of Tyco Flow Control.
p. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
q. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 150 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.
f. Stem: One- or two-piece stainless steel.
g. Disc: Aluminum bronze.

B. 150 CWP, Iron, Single-Flange Butterfly Valves with NBR Seat and Aluminum-Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Bray Controls; a division of Bray International.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corp.
e. Crane Co.; Crane Valve Group; Jenkins Valves.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.

h. Hammond Valve.
i. Kitz Corporation.
j. Milwaukee Valve Company.
k. NIBCO INC.
l. Norriseal; a Dover Corporation company.
m. Red-White Valve Corporation.
n. Spence Strainers International; a division of CIRCOR International.
o. Tyco Valves & Controls; a unit of Tyco Flow Control.
p. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
q. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 150 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: NBR.
f. Stem: One- or two-piece stainless steel.
g. Disc: Aluminum bronze.

C. 150 CWP, Iron, Single-Flange Butterfly Valves with EPDM Seat and Ductile-Iron Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Bray Controls; a division of Bray International.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corp.
e. Crane Co.; Crane Valve Group; Center Line.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Hammond Valve.
i. Kitz Corporation.
j. Milwaukee Valve Company.
k. Mueller Steam Specialty; a division of SPX Corporation.
l. NIBCO INC.
m. Norriseal; a Dover Corporation company.
n. Spence Strainers International; a division of CIRCOR International.
o. Sure Flow Equipment Inc.
p. Tyco Valves & Controls; a unit of Tyco Flow Control.
q. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
r. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 150 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.
f. Stem: One- or two-piece stainless steel.
g. Disc: Nickel-plated ductile iron.

D. 150 CWP, Iron, Single-Flange Butterfly Valves with NBR Seat and Ductile-Iron Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Bray Controls; a division of Bray International.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corp.
e. Crane Co.; Crane Valve Group; Center Line.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Hammond Valve.
i. Kitz Corporation.
j. Milwaukee Valve Company.
k. Mueller Steam Specialty; a division of SPX Corporation.
l. NIBCO INC.
m. Norriseal; a Dover Corporation company.
n. Spence Strainers International; a division of CIRCOR International.
o. Sure Flow Equipment Inc.
p. Tyco Valves & Controls; a unit of Tyco Flow Control.
q. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
r. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 150 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: NBR.
f. Stem: One- or two-piece stainless steel.
g. Disc: Nickel-plated ductile iron.

E. 150 CWP, Iron, Single-Flange Butterfly Valves with EPDM Seat and Stainless-Steel Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Bray Controls; a division of Bray International.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corp.
e. Crane Co.; Crane Valve Group; Jenkins Valves.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Hammond Valve.
i. Kitz Corporation.
j. Milwaukee Valve Company.
k. Mueller Steam Specialty; a division of SPX Corporation.
l. NIBCO INC.
m. Norriseal; a Dover Corporation company.
n. Red-White Valve Corporation.
o. Spence Strainers International; a division of CIRCOR International.
p. Sure Flow Equipment Inc.
q. Tyco Valves & Controls; a unit of Tyco Flow Control.
r. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
s. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 150 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.
f. Stem: One- or two-piece stainless steel.
g. Disc: Stainless steel.

F. 150 CWP, Iron, Single-Flange Butterfly Valves with NBR Seat and Stainless-Steel Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Bray Controls; a division of Bray International.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corp.
e. Crane Co.; Crane Valve Group; Jenkins Valves.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Hammond Valve.
i. Kitz Corporation.
j. Milwaukee Valve Company.
k. Mueller Steam Specialty; a division of SPX Corporation.
l. NIBCO INC.

m. Norriseal; a Dover Corporation company.
n. Red-White Valve Corporation.
o. Spence Strainers International; a division of CIRCOR International.
p. Sure Flow Equipment Inc.
q. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
r. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 150 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: NBR.
f. Stem: One- or two-piece stainless steel.
g. Disc: Stainless steel.

G. 200 CWP, Iron, Single-Flange Butterfly Valves with EPDM Seat and Aluminum-Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Conbraco Industries, Inc.; Apollo Valves.
c. Cooper Cameron Valves; a division of Cooper Cameron Corp.
d. Crane Co.; Crane Valve Group; Jenkins Valves.
e. Crane Co.; Crane Valve Group; Stockham Division.
f. DeZurik Water Controls.
g. Flo Fab Inc.
h. Hammond Valve.
i. Kitz Corporation.
j. Legend Valve.
k. Milwaukee Valve Company.
l. NIBCO INC.
m. Norriseal; a Dover Corporation company.
n. Red-White Valve Corporation.
o. Spence Strainers International; a division of CIRCOR International.
p. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
q. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.

e. Seat: EPDM.
f. Stem: One- or two-piece stainless steel.
g. Disc: Aluminum bronze.

H. 200 CWP, Iron, Single-Flange Butterfly Valves with NBR Seat and Aluminum-Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Conbraco Industries, Inc.; Apollo Valves.
c. Cooper Cameron Valves; a division of Cooper Cameron Corp.
d. Crane Co.; Crane Valve Group; Jenkins Valves.
e. Crane Co.; Crane Valve Group; Stockham Division.
f. DeZurik Water Controls.
g. Flo Fab Inc.
h. Hammond Valve.
i. Kitz Corporation.
j. Legend Valve.
k. Milwaukee Valve Company.
l. NIBCO INC.
m. Norriseal; a Dover Corporation company.
n. Red-White Valve Corporation.
o. Spence Strainers International; a division of CIRCOR International.
p. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
q. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: NBR.
f. Stem: One- or two-piece stainless steel.
g. Disc: Aluminum bronze.

I. 200 CWP, Iron, Single-Flange Butterfly Valves with EPDM Seat and Ductile-Iron Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. American Valve, Inc.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corp.
e. Crane Co.; Crane Valve Group; Center Line.

f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Flo Fab Inc.
i. Hammond Valve.
j. Kitz Corporation.
k. Legend Valve.
l. Milwaukee Valve Company.
m. Mueller Steam Specialty; a division of SPX Corporation.
n. NIBCO INC.
o. Norriseal; a Dover Corporation company.
p. Spence Strainers International; a division of CIRCOR International.
q. Sure Flow Equipment Inc.
r. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
s. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.
f. Stem: One- or two-piece stainless steel.
g. Disc: Nickel-plated ductile iron.

J. 200 CWP, Iron, Single-Flange Butterfly Valves with NBR Seat and Ductile-Iron Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. American Valve, Inc.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corp.
e. Crane Co.; Crane Valve Group; Center Line.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Flo Fab Inc.
i. Hammond Valve.
j. Kitz Corporation.
k. Legend Valve.
l. Milwaukee Valve Company.
m. Mueller Steam Specialty; a division of SPX Corporation.
n. NIBCO INC.
o. Norriseal; a Dover Corporation company.
p. Spence Strainers International; a division of CIRCOR International.
q. Sure Flow Equipment Inc.

r. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
s. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: NBR.
f. Stem: One- or two-piece stainless steel.
g. Disc: Nickel-plated ductile iron.

K. 200 CWP, Iron, Single-Flange Butterfly Valves with EPDM Seat and Stainless-Steel Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. American Valve, Inc.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corp.
e. Crane Co.; Crane Valve Group; Jenkins Valves.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Flo Fab Inc.
i. Hammond Valve.
j. Kitz Corporation.
k. Legend Valve.
l. Milwaukee Valve Company.
m. Mueller Steam Specialty; a division of SPX Corporation.
n. NIBCO INC.
o. Norriseal; a Dover Corporation company.
p. Red-White Valve Corporation.
q. Spence Strainers International; a division of CIRCOR International.
r. Sure Flow Equipment Inc.
s. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
t. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.

f. Stem: One- or two-piece stainless steel.
g. Disc: Stainless steel.

L. 200 CWP, Iron, Single-Flange Butterfly Valves with NBR Seat and Stainless-Steel Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. American Valve, Inc.
c. Conbraco Industries, Inc.; Apollo Valves.
d. Cooper Cameron Valves; a division of Cooper Cameron Corp.
e. Crane Co.; Crane Valve Group; Jenkins Valves.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. DeZurik Water Controls.
h. Flo Fab Inc.
i. Hammond Valve.
j. Kitz Corporation.
k. Legend Valve.
l. Milwaukee Valve Company.
m. Mueller Steam Specialty; a division of SPX Corporation.
n. NIBCO INC.
o. Norriseal; a Dover Corporation company.
p. Red-White Valve Corporation.
q. Spence Strainers International; a division of CIRCOR International.
r. Sure Flow Equipment Inc.
s. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
t. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: NBR.
f. Stem: One- or two-piece stainless steel.
g. Disc: Stainless steel.

2.8 IRON, GROOVED-END BUTTERFLY VALVES

A. 175 CWP, Iron, Grooved-End Butterfly Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Kennedy Valve; a division of McWane, Inc.
b. Shurjoint Piping Products.
c. Tyco Fire Products LP; Grinnell Mechanical Products.
d. Victaulic Company.
e. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 175 psig.
c. Body Material: Coated, ductile iron.
d. Stem: Two-piece stainless steel.
e. Disc: Coated, ductile iron.
f. Seal: EPDM.

B. 300 CWP, Iron, Grooved-End Butterfly Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Anvil International, Inc.
b. Kennedy Valve; a division of McWane, Inc.
c. Mueller Steam Specialty; a division of SPX Corporation.
d. NIBCO INC.
e. Shurjoint Piping Products.
f. Tyco Fire Products LP; Grinnell Mechanical Products.
g. Victaulic Company.
h. Or approved equal.

2. Description:

a. Standard: MSS SP-67, Type I.
b. NPS 8 and Smaller CWP Rating: 300 psig.
c. NPS 10 and Larger CWP Rating: 200 psig.
d. Body Material: Coated, ductile iron.
e. Stem: Two-piece stainless steel.
f. Disc: Coated, ductile iron.
g. Seal: EPDM.

2.9 HIGH-PERFORMANCE BUTTERFLY VALVES

A. Class 150, Single-Flange, High-Performance Butterfly Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.

b. Bray Controls; a division of Bray International.
c. Cooper Cameron Valves; a division of Cooper Cameron Corp.
d. Crane Co.; Crane Valve Group; Flowseal.
e. Crane Co.; Crane Valve Group; Stockham Division.
f. DeZurik Water Controls.
g. Hammond Valve.
h. Jamesbury; a subsidiary of Metso Automation.
i. Keystone
j. Milwaukee Valve Company.
k. NIBCO INC.
l. Process Development & Control, Inc.
m. Tyco Valves & Controls; a unit of Tyco Flow Control.
n. Xomox Corporation.
o. Or approved equal.

2. Description:

a. Standard: MSS SP-68.
b. CWP Rating: 285 psig at 100 deg F.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: Carbon steel, cast iron, ductile iron, or stainless steel.
e. Seat: Reinforced PTFE or metal.
f. Stem: Stainless steel; offset from seat plane.
g. Disc: Carbon steel.
h. Service: Bidirectional.

B. Class 300, Single-Flange, High-Performance Butterfly Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABZ Valve and Controls; a division of ABZ Manufacturing, Inc.
b. Bray Controls; a division of Bray International.
c. Cooper Cameron Valves; a division of Cooper Cameron Corp.
d. Crane Co.; Crane Valve Group; Flowseal.
e. Crane Co.; Crane Valve Group; Stockham Division.
f. DeZurik Water Controls.
g. Hammond Valve.
h. Jamesbury; a subsidiary of Metso Automation.
i. Keystone
j. Milwaukee Valve Company.
k. NIBCO INC.
l. Process Development & Control, Inc.
m. Tyco Valves & Controls; a unit of Tyco Flow Control.
n. Xomox Corporation.
o. Or approved equal.

2. Description:

a. Standard: MSS SP-68.
b. CWP Rating: 720 psig at 100 deg F.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: Carbon steel, cast iron, or ductile iron.
e. Seat: Reinforced PTFE or metal.
f. Stem: Stainless steel; offset from seat plane.
g. Disc: Carbon steel.
h. Service: Bidirectional.

2.10 BRONZE LIFT CHECK VALVES

A. Class 125, Lift Check Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Hammond Valve.
e. Kitz Corporation.
f. Milwaukee Valve Company.
g. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 1.
b. CWP Rating: 200 psig.
c. Body Design: Vertical flow.
d. Body Material: ASTM B 61 or ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: Bronze.

B. Class 125, Lift Check Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Hammond Valve.
b. Kitz Corporation.
c. Milwaukee Valve Company.
d. Mueller Steam Specialty; a division of SPX Corporation.
e. NIBCO INC.
f. Red-White Valve Corporation.
g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

h. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 2.
b. CWP Rating: 200 psig.
c. Body Design: Vertical flow.
d. Body Material: ASTM B 61 or ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: NBR, PTFE, or TFE.

2.11 BRONZE SWING CHECK VALVES

A. Class 125, Bronze Swing Check Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Crane Co.; Crane Valve Group; Jenkins Valves.
d. Crane Co.; Crane Valve Group; Stockham Division.
e. Hammond Valve.
f. Kitz Corporation.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Powell Valves.
j. Red-White Valve Corporation.
k. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
l. Zy-Tech Global Industries, Inc.
m. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 3.
b. CWP Rating: 200 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: Bronze.

B. Class 125, Bronze Swing Check Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.

b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Hammond Valve.
e. Kitz Corporation.
f. Milwaukee Valve Company.
g. NIBCO INC.
h. Red-White Valve Corporation.
i. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
j. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 4.
b. CWP Rating: 200 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: PTFE or TFE.

C. Class 150, Bronze Swing Check Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Crane Co.; Crane Valve Group; Jenkins Valves.
d. Crane Co.; Crane Valve Group; Stockham Division.
e. Kitz Corporation.
f. Milwaukee Valve Company.
g. NIBCO INC.
h. Red-White Valve Corporation.
i. Zy-Tech Global Industries, Inc.
j. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 3.
b. CWP Rating: 300 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: Bronze.

D. Class 150, Bronze Swing Check Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Hammond Valve.
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 4.
b. CWP Rating: 300 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: PTFE or TFE.

2.12 IRON SWING CHECK VALVES

A. Class 125, Iron Swing Check Valves with Metal Seats:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Hammond Valve.
e. Kitz Corporation.
f. Legend Valve.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Powell Valves.
j. Red-White Valve Corporation.
k. Sure Flow Equipment Inc.
l. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
m. Zy-Tech Global Industries, Inc.
n. Or approved equal.

2. Description:

a. Standard: MSS SP-71, Type I.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Design: Clear or full waterway.
e. Body Material: ASTM A 126, gray iron with bolted bonnet.
f. Ends: Flanged.

g. Trim: Bronze.
h. Gasket: Asbestos free.

B. Class 125, Iron Swing Check Valves with Nonmetallic-to-Metal Seats:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Stockham Division.
c. Crane Co.; Crane Valve Group; Jenkins Valves.
d. Hammond Valve.
e. Kitz Corporation.
f. Milwaukee Valve Company.
g. Or approved equal.

2. Description:

a. Standard: MSS SP-71, Type I.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Design: Clear or full waterway.
e. Body Material: ASTM A 126, gray iron with bolted bonnet.
f. Ends: Flanged.
g. Trim: Composition.
h. Seat Ring: Bronze.
i. Disc Holder: Bronze.
j. Disc: PTFE or TFE.
k. Gasket: Asbestos free.

C. Class 250, Iron Swing Check Valves with Metal Seats:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Hammond Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
h. Or approved equal.

2. Description:

a. Standard: MSS SP-71, Type I.
b. NPS 2-1/2 to NPS 12, CWP Rating: 500 psig.

c. NPS 14 to NPS 24, CWP Rating: 300 psig.
d. Body Design: Clear or full waterway.
e. Body Material: ASTM A 126, gray iron with bolted bonnet.
f. Ends: Flanged.
g. Trim: Bronze.
h. Gasket: Asbestos free.

2.13 IRON SWING CHECK VALVES WITH CLOSURE CONTROL

A. Class 125, Iron Swing Check Valves with Lever- and Spring-Closure Control:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. NIBCO INC.
b. Hammond Valve.
c. Milwaukee Valve Company.
d. Or approved equal.

2. Description:

a. Standard: MSS SP-71, Type I.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Design: Clear or full waterway.
e. Body Material: ASTM A 126, gray iron with bolted bonnet.
f. Ends: Flanged.
g. Trim: Bronze.
h. Gasket: Asbestos free.
i. Closure Control: Factory-installed, exterior lever and spring.

B. Class 125, Iron Swing Check Valves with Lever and Weight-Closure Control:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Hammond Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
h. Or approved equal.

2. Description:

a. Standard: MSS SP-71, Type I.

b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Design: Clear or full waterway.
e. Body Material: ASTM A 126, gray iron with bolted bonnet.
f. Ends: Flanged.
g. Trim: Bronze.
h. Gasket: Asbestos free.
i. Closure Control: Factory-installed, exterior lever and weight.

2.14 IRON, GROOVED-END SWING CHECK VALVES

A. 300 CWP, Iron, Grooved-End Swing Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Anvil International, Inc.
b. Shurjoint Piping Products.
c. Tyco Fire Products LP; Grinnell Mechanical Products.
d. Victaulic Company.
e. Or approved equal.

2. Description:

a. CWP Rating: 300 psig.
b. Body Material: ASTM A 536, ductile iron.
c. Seal: EPDM.
d. Disc: Spring operated, ductile iron or stainless steel.

2.15 IRON, CENTER-GUIDED CHECK VALVES

A. Class 125, Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Anvil International, Inc.
b. APCO Willamette Valve and Primer Corporation.
c. Crispin Valve.
d. DFT Inc.
e. Flo Fab Inc.
f. GA Industries, Inc.
g. Hammond Valve.
h. Metraflex, Inc.
i. Milwaukee Valve Company.
j. Mueller Steam Specialty; a division of SPX Corporation.

k. NIBCO INC.
l. Spence Strainers International; a division of CIRCOR International.
m. Sure Flow Equipment Inc.
n. Val-Matic Valve & Manufacturing Corp.
o. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
p. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Material: ASTM A 126, gray iron.
e. Style: Compact wafer.
f. Seat: Bronze.

B. Class 125, Iron, Globe, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. DFT Inc.
d. Flomatic Corporation.
e. Hammond Valve.
f. Metraflex, Inc.
g. Milwaukee Valve Company.
h. Mueller Steam Specialty; a division of SPX Corporation.
i. NIBCO INC.
j. Spence Strainers International; a division of CIRCOR International.
k. Sure Flow Equipment Inc.
l. Val-Matic Valve & Manufacturing Corp.
m. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
n. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Material: ASTM A 126, gray iron.
e. Style: Globe, spring loaded.
f. Ends: Flanged.
g. Seat: Bronze.

C. Class 150, Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. APCO Willamette Valve and Primer Corporation.
    b. Crispin Valve.
    c. Val-Matic Valve & Manufacturing Corp.
    d. Or approved equal.

2. Description:

    a. Standard: MSS SP-125.
    b. NPS 2-1/2 to NPS 12, CWP Rating: 300 psig.
    c. NPS 14 to NPS 24, CWP Rating: 250 psig.
    d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
    e. Style: Compact wafer.
    f. Seat: Bronze.

D. Class 150, Iron, Globe, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. APCO Willamette Valve and Primer Corporation.
    b. Crispin Valve.
    c. Val-Matic Valve & Manufacturing Corp.
    d. Or approved equal.

2. Description:

    a. Standard: MSS SP-125.
    b. NPS 2-1/2 to NPS 12, CWP Rating: 300 psig.
    c. NPS 14 to NPS 24, CWP Rating: 250 psig.
    d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
    e. Style: Globe, spring loaded.
    f. Ends: Flanged.
    g. Seat: Bronze.

E. Class 250, Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. APCO Willamette Valve and Primer Corporation.
    b. Crispin Valve.
    c. DFT Inc.
    d. Flo Fab Inc.
    e. Hammond Valve.
    f. Metraflex, Inc.

g. Milwaukee Valve Company.
h. NIBCO INC.
i. Sure Flow Equipment Inc.
j. Val-Matic Valve & Manufacturing Corp.
k. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 400 psig.
c. NPS 14 to NPS 24, CWP Rating: 300 psig.
d. Body Material: ASTM A 126, gray iron.
e. Style: Compact wafer, spring loaded.
f. Seat: Bronze.

F. Class 250, Iron, Globe, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. DFT Inc.
d. Flomatic Corporation.
e. Hammond Valve.
f. Metraflex, Inc.
g. Milwaukee Valve Company.
h. Mueller Steam Specialty; a division of SPX Corporation.
i. NIBCO INC.
j. Val-Matic Valve & Manufacturing Corp.
k. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 400 psig.
c. NPS 14 to NPS 24, CWP Rating: 300 psig.
d. Body Material: ASTM A 126, gray iron.
e. Style: Globe, spring loaded.
f. Ends: Flanged.
g. Seat: Bronze.

G. Class 300, Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following.
a. Crispin Valve.
b. Val-Matic Valve & Manufacturing Corp.

c. NIBCO INC.
d. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 500 psig.
c. NPS 14 to NPS 24, CWP Rating: 400 psig.
d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
e. Style: Compact wafer, spring loaded.
f. Seat: Bronze.

H. Class 300, Iron, Globe, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. Val-Matic Valve & Manufacturing Corp.
d. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 500 psig.
c. NPS 14 to NPS 24, CWP Rating: 400 psig.
d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
e. Style: Globe, spring loaded.
f. Ends: Flanged.
g. Seat: Bronze.

I. Class 125, Iron, Compact-Wafer, Center-Guided Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. DFT Inc.
d. Flo Fab Inc.
e. Hammond Valve.
f. Milwaukee Valve Company.
g. NIBCO INC.
h. Spence Strainers International; a division of CIRCOR International.
i. Sure Flow Equipment Inc.
j. Val-Matic Valve & Manufacturing Corp.
k. Or approved equal.

2. Description:

   a. Standard: MSS SP-125.
   b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
   c. NPS 14 to NPS 24, CWP Rating: 150 psig.
   d. Body Material: ASTM A 126, gray iron.
   e. Style: Compact wafer.
   f. Seat: EPDM.

J. Class 125, Iron, Globe, Center-Guided Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Anvil International, Inc.
   b. APCO Willamette Valve and Primer Corporation.
   c. Crispin Valve.
   d. DFT Inc.
   e. GA Industries, Inc.
   f. Hammond Valve.
   g. Milwaukee Valve Company.
   h. NIBCO INC.
   i. Sure Flow Equipment Inc.
   j. Val-Matic Valve & Manufacturing Corp.
   k. Or approved equal.

2. Description:

   a. Standard: MSS SP-125.
   b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
   c. NPS 14 to NPS 24, CWP Rating: 150 psig.
   d. Body Material: ASTM A 126, gray iron.
   e. Style: Globe, spring loaded.
   f. Ends: Flanged.
   g. Seat: EPDM.

K. Class 150, Iron, Compact-Wafer, Center-Guided Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. APCO Willamette Valve and Primer Corporation.
   b. Crispin Valve.
   c. Val-Matic Valve & Manufacturing Corp.
   d. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 300 psig.
c. NPS 14 to NPS 24, CWP Rating: 250 psig.
d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
e. Style: Compact wafer.
f. Seat: EPDM.

L. Class 150, Iron, Globe, Center-Guided Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. DFT Inc.
d. Val-Matic Valve & Manufacturing Corp.
e. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 300 psig.
c. NPS 14 to NPS 24, CWP Rating: 250 psig.
d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
e. Style: Globe, spring loaded.
f. Ends: Flanged.
g. Seat: EPDM.

M. Class 250, Iron, Compact-Wafer, Center-Guided Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. DFT Inc.
d. Hammond Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Sure Flow Equipment Inc.
h. Val-Matic Valve & Manufacturing Corp.
i. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 400 psig.

c. NPS 14 to NPS 24, CWP Rating: 300 psig.
d. Body Material: ASTM A 126, gray iron.
e. Style: Compact wafer, spring loaded.
f. Seat: EPDM.

N. Class 250, Iron, Globe, Center-Guided Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. DFT Inc.
d. Hammond Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Val-Matic Valve & Manufacturing Corp.
h. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 400 psig.
c. NPS 14 to NPS 24, CWP Rating: 300 psig.
d. Body Material: ASTM A 126, gray iron.
e. Style: Globe, spring loaded.
f. Ends: Flanged.
g. Seat: EPDM.

O. Class 300, Iron, Compact-Wafer, Center-Guided Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crispin Valve.
c. Val-Matic Valve & Manufacturing Corp.
d. Or approved equal.

2. Description:

a. Standard: MSS SP-125.
b. NPS 2-1/2 to NPS 12, CWP Rating: 500 psig.
c. NPS 14 to NPS 24, CWP Rating: 400 psig.
d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
e. Style: Compact wafer, spring loaded.
f. Seat: EPDM.

P. Class 300, Iron, Globe, Center-Guided Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. APCO Willamette Valve and Primer Corporation.
   b. Crispin Valve.
   c. Val-Matic Valve & Manufacturing Corp.
   d. Or approved equal.

2. Description:

   a. Standard: MSS SP-125.
   b. NPS 2-1/2 to NPS 12, CWP Rating: 500 psig.
   c. NPS 14 to NPS 24, CWP Rating: 400 psig.
   d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
   e. Style: Globe, spring loaded.
   f. Ends: Flanged.
   g. Seat: EPDM.

2.16 IRON, PLATE-TYPE CHECK VALVES

A. Class 125, Iron, Dual-Plate Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. APCO Willamette Valve and Primer Corporation.
   b. Crane Co.; Crane Valve Group; Crane Valves.
   c. Flomatic Corporation.
   d. Mueller Steam Specialty; a division of SPX Corporation.
   e. Or approved equal.

2. Description:

   a. Standard: API 594.
   b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
   c. NPS 14 to NPS 24, CWP Rating: 150 psig.
   d. Body Design: Wafer, spring-loaded plates.
   e. Body Material: ASTM A 126, gray iron.
   f. Seat: Bronze.

B. Class 150, Iron, Dual-Plate Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. APCO Willamette Valve and Primer Corporation.

b. Crane Co.; Crane Valve Group; Crane Valves.
c. Mueller Steam Specialty; a division of SPX Corporation.
d. Val-Matic Valve & Manufacturing Corp.
e. Or approved equal.

2. Description:

a. Standard: API 594.
b. NPS 2-1/2 to NPS 12, CWP Rating: 300 psig.
c. NPS 14 to NPS 24, CWP Rating: 250 psig.
d. Body Design: Wafer, spring-loaded plates.
e. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
f. Seat: Bronze.

C. Class 250, Iron, Dual-Plate Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Val-Matic Valve & Manufacturing Corp.
d. Or approved equal.

2. Description:

a. Standard: API 594.
b. NPS 2-1/2 to NPS 12, CWP Rating: 400 psig.
c. NPS 14 to NPS 24, CWP Rating: 300 psig.
d. Body Design: Wafer, spring-loaded plates.
e. Body Material: ASTM A 126, gray iron.
f. Seat: Bronze.

D. Class 300, Iron, Dual-Plate Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Mueller Steam Specialty; a division of SPX Corporation.
d. Val-Matic Valve & Manufacturing Corp.
e. Or approved equal.

2. Description:

a. Standard: API 594.
b. NPS 2-1/2 to NPS 12, CWP Rating: 500 psig.

c. NPS 14 to NPS 24, CWP Rating: 400 psig.
d. Body Design: Wafer, spring-loaded plates.
e. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
f. Seat: Bronze.

E. Class 125, Iron, Single-Plate Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Flo Fab Inc.
b. Sure Flow Equipment Inc.
c. NIBCO INC.
d. Or approved equal.

2. Description:

a. Standard: API 594.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Design: Wafer, spring-loaded plate.
e. Body Material: ASTM A 126, gray iron.
f. Seat: EPDM.

F. Class 125, Iron, Dual-Plate Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Cooper Cameron Valves TVB Techno.
c. Crane Co.; Crane Valve Group; Crane Valves.
d. Crane Co.; Crane Valve Group; Stockham Division.
e. NIBCO INC.
f. Spence Strainers International; a division of CIRCOR International.
g. Sure Flow Equipment Inc.
h. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
i. Or approved equal.

2. Description:

a. Standard: API 594.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Design: Wafer, spring-loaded plates.
e. Body Material: ASTM A 126, gray iron.
f. Seat: EPDM.

G. Class 150, Iron, Dual-Plate Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. APCO Willamette Valve and Primer Corporation.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Crane Co.; Crane Valve Group; Jenkins Valves.
d. Val-Matic Valve & Manufacturing Corp.
e. Or approved equal.

2. Description:

a. Standard: API 594.
b. NPS 2-1/2 to NPS 12, CWP Rating: 300 psig.
c. NPS 14 to NPS 24, CWP Rating: 250 psig.
d. Body Design: Wafer, spring-loaded plates.
e. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
f. Seat: EPDM.

2.17 BRONZE GATE VALVES

A. Class 125, NRS Bronze Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Crane Co.; Crane Valve Group; Jenkins Valves.
d. Crane Co.; Crane Valve Group; Stockham Division.
e. Hammond Valve.
f. Kitz Corporation.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Powell Valves.
j. Red-White Valve Corporation.
k. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
l. Zy-Tech Global Industries, Inc.
m. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 1.
b. CWP Rating: 200 psig.
c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded.

e. Stem: Bronze.
f. Disc: Solid wedge; bronze.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron.

B. Class 125, RS Bronze Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Crane Co.; Crane Valve Group; Jenkins Valves.
d. Crane Co.; Crane Valve Group; Stockham Division.
e. Hammond Valve.
f. Kitz Corporation.
g. Milwaukee Valve Company.
h. NIBCO INC.
i. Powell Valves.
j. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
k. Zy-Tech Global Industries, Inc.
l. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 2.
b. CWP Rating: 200 psig.
c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded.
e. Stem: Bronze.
f. Disc: Solid wedge; bronze.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron.

C. Class 150, NRS Bronze Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hammond Valve.
b. Kitz Corporation.
c. Milwaukee Valve Company.
d. NIBCO INC.
e. Powell Valves.
f. Red-White Valve Corporation.
g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
h. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 1.
b. CWP Rating: 300 psig.
c. Body Material: ASTM B 62, bronze with integral seat and union-ring bonnet.
d. Ends: Threaded.
e. Stem: Bronze.
f. Disc: Solid wedge; bronze.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron.

D. Class 150, RS Bronze Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Stockham Division.
c. Hammond Valve.
d. Kitz Corporation.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Powell Valves.
h. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
i. Zy-Tech Global Industries, Inc.
j. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 2.
b. CWP Rating: 300 psig.
c. Body Material: ASTM B 62, bronze with integral seat and union-ring bonnet.
d. Ends: Threaded.
e. Stem: Bronze.
f. Disc: Solid wedge; bronze.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron.

2.18 IRON GATE VALVES

A. Class 125, NRS, Iron Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.

b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Flo Fab Inc.
e. Hammond Valve.
f. Kitz Corporation.
g. Legend Valve.
h. Milwaukee Valve Company.
i. NIBCO INC.
j. Powell Valves.
k. Red-White Valve Corporation.
l. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
m. Zy-Tech Global Industries, Inc.
n. Or approved equal.

2. Description:

a. Standard: MSS SP-70, Type I.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged.
f. Trim: Bronze.
g. Disc: Solid wedge.
h. Packing and Gasket: Asbestos free.

B. Class 125, OS&Y, Iron Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Flo Fab Inc.
e. Hammond Valve.
f. Kitz Corporation.
g. Legend Valve.
h. Milwaukee Valve Company.
i. NIBCO INC.
j. Powell Valves.
k. Red-White Valve Corporation.
l. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
m. Zy-Tech Global Industries, Inc.
n. Or approved equal.

2. Description:

a. Standard: MSS SP-70, Type I.

b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged.
f. Trim: Bronze.
g. Disc: Solid wedge.
h. Packing and Gasket: Asbestos free.

C. Class 250, NRS, Iron Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Stockham Division.
c. NIBCO INC.
d. Hammond Valve.
e. Kitz Corporation.
f. Milwaukee Valve Company.
g. Or approved equal.

2. Description:

a. Standard: MSS SP-70, Type I.
b. NPS 2-1/2 to NPS 12, CWP Rating: 500 psig.
c. NPS 14 to NPS 24, CWP Rating: 300 psig.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged.
f. Trim: Bronze.
g. Disc: Solid wedge.
h. Packing and Gasket: Asbestos free.

D. Class 250, OS&Y, Iron Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Stockham Division.
c. Hammond Valve.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. Powell Valves.
g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
h. Or approved equal.

2. Description:

a. Standard: MSS SP-70, Type I.
b. NPS 2-1/2 to NPS 12, CWP Rating: 500 psig.
c. NPS 14 to NPS 24, CWP Rating: 300 psig.
d. Body Material: ASTM A 126, gray iron with bolted bonnet.
e. Ends: Flanged.
f. Trim: Bronze.
g. Disc: Solid wedge.
h. Packing and Gasket: Asbestos free.

2.19 BRONZE GLOBE VALVES

A. Class 125, Bronze Globe Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Stockham Division.
c. Hammond Valve.
d. Kitz Corporation.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Powell Valves.
h. Red-White Valve Corporation.
i. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
j. Zy-Tech Global Industries, Inc.
k. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 1.
b. CWP Rating: 200 psig.
c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded.
e. Stem and Disc: Bronze.
f. Packing: Asbestos free.
g. Handwheel: Malleable iron.

B. Class 125, Bronze Globe Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Stockham Division.
c. NIBCO INC.
d. Red-White Valve Corporation.

e. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 2.
b. CWP Rating: 200 psig.
c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded.
e. Stem: Bronze.
f. Disc: PTFE or TFE.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron.

C. Class 150, Bronze Globe Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Hammond Valve.
c. Kitz Corporation.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. Powell Valves.
g. Red-White Valve Corporation.
h. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
i. Zy-Tech Global Industries, Inc.
j. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 2.
b. CWP Rating: 300 psig.
c. Body Material: ASTM B 62, bronze with integral seat and union-ring bonnet.
d. Ends: Threaded.
e. Stem: Bronze.
f. Disc: PTFE or TFE.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron.

2.20 IRON GLOBE VALVES

A. Class 125, Iron Globe Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Hammond Valve.
e. Kitz Corporation.
f. Milwaukee Valve Company.
g. NIBCO INC.
h. Powell Valves.
i. Red-White Valve Corporation.
j. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
k. Zy-Tech Global Industries, Inc.
l. Or approved equal.

2. Description:

a. Standard: MSS SP-85, Type I.
b. CWP Rating: 200 psig.
c. Body Material: ASTM A 126, gray iron with bolted bonnet.
d. Ends: Flanged.
e. Trim: Bronze.
f. Packing and Gasket: Asbestos free.

B. Class 250, Iron Globe Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Hammond Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
h. Or approved equal.

2. Description:

a. Standard: MSS SP-85, Type I.
b. CWP Rating: 500 psig.
c. Body Material: ASTM A 126, gray iron with bolted bonnet.
d. Ends: Flanged.
e. Trim: Bronze.
f. Packing and Gasket: Asbestos free.

2.21 LUBRICATED PLUG VALVES

A. Class 125, Regular-Gland, Lubricated Plug Valves with Threaded Ends:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Nordstrom Valves, Inc.
b. Homestead Valve; a division of Olson Technologies, Inc.
c. Milliken Valve Company.
d. R & M Energy Systems; a unit of Robbins & Myers, Inc.
e. Or approved equal.

2. Description:

a. Standard: MSS SP-78, Type II.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Material: ASTM A 48/A 48M or ASTM A 126, cast iron with lubrication-sealing system.
e. Pattern: Regular.
f. Plug: Cast iron or bronze with sealant groove.

B. Class 125, Regular-Gland, Lubricated Plug Valves with Flanged Ends:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Nordstrom Valves, Inc.
b. Homestead Valve; a division of Olson Technologies, Inc.
c. Milliken Valve Company.
d. R & M Energy Systems; a unit of Robbins & Myers, Inc.
e. Or approved equal.

2. Description:

a. Standard: MSS SP-78, Type II.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Material: ASTM A 48/A 48M or ASTM A 126, cast iron with lubrication-sealing system.
e. Pattern: Regular.
f. Plug: Cast iron or bronze with sealant groove.

C. Class 125, Cylindrical, Lubricated Plug Valves with Threaded Ends:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Homestead Valve; a division of Olson Technologies, Inc.
b. Milliken Valve Company.
c. R & M Energy Systems; a unit of Robbins & Myers, Inc.
d. Or approved equal.

2. Description:

a. Standard: MSS SP-78, Type IV.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Material: ASTM A 48/A 48M or ASTM A 126, cast iron with lubrication-sealing system.
e. Pattern: Regular.
f. Plug: Cast iron or bronze with sealant groove.

D. Class 125, Cylindrical, Lubricated Plug Valves with Flanged Ends:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Homestead Valve; a division of Olson Technologies, Inc.
b. Milliken Valve Company.
c. R & M Energy Systems; a unit of Robbins & Myers, Inc.
d. Or approved equal.

2. Description:

a. Standard: MSS SP-78, Type IV.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. NPS 14 to NPS 24, CWP Rating: 150 psig.
d. Body Material: ASTM A 48/A 48M or ASTM A 126, cast iron with lubrication-sealing system.
e. Pattern: Regular.
f. Plug: Cast iron or bronze with sealant groove.

2.22 ECCENTRIC PLUG VALVES

A. 175 CWP, Eccentric Plug Valves with Resilient Seating.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Clow Valve Co.; a division of McWane, Inc.
b. DeZurik Water Controls.
c. Homestead Valve; a division of Olson Technologies, Inc.
d. M&H Valve Company; a division of McWane, Inc.

e. Milliken Valve Company.
f. Henry Pratt Company.
g. Val-Matic Valve & Manufacturing Corp.
h. Or approved equal.

2. Description:

a. Standard: MSS SP-108.
b. CWP Rating: 175 psig minimum.
c. Body and Plug: ASTM A 48/A 48M, gray iron; ASTM A 126, gray iron; or ASTM A 536, ductile iron.
d. Bearings: Oil-impregnated bronze or stainless steel.
e. Ends: Flanged.
f. Stem-Seal Packing: Asbestos free.
g. Plug, Resilient-Seating Material: Suitable for potable-water service unless otherwise indicated.

2.23 CHAINWHEELS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Babbitt Steam Specialty Co.
2. Roto Hammer Industries.
3. Trumbull Industries.
4. Or approved equal.

B. Description: Valve actuation assembly with sprocket rim, brackets, and chain.

1. Brackets: Type, number, size, and fasteners required to mount actuator on valve.
2. Attachment: For connection to ball butterfly and plug valve stems.
3. Sprocket Rim with Chain Guides: Ductile iron type and size required for valve with Include zinc coating.
4. Chain: Hot-dip galvanized of size required to fit sprocket rim.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

C. Examine threads on valve and mating pipe for form and cleanliness.

D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

E. Do not attempt to repair defective valves; replace with new valves.

3.3 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.

E. Install chainwheels on operators for ball butterfly gate globe and plug valves NPS 4 and larger and more than 96 inches above floor. Extend chains to 60 inches above finished floor.

F. Install check valves for proper direction of flow and as follows:

1. Swing Check Valves: In horizontal position with hinge pin level.
2. Center-Guided and Plate-Type Check Valves: In horizontal or vertical position, between flanges.
3. Lift Check Valves: With stem upright and plumb.

3.4 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.

3.5 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. For valve applications, use the following:

1. Shutoff Service: gate valves.
2. Butterfly Valve Dead-End Service: Single-flange (lug) type.
3. Throttling Service except Steam: Globe valves.
4. Throttling Service, Steam: Globe or angle valves.
5. Pump-Discharge Check Valves:

    a. NPS 2 and Smaller: Bronze swing check valves with bronze disc.
    b. NPS 2-1/2 and Larger: Iron swing check valves with lever and weight or with spring or iron, center-guided, metal or resilient-seat check valves.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.

C. Select valves, except wafer types, with the following end connections:

1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
3. For Copper Tubing, NPS 5 and Larger: Flanged ends.
4. For Steel Piping, NPS 2 and Smaller: Threaded ends.
5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
6. For Steel Piping, NPS 5 and Larger: Flanged ends.

3.6 CHILLED-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:

1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
2. Bronze Angle Valves: Class 150, bronze disc.
3. Ball Valves: Three piece, full port, bronze with bronnze trim.
4. Bronze Swing Check Valves:Class 150, bronze disc.
5. Bronze Gate Valves: Class 150, bronze.
6. Bronze Globe Valves: Class 150 bronze disc.

B. Pipe NPS 2-1/2 and Larger:

1. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
2. Iron Ball Valves, NPS 2-1/2 to NPS 10: Class 150.
3. Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 12: 200 CWP, EPDM seat, aluminum-bronze ductile-iron disc.
4. Iron, Single-Flange Butterfly Valves, NPS 14 to NPS 24: 150 CWP, EPDM seat,ductile-iron disc.
5. Iron, Grooved-End Butterfly Valves, NPS 2-1/2 to NPS 12: 175 CWP.

6. High-Performance Butterfly Valves: Class 150, single flange.
7. Iron Swing Check Valves: Class 125 metal seats.
8. Iron Swing Check Valves with Closure Control, NPS 2-1/2 to NPS 12: Class 125, lever and spring.
9. Iron, Center-Guided Check Valves: Class 150, compact-wafer globe, metal seat.
10. Iron, Plate-Type Check Valves: Class 150 single plate; metal resilient seat.
11. Iron Gate Valves: Class 250, NRS OS&Y.
12. Iron Globe Valves: Class 125.
13. Lubricated Plug Valves: Class.
14. Eccentric Plug Valves: 175 CWP, resilient seating.

END OF SECTION 23 05 23

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. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Fiberglass pipe hangers.
4. Metal framing systems.
5. Fiberglass strut systems.
6. Thermal-hanger shield inserts.
7. Fastener systems.
8. Pipe stands.
9. Equipment supports.

B. Related Sections:
1. Section 233113 "Metal Ducts" for duct hangers and supports.

1.3 DEFINITIONS

A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

A. Structured Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer licensed in the State of New York, using performance requirements and design criteria indicated.

B. Structural Performance: Hangers and supports for HVAC piping and equipment must withstand the effects of gravity loads and stresses within limits and under conditions indicated according to (ASCE/SEI 7)

1. Design supports for multiple pipes, including pipe stands, 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.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.6 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: (Signed and sealed by a qualified professional engineer licensed in the State of New York.) Show fabrication and installation details and include calculations for the following: include Product Data for components:

1. Trapeze pipe hangers.
2. Metal framing systems.
3. Pipe stands.
4. Equipment supports.

C. Engineering Services Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer licensed in the State of New York responsible for their preparation.

1. Detail fabrication and assembly of trapeze hangers.
2. Design Calculations: Calculate requirements for designing trapeze hangers.

D. Welding certificates.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “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.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Galvanized Metallic Coatings: hot dipped.
3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

2.2 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Allied Tube & Conduit.
    b. Cooper B-Line, Inc.
    c. Flex-Strut Inc.
    d. GS Metals Corp.
    e. Thomas & Betts Corporation.
    f. Unistrut Corporation; Tyco International, Ltd.
    g. Wesanco, Inc.
    h. Or approved equal.

2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
3. Standard: MFMA-4.
4. Channels: Continuous slotted steel channel with inturned lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
7. Metallic Coating: Hot-dipped galvanized.
8. Paint Coating: Vinyl.
9. Plastic Coating: PVC.

B. Non-MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Anvil International; a subsidiary of Mueller Water Products Inc.

b. Empire Industries, Inc.
c. ERICO International Corporation.
d. Haydon Corporation; H-Strut Division.
e. NIBCO INC.
f. PHD Manufacturing, Inc.
g. PHS Industries, Inc.
h. Or approved equal.

2. Description: Shop- or field-fabricated pipe-support assembly made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
3. Standard: Comply with MFMA-4.
4. Channels: Continuous slotted steel channel with in-turned lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
7. Coating: hot dip galvanized.

2.4 THERMAL-HANGER SHIELD INSERTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following;

1. Carpenter & Paterson, Inc.
2. Clement Support Services.
3. ERICO International Corporation.
4. National Pipe Hanger Corporation.
5. PHS Industries, Inc.
6. Pipe Shields, Inc.; a subsidiary of Piping Technology & Products, Inc.
7. Piping Technology & Products, Inc.
8. Rilco Manufacturing Co., Inc.
9. Value Engineered Products, Inc.
10. Or approved equal.

B. Insulation-Insert Material for Cold Piping: STM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength and vapor barrier.

C. Insulation-Insert Material for Hot Piping: ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength.

D. For Trapeze or Clamped Systems: Insert and shield must cover entire circumference of pipe.

E. For Clevis or Band Hangers: Insert and shield must cover lower 180 degrees of pipe.

F. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.5 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type, 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.

2.6 PIPE STANDS

A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.

B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.

C. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.

D. High-Type, Single-Pipe Stand:

1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
2. Base: plastic.
3. Vertical Members: Two or more cadmium-plated-steel, continuous-thread rods.
4. Horizontal Member: Cadmium-plated-steel rod with plastic, roller-type pipe support.

E. High-Type, Multiple-Pipe Stand:

1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
2. Bases: One or more; plastic.
3. Vertical Members: Two or more protective-coated-steel channels.
4. Horizontal Member: Protective-coated-steel channel.
5. Pipe Supports: hot dip galvanized-steel, clevis-type pipe hangers.

F. Curb-Mounted-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.7 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.8 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. Metal 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 the building structure.

B. Metal 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 for individual pipe hangers.
2. Field fabricates from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

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 pipe hanger or shield for insulated piping.

E. 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 the manufacturer’s written instructions.

F. Pipe Stand Installation:

1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount them on smooth roof surface. Do not penetrate roof membrane.
2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb.

G. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

H. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

I. 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.

J. Install lateral bracing with pipe hangers and supports to prevent swaying.

K. 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.

L. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

M. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

N. Insulated Piping:

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 allowed by 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.

    a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.

3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields must span an arc of 180 degrees.

4. Shield Dimensions for Pipe: Not less than the following:

   a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
   b. NPS 4: 12 inches long and 0.06 inch thick.
   c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
   d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
   e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.

5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

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 undercutting 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 1-1/2 inches.

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. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.7 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are 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 carbon-steel pipe hangers and supports, metal trapeze pipe hangers and metal framing systems and attachments for general service applications.

F. Use padded hangers for piping that is subject to scratching.

G. Use thermal-hanger shield inserts for insulated piping and tubing.

H. 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 noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.
3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.
4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
5. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.

7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
8. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
10. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
11. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
12. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
14. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.
17. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2-1/2 to NPS 24, from single rod if horizontal movement caused by expansion and contraction might occur.
19. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.

I. 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 24.
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.

J. 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 for heavy loads.

2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.

K. 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. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:

    a. Light (MSS Type 31): 750 lb.
    b. Medium (MSS Type 32): 1500 lb.
    c. Heavy (MSS Type 33): 3000 lb.

13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

L. 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.

M. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:

    a. Horizontal (MSS Type 54): Mounted horizontally.
    b. Vertical (MSS Type 55): Mounted vertically.
    c. Trapeze (MSS Type 56): Two vertical type supports and one trapeze member.

N. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

O. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

P. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION 23 05 29

SECTION 23 05 48.13 - VIBRATION CONTROLS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. The Division 23 Subcontractor must assume complete responsibility for the anchoring of the equipment, piping systems, etc., specified herein to the concrete foundation pads, to the concrete inertia bases and to the supporting structural steel and concrete beams.

B. Furnish and install foundation vibration isolation and associated equipment for piping, rotating equipment, etc., as specified herein.

C. This section includes the following:
   1. All outdoor equipment, including roof-mounted components, must comply with section 1609, Wind Load, IBC-2018. There must be no decrease of the effects of wind load on a component due to other structures or components acting as blocks or screens.
   2. All below, at grade or above grade locations located in a flood hazard area as defined and located herein.
   3. Wind and flood load and isolation materials must be the certified products of the same manufacturing group and must be certified by that group.
   4. It is the intent of the wind load portion of this specification to keep all mechanical, building system components in place during high wind event and additionally operational.
   5. All such systems must be installed in strict accordance with component manufacturer's and NYC Building Code.
   6. This specification is considered to be minimum requirements for wind, flood and vibration control considerations.
   7. Any variation, which results in non-compliancewith the specification requirements, must be corrected by the subcontractor in an approved manner.

D. The Division 23 Subcontractor must provide all miscellaneous steel for support of equipment, piping and ductwork systems.

E. Section Includes:

   1. Elastomeric isolation pads.
   2. Elastomeric isolation mounts.
   3. Restrained elastomeric isolation mounts.

4. Open-spring isolators.
5. Housed-spring isolators.
6. Restrained-spring isolators.
7. Housed-restrained-spring isolators.
8. Pipe-riser resilient supports.
9. Resilient pipe guides.
10. Air-spring isolators.
11. Restrained-air-spring isolators.
12. Elastomeric hangers.
13. Spring hangers.
14. Vibration isolation equipment bases.
15. Restrained isolation roof-curb rails.

F. Related Requirements:

1. All equipment and material to be furnished and installed on this project must be in accordance with the requirements of the NYC Building Code and suitable for its intended use on.
2. All vibration isolation devices and components must be designed, manufactured and tested in accordance with the latest applicable standards.

1.3 DEFINITIONS

A. Basic Wind Speed: The basic wind speed, in mph, for determination of the wind loads must be as per Section 1609 (IBC-2018). Section 6.5.4 of ASCE 7-05 must be used after determination of basic wind speed. See Section 1609.3 ASCE 7-05 for basic wind speed determination in non-hurricane prone regions.

B. Flood or Flooding: A general and temporary condition or partial and complete inundation of normally dry land from:
1. The overflow of inland or tidal waters.
2. The unusual and rapid accumulation of runoff of surface waters from any source.

C. Flood Hazard Area: The greater of the following of two areas:
1. The area within a flood plain subject to a 1 percent or greater chance of flooding in any year.
2. The area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated.

D. Special Flood Hazard Area Subject to High Velocity Wave Action: Area within the flood hazard area that is subject to high velocity wave action and shown on a Flood Insurance Rate Map (FIRM) or another flood hazard map as zone V, VO, VE or VI-30.

E. Flood Insurance Rate Map (FIRM): An official map of a community on which the Federal Emergency Management Agency (FEMA) has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

F. Hurricane Prone Regions: Areas prone to hurricanes include the U.S. Atlantic Ocean, Gulf Coasts, Hawaii, Puerto Rico, Guam, Virgin Islands, and American Samoa where the wind speed is greater than 90 mph.

1.4 GENERAL DESIGN AND PERFORMANCE

A. General Design Requirements.
   1. Wind Considerations: This project has wind design requirements as follows:
      a. Wind load in hurricane, tornado and/or wind-borne debris regions (90 plus mph) having a building height greater than 60 feet. Rooftop structures; Section 6.5.15.1 of ASCE 7-05 design requirements apply)

B. General Design Performance Requirements
   1. Attachment calculations by the Restraint Manufacturer's NYS licensed Engineer substantiating the mounting system or wind restraints, fasteners or ICC Certified Concrete Anchors must be submitted for approval along with the shop drawings. Wind loads must have their calculations based on Section 1.4, Paragraph B, article 8, Design Wind Loads.
   2. Design Wind Loads:
      a. All outdoor mounted components must be positively fastened to their supporting structure as discussed below. Fastening to metal deck is unacceptable.
         1) Components that are curb mounted, article 7, Design Seismic Loads, must be followed for all roof-mounted components in excess of 9 sq. ft. in cross-sectional area. Curbs must be as described in Base type B-3 if isolated, Base type B-4 if non- isolated.
         2) Components that are support mounted, article 7, Design Seismic Loads, must be followed for all roof-mounted components requiring waterproofed rail supports. Equipment support must be Base type B-5 if isolated, Base type B-6 if non- isolated.
         3) Equipment that is dunnage mounted, positive attachment must occur through welding or bolting of equipment to dunnage steel.
      b. Loads and calculations must be based on IBC-2006, figure 1609 and related sections in ASCE 7-05.
      c. Where buildings are less than or equal to 60 feet in height to the top of the roof slab (not parapet walls), the force on roof-mounted components must be based on Section 6.5.15.1, ASCE 7-05.
      d. Equivalent basic wind speed must be based on IBC-2006, Table 1609.3.1.
         In no event must adjacent buildings, structures or screens be considered to diminish the calculated wind load or its effect on an outdoor component.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions. Section 013300 "Submittal Procedures."

1.6 SUBMITTALS

A. Product Data: For each type of product.

1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of vibration isolation device type required.

B. Shop Drawings:
1. The Mechanical Subcontractor must submit isolation Shop Drawings for all horizontal and vertical piping, equipment inertia bases, mechanical equipment and cooling towers to the Commissioner prior to fabrication and installation of any of the isolation and restraint equipment of systems.
2. Submittal data must include certification by the vibration isolation manufacturer that all heating hot water and steam piping systems for both horizontal and vertical piping have been examined for excessive stresses and that none will exist in the proposed design.
3. Piping shop drawings must indicate the anticipated expansion and contraction of all piping systems at each support point, initial and final loads on the building structure, spring deflection changes, construction loading, normal operating condition loading and the structural loading, which will occur during expansion and contraction.
4. Each device must have a permanently attached identification tag which is cross referenced to the diagrams by location and service.
5. Detail fabrication and assembly of equipment bases must include anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
6. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

C. Engineering Services Submittal: For each vibration isolation device.

1. Include design calculations for selecting vibration isolators and for designing vibration isolation bases.

D. Coordination Drawings: Show coordination of vibration isolation device installation for HVAC piping and equipment with other systems and equipment in the vicinity, including other supports and restraints, if any.

E. Qualification Data: For testing agency.

F. Welding certificates.

G. Air-Mounting System Performance Certification: Include natural frequency, load, and damping test data.

H. Operation and Maintenance Data: For air-spring mounts to include in operation and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATION

A. Springs: All springs must have a minimum additional travel to solid equal to 50% of the rated deflection. All springs except internal nested springs must have an outside diameter not less than 0.8 of the compressed height of the spring. Ends of springs must be square and ground for stability. Laterally stable springs must have k_x/k_y ratios of at least 0.9. All springs must be fully color-coded to indicate capacity – color striping is not considered adequate.

B. Corrosion Protection: All springs must be powder-coated enamel. Housings must be galvanized, powder-coated enamel, or painted with rust-resistant paint. Hot-dipped galvanized housing must be provided as indicated on the Schedule.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Mason Industries, Inc.
2. Kinetics Noise Control, Inc.
3. Vibration Eliminator Co., Inc.
4. Vibration Mountings & Controls, Inc.
5. Or approved equal.

2.3 ELASTOMERIC ISOLATION PADS

A. Elastomeric Isolation Pads - Type A:

1. Fabrication: Single or multiple layers of sufficient durometer stiffness for uniform loading over pad area.
2. Size: Factory or field cut to match requirements of supported equipment.

3. Pad Material: Neoprene.
4. Surface Pattern: Waffle pattern.
5. Load-bearing metal plates adhered to pads.
6. 0.75” minimum thickness.
7. 50 PSI maximum loading.
8. 1/16” galvanized steel plate between multiple layers of pad thickness.
9. ¼” thick friction pad. Through Hole with Resilient washer.

B. Elastomeric Isolation Mounts - Type B
1. Neoprene mountings must have a minimum static deflection of 0.35"(9mm). All metal surfaces must be neoprene covered and have friction pads both top and bottom.
2. Bolt holes must be provided on the bottom and a tapped hole and cap screw on top.
3. Steel rails must be used above the mountings under equipment such as small vent sets to compensate for the overhang.

C. Elastomeric Isolation mounts – Type C
1. Pad type elastomer mountings to incorporate the following:
   a. Minimum thickness, 1/2" (12 mm).
   b. Maximum loading 1000 psi (6900 KN/m2).
   c. Laminated canvas duck and neoprene.
   d. Suitable bearing plate to distribute load.

D. Elastomeric Isolation Mount – Type D
1. Molded unit type neoprene element with projecting bushing lining rod clearance hole.
2. Neoprene element to be minimum 1 3/4" (45 mm) thick.
3. Steel retainer box encasing neoprene mounting.
4. Clearance between mounting hanger rod and neoprene bushing must be minimum 1/8".

2.4 OPEN-SPRING ISOLATORS - Type E

A. Open Spring Isolators:
1. Spring isolators must be free standing and laterally stable without any housing and complete with a molded neoprene cup or 1/4"(6mm) neoprene acoustical friction pad between the baseplate and the support.
2. All mountings must have levelled bolts that must be rigidly bolted to the equipment.
3. Installed and operating heights must be equal.
4. The ratio of the spring diameter divided by the compressed spring height must be no less than 0.8. Springs must have a minimum additional travel to solid equal to 50% of the rated deflection.
5. All air ducts with a cross section of 2ft2 or larger must be isolated from the building structure by Type C floor supports with a minimum deflection of 0.75". Isolators must continue for 50' from the equipment.
6. Submittals must include spring diameters, deflection, compressed spring height and solid spring height.

2.5 RESTRAINED-SPRING ISOLATORS

A. Restrained spring isolators - Type F
   1. Must be free standing and laterally stable without any housing and complete with a molded neoprene cup or 1/4"(6mm) neoprene acoustical friction pad between the baseplate and the support.
   2. All mountings must have levelled bolts that must be rigidly bolted to the equipment. Installed and operating heights must be equal.
   3. Neoprene acoustical pad within a rigid sided housing that includes vertical limit stops to prevent spring extension when weight is removed and temporary steel spacers between the upper and lower housings.
   4. Housings must serve as blocking during erection. When the equipment is at full operating weight, the springs must be adjusted to assume the weight and the spacers removed, without changing the installed and operating heights. All restraining bolts must have large rubber grommets to provide cushioning in the vertical as well as horizontal modes.
   5. The hole through the bushing must be a minimum of 0.75"(20mm) larger in diameter than the restraining bolt.
   6. Horizontal clearance on the sides between the spring assembly and the housing must be a minimum of 0.5"(12mm) to avoid bumping and interfering with the spring action.
   7. Vertical limit stops must be out of contact during normal operation.
   8. Cooling tower mounts are to be located between the supporting steel and the roof or the grillage and dunnage as shown on the drawings when there is no provision for direct mounting.
   9. Housings and springs must be powder coated and hardware electro galvanized.
   10. The ratio of the spring diameter divided by the compressed spring height must be no less than 0.8. Springs must have a minimum additional travel to solid equal to 50% of the rated deflection.
   11. Submittals must include spring diameters, deflection, compressed spring height and solid spring height.

B. Restrained Spring Isolators (Multiple Bellows Air Springs) – Type G
   1. Multiple bellow air springs must be manufactured with powder coated upper and lower steel sections connected by a replaceable, flexible Nylon reinforced Neoprene element to achieve a maximum natural frequency of 3 Hz.
   2. Burst pressure must be a minimum of 3 times the published maximum operating pressure.
   3. All air spring systems must be equipped with 3 leveling valves connected to the building control air or a supplementary air supply to maintain elevation plus or minus 1/8"(3mm).
   4. An air filter and water separator must be installed before the air distribution system to the leveling valves.
   5. Equipment with large variations in the operating and installed weight, such as chillers, boilers, etc., and equipment exposed to the wind such as cooling towers, roof mounted fans and roof mounted air handling equipment must be mounted on air springs.
   6. Rigid sided housing that includes vertical limit stops to prevent spring extension when weight is removed and temporary steel spacers between the upper and lower housings.

7. Housings must serve as blocking during erection. When the equipment is at full operating weight, the air springs must be pressurized to take the weight so the spacers can be removed without changing the installed and operating heights.
8. All restraining bolts must have large rubber grommets to provide cushioning in the vertical as well as the horizontal modes.
9. The hole through the bushing must be a minimum of 0.75"(20mm) larger in diameter than the restraining bolt.
10. Horizontal clearance between the air spring assembly and the housing must be a minimum of 0.5"(12mm) to avoid bumping and interference with the air spring action. Vertical limit stops must be out of contact during normal operation.
11. Mountings and air spring parts must be powder coated. Hardware electro galvanized.
12. Air spring systems must be connected to the building control air or a supplementary air supply and equipped with three leveling valves to maintain level within plus or minus 0.125"(3mm).

2.6 PIPE-RISER RESILIENT SUPPORT

A. Description: All-directional, acoustical pipe anchor consisting of Anchors, Guides and spring mounts – Type H.
   1. All vertical risers subjected to thermal expansion and/or contraction must be supported by spring isolators and central anchors designed to ensure loading within design limits at structural support points.
   2. The riser design must be prepared and submitted for approval by the same isolation vendor supplying the HVAC mechanical equipment isolation and must include the initial load, initial deflection, change in deflection, final load and change in load at all spring support locations. In order to minimize load changes, the initial spring deflection must be at least 4 times the thermal movement. The submittal must also include anchor loads when installed, cold filled, and at operating temperature. Include calculated pipe stress at end conditions and branch off locations as well as installation instruction. The submittal must be stamped and signed by a professional engineer licensed in the State of New York.
   3. Proper provision must be made for seismic protection in seismic zones.
   4. The isolation vendor must provide and design all brackets at riser spring and anchor locations where standard clamps lack capacity or do not fit. The subcontractor must install and adjust all isolators under the supervision of the designing isolation vendor or a representative.
   5. All vertical risers must be supported by spring isolators designed to support the riser filled with water, if it is a water line.
   6. Assigned loads must be within the building design limits at the support points. Neutral central resilient anchors close to the center of the run must direct movement up and down.
   7. The anchors must be capable of holding an upward force equal to the water weight when the system is drained. If one level cannot accommodate this force, anchors can be located on 2 or 3 adjacent floors.

8. Resilient guides must be spaced and sized properly depending on the pipe diameter. Submittals must include the initial load, initial deflection, change in deflection, final load and change in load at all spring and anchor support locations, as well as guide spacing.
9. The initial spring deflection must be a minimum of 0.75"(20mm) or four times the thermal movement at the isolator location, whichever is greater.
10. Calculations must include pipe stress at end conditions and branch off locations and the manufacturer must include installation instructions. Submittal must be stamped and signed by a professional engineer licensed in the State of New York experienced in similar work.

B. Resilient Pipe Guides – Type H-1
   1. Description: Telescopic arrangement of post and sleeve arrangement separated by a minimum 1/2-inch- thick neoprene.
      a. Pipe guides must consist of a telescopic arrangement of two sizes of steel tubing separated by a minimum 1/2"(12mm) thickness of 60 durometer or softer neoprene.
      b. The height of the guides must be preset with a shear pin to allow vertical motion due to pipe expansion or contraction.
      c. Guides must be capable of 1-5/8"(40mm) motion, or to meet location requirements.

C. Pipe Anchors – Type H-2
   1. Description: All directional acoustical pipe anchors consist of two sizes of steel tubing separated by a minimum 1/2"(12mm) thickness of 60 duro or softer neoprene.
      a. Split Seals consist of pipe halves with minimum 3/4"(20mm) thick neoprene sponge cemented to the inner faces.
      b. Vertical restraint must be provided by similar material arranged to prevent up or down vertical travel.
      c. Allowable loads on the isolation material must not exceed 500 psi (3.45 N/mm2) and the design must be balanced for equal resistance in any direction.

2.7 ACOUSTICAL WALL, CEILING OR FLOOR SEAL – Type I

A. Description: Split Seals consist of pipe halves with minimum 3/4"(20mm) thick neoprene sponge cemented to the inner faces.
   1. The seal must be tightened around the pipe to eliminate clearance between the inner sponge face and the piping.
   2. Concrete may be packed around the seal to make it integral with the floor, wall or ceiling if the seal is not in place prior to the construction of the building member.
   3. Seals must project a minimum of 1"(25mm) past either face of the wall. Where temperatures exceed 240F (115C), 10 lb. density fiberglass may be used in lieu of the sponge.

2.8 SPRING HANGERS

A. Spring Isolator - Type J:

1. Hangers must consist of rigid steel frames containing minimum 1-1/4"(32mm) thick neoprene elements at the top and a steel spring seated in a steel washer reinforced neoprene cup on the bottom.
2. The neoprene element and the cup must have neoprene bushings projecting through the steel box. In order to maintain stability the boxes must not be articulated as clevis hangers nor the neoprene element stacked on top of the spring.
3. Spring diameters and hanger box lower hole sizes must be large enough to permit the hanger rod to swing through a 30° arc from side to side before contacting the cup bushing and short circuiting the spring.
4. The ratio of the spring diameter divided by the compressed spring height must be no less than 0.8. Springs must have a minimum additional travel to solid equal to 50% of the rated deflection.
5. Submittals must include a hanger drawing showing the 30° capability.

B. Spring Isolator – Type K

1. Hangers must consist of rigid steel frames containing minimum 1-1/4"(32mm) thick neoprene elements at the top and a steel spring seated in a steel washer reinforced neoprene cup on the bottom.
2. The neoprene element and the cup must have neoprene bushings projecting through the steel box. In order to maintain stability the boxes must not be articulated as clevis hangers nor the neoprene element stacked on top of the spring.
3. Spring diameters and hanger box lower hole sizes must be large enough to permit the hanger rod to swing through a 30° arc from side to side before contacting the cup bushing and short circuiting the spring.
4. The ratio of the spring diameter divided by the compressed spring height must be no less than 0.8. Springs must have a minimum additional travel to solid equal to 50% of the rated deflection.
5. Submittals must include a hanger drawing showing the 30° capability.
6. Hangers must be pre-compressed and locked at the rated deflection by means of a resilient upstop to keep the piping or equipment at a fixed elevation during installation.
7. The hangers must be designed with a release mechanism to free the spring after the installation is complete and the hanger is subjected to its full load. Deflection must be clearly indicated by means of a scale.
8. Submittals must include a drawing of the hanger showing the 30° capability.

C. Spring Isolator – Type L (No Neoprene Element)

1. Hangers must consist of rigid steel frames containing minimum 1-1/4"(32mm) thick neoprene elements at the top and a steel spring seated in a steel washer reinforced neoprene cup on the bottom.
2. Spring diameters and hanger box lower hole sizes must be large enough to permit the hanger rod to swing through a 30° arc from side to side before contacting the cup bushing and short circuiting the spring.
3. The ratio of the spring diameter divided by the compressed spring height must be no less than 0.8. Springs must have a minimum additional travel to solid equal to 50% of the rated

deflection.

4. Hangers must be manufactured with minimum characteristics, but without the neoprene element.
5. Springs are seated in a steel washer reinforced neoprene cup that has a neoprene bushing projecting through the bottom hole to prevent rod to hanger contact.
6. Spring diameters and the lower hole sizes, must be large enough to allow the hanger rod to swing through a 30° arc from side to side before contacting the cup bushing.
7. If ducts are suspended by flat strap iron, the hanger assembly must be modified by the manufacturer with an eye on top of the box and on the bottom of the spring hanger rod to allow for bolting to the hanger straps.
8. Submittals on either of the above hangers must include a scale drawing of the hanger showing the 30° capability.

D. Spring Hanger Guidelines:

1. The first four pipe hangers in the main lines near the mechanical equipment must be Type J.
2. Hangers supporting piping 2" and larger in all other locations throughout the building must be isolated by Type I.
3. Heat exchangers and expansion tanks are considered part of the piping run.
4. The first four isolators from the isolated equipment must have the same static deflection as specified for the mountings under the connected equipment.
5. If piping is connected to equipment located in basements and hangs from ceilings under occupied spaces the first four hangers must have 0.75" deflection for pipe sizes up to and including 3", 1-1/2" deflection for pipe sizes over 3" and up to and including 6", and 2-1/2" deflection thereafter.
6. Where piping connects to mechanical equipment install Type R expansion joints or specification P stainless hoses if O is not suitable for the service.
7. All piping passing through the equipment walls, floors or ceilings must be protected against sound leakage by means of an acoustical seal, Type J.
8. All air ducts with a cross section of 2ft2 or larger must be isolated from the building structure by Type K hangers with a minimum deflection of 0.75". Isolators must continue for 50' from the equipment.
9. If air velocity exceeds 1000 fpm, hangers or supports must continue for an additional 50' or as shown on the drawings

2.9 HORIZONTAL THRUST RESTRAINTS

A. Horizontal Thrust Restraint – Type M

1. Restraint spring must be free standing and laterally stable without any housing and complete with a molded neoprene cup or 1/4"(6mm) neoprene acoustical friction pad between the baseplate and the support.
2. The ratio of the spring diameter divided by the compressed spring height must be no less than 0.8. Springs must have a minimum additional travel to solid equal to 50% of the rated deflection.

3. The assembly must be preset at the factory and fine tuned in the field to allow for a maximum of 1/4"(6mm) movement from stop to maximum thrust.
4. The assemblies must be furnished with rod and angle brackets for attachment to both the equipment and duct work or the equipment and the structure.
5. Restraints must be attached at the center line of thrust and symmetrically on both sides of the unit.

2.10 VIBRATION ISOLATION EQUIPMENT BASES

A. Steel Rails (Inverted Saddles): Factory-fabricated, welded, structural-steel rails - Type N

1. Design Requirements: Lowest possible mounting height with not less than (4) -inches clearance above the floor. Include equipment anchor bolts and auxiliary motor slide rails.

   a. Include supports for suction and discharge elbows for pumps.

2. Structural Steel: Steel shapes, plates, and bars complying with ASTM A 36/A 36M. Rails must have shape to accommodate supported equipment.
3. Support Brackets: Factory-welded steel brackets on frame for outrigger isolation mountings and to provide for anchor bolts and equipment support.

B. Steel Bases: Factory-fabricated, welded, structural-steel bases and rails - Type O.

1. Design Requirements: Lowest possible mounting height with not less than 1-inch clearance above the floor. Include equipment anchor bolts and auxiliary motor slide bases or rails.

   a. Include supports for suction and discharge elbows for pumps.

2. Structural Steel: Steel shapes, plates, and bars complying with ASTM A 36/A 36M. Bases must have shape to accommodate supported equipment.
3. Support Brackets: Factory-welded steel brackets on frame for outrigger isolation mountings and to provide for anchor bolts and equipment support.
4. Centrifugal refrigeration machines and pump bases may be T or L shaped.
5. Pump bases for split case pumps must be large enough to support suction and discharge elbows.
6. All perimeter members must be steel beams with a minimum depth equal to 1/10 of the longest dimension of the base. Base depth need not exceed 14"(350mm) provided that the deflection and misalignment is kept within acceptable limits as determined by the manufacturer.
7. Height saving brackets must be employed in all mounting locations to provide a base clearance of 1"(25mm).

2.11 ISOLATION ROOF-CURB RAILS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Mason Industries, Inc
2. Ace Mountings Co., Inc.
3. Kinetics Noise Control.
4. Thybar Corporation.
5. Or approved equal.

B. Spring Isolated Curb – Type Q

1. Description: Factory-assembled, fully enclosed, insulated, air- and watertight curb rail designed to resiliently support equipment and must include the following:
2. Curb mounted rooftop equipment must be mounted on spring isolation curbs.
3. The lower member must consist of a sheet metal Z section containing adjustable and removable steel springs that support the upper floating section.
4. The upper frame must provide continuous support for the equipment and must be captive so as to resiliently resist wind forces.
5. Lower Support Assembly: The lower support assembly must be formed sheet metal section containing adjustable and removable steel springs that support upper frame. The lower support assembly must have a means for attaching to building structure and a wood nailer for attaching roof materials and must be insulated with a minimum of 2 inches of rigid glass-fiber insulation on inside of assembly. Adjustable, restrained-spring isolators must be mounted on elastomeric vibration isolation pads and must have access ports, for level adjustment, with removable waterproof covers at all isolator locations. Isolators must be located so they are accessible for adjustment at any time during the life of the installation without interfering with the integrity of the roof.
6. All directional neoprene snubber bushings must be a minimum of 1/4"(6mm) thick.
7. Steel springs must be laterally stable and rest on 1/4"(6mm) thick neoprene acoustical pads.
8. Hardware must be plated and the springs provided with a rust resistant finish.
9. The curbs waterproofing must consist of a continuous galvanized flexible counter flashing nailed over the lower curb’s waterproofing and joined at the corners by EPDM bellows.
10. All spring locations must have access ports with removable waterproof covers. Lower curbs must have provision for 2"(50mm) of insulation.

C. Vibration Isolation Bases – Type R

1. Curb mounted rooftop equipment must be mounted on vibration isolation bases that fit over the roof curb and under the isolated equipment.
2. The extruded aluminum top member must overlap the bottom to provide water runoff independent of the seal. Aluminum members must house electro galvanized or powder coated springs selected for 0.75"(20mm) minimum deflection.
3. Travel to solid must be 1.5"(40mm) minimum.
4. Spring diameters must be no less than 0.8 of the spring height at rated load. Wind resistance must be provided by means of resilient snubbers in the corners with a minimum clearance of 1/4"(6mm) so as not to interfere with the spring action except in high winds.
5. Manufacturer's self-adhering closed cell sponge gasketing must be used both above and below the base and a flexible EPDM duct like connection must seal the outside perimeter.
6. Foam or other sliding or shear seals are unacceptable in lieu of the EPDM ductlike closure.

7. Submittals must include spring deflections, spring diameters, compressed spring height and solid spring height as well as seal and wind resistance details.

2.12 RUBBER EXPANSION JOINTS – Type S

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Mason Industries, Inc.
   2. Kinetics Noise Control, Inc.
   3. Vibration Eliminator Co., Inc.
   4. Vibration Mountings & Controls, Inc.
   5. Or approved equal.

B. Expansion Joint:
   1. Rubber expansion joints must be peroxide cured EPDM throughout with aramid fiber tire cord reinforcement.
   2. The raised face rubber flanges must encase solid steel rings to prevent pull out.
   3. Flexible cable wire is not acceptable.
   4. Sizes 1-1/2" through 14" must have a ductile iron external ring between the two spheres.
   5. Sizes 16" through 24" may be single sphere.
   6. Sizes 3/4" through 2"(20mm through 50mm) may have one sphere, bolted threaded flange assemblies and cable retention.
   7. Minimum ratings through 14"(350mm) must be 250psi at 170F and 215psi at 250F., 16" through 24" 180psi at 170F and 150psi at 250F. Higher published rated connectors may be used where required.
   8. Safety factors must be a minimum of 3/1. All expansion joints must be factory tested to 150% of maximum pressure for 12 minutes before shipment.
   9. The piping gap must be equal to the length of the expansion joint under pressure.
   10. Control rods passing through 1/2" thick Neoprene washer bushings large enough to take the thrust at 1000psi of surface area may be used on unanchored piping where the manufacturer determines the condition exceeds the expansion joint rating without them.
   11. Submittals must include two test reports by independent consultants showing minimum reductions of 20 DB in vibration accelerations and 10 DB in sound pressure levels at typical blade passage frequencies on this or a similar product by the same manufacturer.
   12. All expansion joints must be installed on the equipment side of the shut off valves.

2.13 FLEXIBLE HOSES

A. Flexible Stainless-Steel Hoses – Type T:
   1. Flexible stainless-steel hose must have stainless steel braid and carbon steel fittings. Sizes 3" and larger must be flanged. Smaller sizes may have male nipples. Minimum lengths must be as tabulated below:

Flanged

3" x 12"	6” x 18”	12” x 24”
4" x 12"	8” x 18”	14” x 30”
5” x 18”	10” x 18”	16” x 18”
Male Nipples		
½” x 12”	1-1/4” x 12”	2” x 12”
¾” x 12”	1-1/2” x 12”	2-1/2” x 18”
1” x 12”		

2. At equipment, hoses must be installed on the equipment side of the shut off valves horizontal and parallel to the equipment shafts wherever possible.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine areas and equipment to receive vibration isolation control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 VIBRATION ISOLATION EQUIPMENT BASES INSTALLATION

A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement.

3.4 INSPECTION

A. On completion of installation of all vibration isolation devices herein specified, the local representative of the isolation materials manufacturer(s) must inspect the completed system and report in writing any installation errors, improperly selected isolation devices, or other faults that could affect the performance of the system. Subcontractor must submit a report to the Commissioner, including the manufacturer's representative’s final report, indicating all isolation reported as properly installed or requiring correction, and include a report by the Subcontractor on steps taken to properly complete the isolation work.
   1. ISOLATOR APPLICATION SCHEDULE

ISOLATION SELECTION GUIDE			EQUIPMENT INSTALLATION ARRANGEMENT					
			MOUNTED			SUSPENDED		
EQUIPMENT	SIZE	LOCATION	BASE TYPE	ISOLATOR TYPE	DEFL (in.)	BASE TYPE	ISOLATOR TYPE	DEFL (in.)
Air Handlers Without Internal Isolated Fan Sections		Above Grade	Per Mfr.	E		Per Mfr.	J,K	
Below – 300 rpm (or VFD)					4.0			4.25
301 – 450 rpm					3.5			3.75
451 – 600 rpm					3.0			3.25
601 – 750 rpm					2.0			2.25
751 – 850 rpm					1.5			1.75
851 - greater					1.0			1.25
Air Handlers With Internal Isolated Fans		Above Grade	Per Mfr.	A	0.25		D	0.5
Air Handlers		ON GRADE	Per Mfr.	A	0.25	----	----	----
Condensate Pumps		All	Per Mfr.	A	0.10	----	----	----
Drycoolers		All	Per Mfr.	F,G	2.0	----	----	----
Air-Cooled Condenser		All	Per Mfr.	F,G	2.0	----	----	----
Air-Cooled Chillers		All	Per Mfr.	F,G	2.0	----	----	----
PUMPS[3] - Mechanical and Domestic Water	5HP +	All	B-2	F,G[1],[2]	2.0	Per Mfr.	J,K	2.25
	< 5HP		B-1	B	0.5		D	0.5
	VFD		B-2	F,G[1],[2]	4.0		J,K	4.25
Heat Exchangers			Per Mfr.	B	0.25	----	----	----
Cooling Towers		Above Grade	Per Mfr.	F,G		----	----	----
Below – 300 rpm (or VFD)					4.0			
301 – 450 rpm					3.5			
451 – 600 rpm					3.0			
601 – 750 rpm					2.0			
751 – 850 rpm					1.5			
851 - greater					1.0			
Boilers & Steam Generators		Above Grade	Per Mfr.	F,G	1.0	----	----	----
Transformers (Interior Dry Type)	< 45 kVA	All	Per Mfr.	A,B	0.5	Per Mfr.	D	0.5

	45 kVA +	All	Per Mfr.	F,G(1),(2	1.0	----	----	----
Chillers – Absorption, Centrifugal, Rotary/Screw		Above Grade	Per Mfr.	F,G(1)	1.0	----	----	----
Chillers – Absorption, Centrifugal, Rotary/Screw		ON GRADE	Per Mfr.	B	0.5	----	----	----
Chillers – Reciprocating		ALL	Per Mfr.	F,G(1)	2.0	----	----	----
Fans – Cabinet, Centrifugal, In-Line Centrif.								
Below – 300 rpm (or VFD)			P		4.0			4.25
301 – 450 rpm			O	F,G(1)	3.5	Per Mfr.	J,K	3.75
451 – 600 rpm			O		3.0			3.25
601 – 750 rpm			O		2.0			2.25
751 – 850 rpm			O		1.5			1.75
851 - greater			O		1.0			1.25
Curb Mounted Roof Equip.		Roof	B-3	Q,R	Per fan RPM above	----	----	----
Pressure Reducing Valve		All		A,B	0.5		D	0.5
Vertical Pipe Riser		All		H	0.75		H,I	0.75
Horizontal Piping		ALL		E			I,J,K	

Notes for Isolation Selection Guide

(1) Double Layer neoprene isolation pads to be included within spring assembly cup.
(2) Electrical Connections to be made with minimum 18” flexible conduit.
(3) In-Line Pumps to be mounted per manufacturer’s recommendations.

END OF SECTION 23 05 48.13

SECTION 23 05 53 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.
4. Duct labels.
5. Stencils.
6. Valve tags.
7. Warning tags.

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: Submit product data and cutsheets for the following components for the Commissioner’s review:

1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.
4. Duct labels.
5. Stencils.
6. Valve tags.
7. Warning tags.

C. Samples: For color, letter style, and graphic representation required for each identification material and device.

D. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.

E. Valve numbering scheme.

F. Valve Schedules: For each piping system to be included in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 01400 “Quality Requirements.”

1.6 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with locations of access panels and doors.

C. Install identifying devices before installing acoustic ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Tags and labels should be durable and able to withstand the operating conditions of the HVAC system, including temperature, humidity, and exposure to chemicals.

B. Tags and labels should be easy to read and understand, even from a distance or in low-light conditions.

C. Tags and labels should be made from materials suitable for the environment, such as weather-resistant materials for outdoor applications.

D. Tags and labels should adhere securely to the piping surface to prevent loss or damage.

E. Tags and labels should use color coding to quickly and easily identify different types of piping or systems.

F. Tags and labels should adhere securely to the piping surface to prevent loss or damage.

G. Tags and labels should integrate with existing piping systems and components without interfering with their operation.

H. Tags and labels should be easy to maintain and update as needed, such as when modifications are made to the system.

I. Tags and labels should comply with relevant standards and regulations, such as those set by ASME and/or NYC Building Code.

2.2 EQUIPMENT LABELS

A. Metal Labels for Equipment:

1. Material and Thickness: Brass, 0.032-inch minimum thickness and having predrilled or stamped holes for attachment hardware.
2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
4. Fasteners: Stainless-steel rivets.
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 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.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule must be included in operation and maintenance data.

2.3 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick and having predrilled holes for attachment hardware.

B. Letter Color: White.

C. Background Color: Red.

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.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.4 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 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 high.

2.5 DUCT LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick and having predrilled holes for attachment hardware.

B. Letter Color: Black.

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.

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.

2.6 STENCILS

A. Stencils: Prepared with letter sizes according to ASME A13.1 for piping; minimum letter height of 1-1/4 inches for ducts; and minimum letter height of 3/4 inch for access panel and door labels, equipment labels, and similar operational instructions.

1. Stencil Material: Aluminum.
2. Stencil Paint: Exterior, gloss, alkyd enamel black unless otherwise indicated. Paint may be in pressurized spray-can form.
3. Identification Paint: Exterior, alkyd enamel in colors according to ASME A13.1 unless otherwise indicated.

2.7 VALVE TAGS

A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.

1. Tag Material: Brass, 0.032-inch minimum thickness and having predrilled or stamped holes for attachment hardware.
2. Fasteners: Brass wire-link or beaded chain; or S-hook.

B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.

1. Valve-tag schedule must be included in operation and maintenance data.

2.8 WARNING TAGS

A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.

1. Size: 3 by 5-1/4 inches minimum.
2. Fasteners: Brass grommet and wire.
3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
4. Color: Yellow background with black lettering.

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. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels with painted, color-coded bands or rectangles, complying with ASME A13.1, on each piping system.

1. Identification Paint: Use for contrasting background.

2. Stencil Paint: Use for pipe marking.

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 along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.

C. Pipe Label Color Schedule:

1. Chilled-Water Piping:

a. Background Color: Green.
b. Letter Color: White.

2. Condenser-Water Piping:

a. Background Color: Green.
b. Letter Color White.

3. Refrigerant Piping:

a. Background Color: Green.
b. Letter Color: White.

3.5 DUCT LABEL INSTALLATION

A. Install plastic-laminated self-adhesive duct labels with permanent adhesive on air ducts in the following color codes:

1. Blue: For cold-air supply ducts.
2. Yellow: For hot-air supply ducts.
3. Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
4. ASME A13.1 Colors and Designs: For hazardous material exhaust:
   a. Orange background with black lettering.

B. Stenciled Duct Label Option: Stenciled labels, showing service and flow direction, may be provided instead of plastic-laminated duct labels, at Installer's option, if lettering larger than 1

inch high is needed for proper identification because of distance from normal location of required identification.

C. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 20 feet in each space where ducts are exposed or concealed by removable ceiling system.

3.6 VALVE-TAG INSTALLATION

A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-watering hose connections; and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:

1. Valve-Tag Size and Shape:

    a. Chilled Water: 2 inches square round.
    b. Condenser Water: 2 inches round.
    c. Refrigerant: 2 inches round.
    d. Gas: 2 inches round.

2. Valve-Tag Color:

    a. Chilled Water: Green
    b. Condenser Water: Green
    c. Refrigerant: Green
    d. Gas: Yellow

3. Letter Color:

    a. Chilled Water: White
    b. Condenser Water: White
    c. Refrigerant: White
    d. Gas: Black

3.7 WARNING-TAG INSTALLATION

A. Write the required message on, and attach warning tags to, equipment and other items where required.

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.

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 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.5 SUBMITTALS

A. Qualification Data: Within 10 business days of Subcontractor's Notice to Proceed, submit documentation that the TAB Subcontractor and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.

B. Contract Documents Examination Report: Within 10 business days of Subcontractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.

C. Strategies and Procedures Plan: Within 30 business days of Subcontractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

D. Certified TAB reports.

E. Sample report forms.

F. Instrument calibration reports, to include the following:

1. Instrument type and make.
2. Serial number.
3. Application.
4. Dates of use.
5. Dates of calibration.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

B. TAB Subcontractor Qualifications: Engage a TAB entity certified by TABB.

1. TAB Field Supervisor: Employee of the TAB subcontractor and certified by TABB.

2. TAB Technician: Employee of the TAB subcontractor who is certified by TABB as a TAB technician.

C. TAB Conference: Meet with Commissioner on approval of the TAB strategies and procedures plan to develop a mutual understanding of the details. Require the participation of the TAB field supervisor and technicians. Provide seven days' advance notice of scheduled meeting time and location.

1. Agenda Items:

a. The Contract Documents examination report.
b. The TAB plan.
c. Coordination and cooperation of trades and subcontractors.
d. Coordination of documentation and communication flow.

D. 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.

E. TAB Report Forms: Use standard TAB subcontractor's forms approved by Commissioner.

F. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.7 PROJECT CONDITIONS

A. Full Occupancy: City of New York will occupy the site and existing building during entire TAB period. Cooperate with City of New York during TAB operations to minimize conflicts with City of New York's operations.

1.8 COORDINATION

A. Notice: Provide five business days' advance notice for each test. Include scheduled test dates and times.

B. Perform TAB after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

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 and underfloor air plenums used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in Section 233113 "Metal Ducts" and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.

F. Examine equipment performance data including fan 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 terminal units, such as variable-air-volume boxes, and verify that they are accessible, 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 SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.

1. Comply with requirements in ASHRAE 62.1, 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. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 230713 "Duct Insulation," and Section 230719 "HVAC Piping Insulation."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.5 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

D. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.

E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

F. Verify that motor starters are equipped with properly sized thermal protection.

G. Check dampers for proper position to achieve desired airflow path.

H. Check for airflow blockages.

I. Check condensate drains for proper connections and functioning.

J. Check for proper sealing of air-handling-unit components.

K. Verify that air duct system is sealed as specified in Section 233113 "Metal Ducts."

3.6 PROCEDURES FOR 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.

B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.

1. Measure airflow of submain and branch ducts.

a. Where sufficient space in submain 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. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain 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 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 forceful liquid flow exiting from vents when manually operated.

3.8 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.
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 presetting.

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.

3.9 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.

1. Measure and record the operating speed, airflow, and static pressure of each fan.
2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
3. Check the refrigerant charge.
4. Check the condition of filters.
5. Check the condition of coils.
6. Check the operation of the drain pan and condensate-drain trap.
7. Check bearings and other lubricated parts for proper lubrication.
8. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.

B. Before performing testing and balancing of existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished. Verify the following:

1. New filters are installed.
2. Coils are clean and fins combed.
3. Drain pans are clean.
4. Fans are clean.
5. Bearings and other parts are properly lubricated.
6. Deficiencies noted in the preconstruction report are corrected.

C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured fan airflows, and determine the new fan speed and the face velocity of filters and coils.
2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
3. If calculations increase or decrease the air flow rates and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.
4. Balance each air outlet.

3.10 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. Cooling-Water Flow Rate: Plus or minus 10 percent.

3.11 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in the "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 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.

3.12 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 subcontractor.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB subcontractor.
3. Project name.
4. Project location.
5. Commissioner's name and address.
6. Subcontractor's name and address.
7. Report date.
8. Signature of TAB subcontractor who certifies the report.
9. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.

10. 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.

11. Nomenclature sheets for each item of equipment.
12. Data for terminal units, including manufacturer's name, type, size, and fittings.
13. Notes to explain why certain final data in the body of reports vary from indicated values.
14. Test conditions for fans and pump performance forms including the following:

    a. Settings for outdoor-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Cooling coil, wet- and dry-bulb conditions.
    d. Face and bypass damper settings at coils.
    e. Fan drive settings including settings and percentage of maximum pitch diameter.
    f. Inlet vane settings for variable-air-volume systems.
    g. Settings for supply-air, static-pressure controller.
    h. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of outdoor, supply, return, and exhaust airflows.
2. 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.

E. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:

1. Unit Data:

    a. Unit identification.
    b. Location.
    c. Make and type.
    d. Model number and unit size.
    e. Manufacturer's serial number.
    f. Unit arrangement and class.
    g. Discharge arrangement.
    h. Sheave make, size in inches, and bore.
    i. Center-to-center dimensions of sheave, and amount of adjustments in inches.
    j. Number, make, and size of belts.
    k. Number, type, and size of filters.

2. Motor Data:

    a. Motor make, and frame type and size.
    b. Horsepower and rpm.
    c. Volts, phase, and hertz.
    d. Full-load amperage and service factor.
    e. Sheave make, size in inches, and bore.
    f. Center-to-center dimensions of sheave, and amount of adjustments in inches.

3. Test Data (Indicated and Actual Values):

    a. Total air flow rate in cfm.
    b. Total system static pressure in inches wg.
    c. Fan rpm.
    d. Discharge static pressure in inches wg.
    e. Filter static-pressure differential in inches wg.
    f. Preheat-coil static-pressure differential in inches wg.
    g. Cooling-coil static-pressure differential in inches wg.
    h. Heating-coil static-pressure differential in inches wg.
    i. Outdoor airflow in cfm.
    j. Return airflow in cfm.
    k. Outdoor-air damper position.
    l. Return-air damper position.
    m. Vortex damper position.

F. Fan Test Reports: For supply, return, and exhaust fans, include the following:

1. Fan Data:

    a. System identification.
    b. Location.
    c. Make and type.
    d. Model number and size.
    e. Manufacturer's serial number.
    f. Arrangement and class.
    g. Sheave make, size in inches, and bore.
    h. Center-to-center dimensions of sheave, and amount of adjustments in inches.

2. Motor Data:

    a. Motor make, and frame type and size.
    b. Horsepower and rpm.
    c. Volts, phase, and hertz.
    d. Full-load amperage and service factor.
    e. Sheave make, size in inches, and bore.
    f. Center-to-center dimensions of sheave, and amount of adjustments in inches.
    g. Number, make, and size of belts.

3. Test Data (Indicated and Actual Values):

    a. Total airflow rate in cfm.
    b. Total system static pressure in inches wg.
    c. Fan rpm.
    d. Discharge static pressure in inches wg.
    e. Suction static pressure in inches wg.

G. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

1. Report Data:

    a. System and air-handling-unit number.
    b. Location and zone.
    c. Traverse air temperature in deg F.
    d. Duct static pressure in inches wg.
    e. Duct size in inches.
    f. Duct area in sq. ft..
    g. Indicated air flow rate in cfm.
    h. Indicated velocity in fpm.
    i. Actual air flow rate in cfm.
    j. Actual average velocity in fpm.
    k. Barometric pressure in psig.

H. Pump Test Reports: Calculate impeller size by plotting the shutoff head on pump curves and include the following:

1. Unit Data:

    a. Unit identification.
    b. Location.
    c. Service.
    d. Make and size.
    e. Model number and serial number.
    f. Water flow rate in gpm.
    g. Water pressure differential in feet of head or psig.
    h. Required net positive suction head in feet of head or psig.
    i. Pump rpm.
    j. Impeller diameter in inches.
    k. Motor make and frame size.
    l. Motor horsepower and rpm.
    m. Voltage at each connection.
    n. Amperage for each phase.
    o. Full-load amperage and service factor.
    p. Seal type.

2. Test Data (Indicated and Actual Values):

   a. Static head in feet of head or psig.
   b. Pump shutoff pressure in feet of head or psig.
   c. Actual impeller size in inches.
   d. Full-open flow rate in gpm.
   e. Full-open pressure in feet of head or psig.
   f. Final discharge pressure in feet of head or psig.
   g. Final suction pressure in feet of head or psig.
   h. Final total pressure in feet of head or psig.
   i. Final water flow rate in gpm.
   j. Voltage at each connection.
   k. Amperage for each phase.

I. Instrument Calibration Reports:

1. Report Data:

   a. Instrument type and make.
   b. Serial number.
   c. Application.
   d. Dates of use.
   e. Dates of calibration.

3.13 INSPECTIONS

A. Final Inspection:

1. After initial inspection is complete and documentation by random checks verifies that testing and balancing are complete and accurately documented in the final report, request that a final inspection be made by Commissioner.

2. The TAB subcontractor's test and balance engineer licensed in the State of New York must conduct the inspection in the presence of the Commissioner.

END OF SECTION 23 05 93

SECTION 23 07 13 - DUCT 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 insulating the following duct services:
   1. Outdoor, exposed supply and return.

B. Related Sections:
   1. Section 230719 "HVAC Piping Insulation."
   2. Section 233113 "Metal Ducts".

C. References:
   1. ASTM International (ASTM)
   2. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE)
   3. North American Insulation Manufacturers Association (NAIMA)
   4. National Fire Protection Association (NFPA)
   5. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)
   6. Underwriter’s Laboratories (UL)
   7. Underwriter’s Laboratories Environment and UL Environment/GREENGUARD.
   8. UL 2824 – GREENGUARD Certification Program Method for Measuring Microbial Resistance from Various Sources Using Static Environmental Chambers.

D. Definitions:
   1. Thermal Conductivity (k value): Btu•in./hr.•ft²•°F
   2. UL Environment and UL Environment GREENGUARD provides independent, third-party, Indoor Air Quality (IAQ) certification of products for emissions of respirable particles and Volatile Organic Compounds (VOC’s), including formaldehyde and other specific product-related pollutants. Certification is based upon criteria used by EPA, OSHA and WHO.
   3. IAQ: Indoor Air Quality
   4. EPA: Environmental Protection Agency
   5. WHO: World Health Organization
   6. ASJ+: All Service Jacket composed of aluminum foil reinforced with glass scrim bonded to a kraft paper interleaving with an outer film layer leaving no paper exposed.
   7. ASJ: All Service Jacket
   8. SSL+: Self-sealing Advanced Closure System

9. SSL: Self-Sealing Lap
10. FSK: Foil-Scrim-Kraft; jacketing
11. PSK: Poly-Scrim-Kraft; jacketing
12. PVC: Polyvinyl Chloride
13. FRP: Fiberglass Reinforced Plastic
14. UL Classified: UL has tested and evaluated samples of the product with respect to certain properties of the product. UL Classifies products to:
    a. Applicable UL requirements
    b. Standards for safety
    c. Standards of other National and International organizations
15. EPD: Environmental Product Declaration. A third party verified document that reports environmental data of products based on the Life Cycle Assessment (LCA) and other relevant information, and in accordance with the International Standard ISO 14025 (Type III Environmental Declarations).

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.4 SUBMITTALS

A. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
   2. Detail insulation application at elbows, fittings, dampers, specialties and flanges for each type of insulation.
   3. Detail application of field-applied jackets.
   4. Detail application at linkages of control devices.

B. Qualification Data: For qualified Installer.

C. Material Test Reports: From a qualified testing agency acceptable to the Commissioner indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

D. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

B. Installer Qualifications: Skilled mechanics.

C. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to UL 723 or ASTM E 84, by a testing agency acceptable to

Commissioner. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing 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 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers must be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

B. Coordinate clearance requirements with duct subcontractor for duct insulation application. Before preparing ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.8 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, installing and testing heat tracing. Insulation applications may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with requirements in "Duct Insulation Schedule, General," and "Aboveground, Outdoor Duct and Plenum Insulation Schedule" articles for where insulating materials must be applied.

B. Products must not contain formaldehyde, asbestos, lead, mercury, or mercury compounds, whenever possible.

C. Insulation materials applied to carbon steel must be Mass Load Corrosion Rate (MLCR) tested per ASTM C 1617.

D. Insulation materials for use on austenitic stainless steel must be qualified as acceptable according to ASTM C 795.

E. Products must contain no polybrominated diphenyl ethers (PBDE) such as Penta-BDE, Octa-BDE or Deca-BDE fire retardants; whenever available.

F. Foam insulation materials must not use CFC or HCFC blowing agents in the manufacturing process.

2.2 INSULATION MATERIALS

A. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Types I, II and III, ASTM C 1136 Type II and ASTM C 1290, Type I with factory-applied FSK jacket. UL/ULC Classified FSK, FHC 25/50 per ASTM E 84 for PSK only. UL GREENGUARD Gold Certified and UL Environment Validated to be formaldehyde free. Product must contain no polybrominated diphenyl ethers (PBDE) such as Penta-BDE, Octa-BDE or Deca-BDE.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Knauf Insulation; Atmosphere Duct Wrap with ECOSE Technology.
      b. CertainTeed Corp.; SoftTouch Duct Wrap.
      c. Johns Manville; Microlite.
      d. Manson Insulation Inc.; Alley Wrap.
      e. Owens Corning; SOFTR All-Service Duct Wrap.
      f. Or approved equal.

B. 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.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Knauf Insulation; Insulation Board with ECOSE Technology.
      b. CertainTeed Corp.; Commercial Board.
      c. Johns Manville; 800 Series Spin-Glas.
      d. Manson Insulation Inc.; AK Board.
      e. Owens Corning; Fiberglas 700 Series.
      f. Or approved equal.

C. Mineral-Fiber, Pipe and Tank Insulation: Mineral or glass fibers bonded with a thermosetting resin. Semirigid board material with factory applied ASJ complying with ASTM C 1393, Type II or Type IIIA Category 2 or with properties similar to ASTM C 612, Type IB. The nominal density is 2.5 lb/cu. ft. or more. Thermal conductivity (k-value) at 100 deg F is 0.29 Btu x in./h x sq. ft. x deg F or less.
   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 [with Ecose Technology].
      d. Knauf Insulation; Kwikflex Pipe and Tank Insulation.
      e. Manson Insulation Inc.; AK Flex.

f. Owens Corning; Fiberglas Pipe and Tank Insulation.
g. 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 Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.
b. Eagle Bridges - Marathon Industries; 225.
c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.
d. Mon-Eco Industries, Inc.; 22-25.
e. Or approved equal
2. For indoor applications, adhesive must have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive must comply with the testing and product requirements of the California Department of Health Services "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. 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 one of the following:
a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.
b. Eagle Bridges - Marathon Industries; 225.
c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-50.
d. Mon-Eco Industries, Inc.; 22-25.
e. Or approved equal.
2. For indoor applications, adhesive must have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

D. PVC Jacket Adhesive: Compatible with PVC jacket.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Dow Corning Corporation; 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; Polyco VP Adhesive.
e. Or approved equal.
2. For indoor applications, adhesive must have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.4 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Glass-Fiber Fabric: Approximately 6 oz./sq. yd. with a thread count of 5 strands by 5 strands/sq. in. for covering ducts.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Chil-Glas No. 5.
      b. Owens Corning FOAMGLAS.
      c. Dryvit Standard Plus.
      d. Or approved equal.

B. Woven Polyester Fabric: Approximately 1 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. in., in a Leno weave, for ducts.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Mast-A-Fab.
      b. Vimasco Corporation; Elastafab 894.
      c. Scrimtex Must-A-Fab
      d. Or approved equal.

2.5 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 Corporation; LoSmoke.
      d. Speedline Corporation; SmokeSafe.
      e. Or approved equal.
   2. Adhesive: As recommended by jacket material manufacturer.
   3. Color: White.

D. Metal Jacket:
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Metal Jacketing Systems.
      b. ITW Insulation Systems; Aluminum and Stainless-Steel Jacketing.
      c. RPR Products, Inc.; Insul-Mate.
      d. Or approved equal.
   2. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.

a. Factory cut and rolled to size.
b. Finish and thickness are indicated in field-applied jacket schedules.
c. Moisture Barrier for Indoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
d. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.

2.6 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. ABI, Ideal Tape Division; 428 AWF ASJ.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.
c. Compac Corporation; 104 and 105.
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. ABI, Ideal Tape Division; 491 AWF FSK.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
c. Compac Corporation; 110 and 111.
d. Venture Tape; 1525 CW NT, 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. 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. ABI, Ideal Tape Division; 370 White PVC tape.
b. Compac Corporation; 130.
c. Venture Tape; 1506 CW NS.
d. Or approved equal.
2. Width: 2 inches.

3. Thickness: 6 mils.
4. Adhesion: 64 ounces force/inch in width.
5. Elongation: 500 percent.
6. Tensile Strength: 18 lbf/inch in width.

D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. ABI, Ideal Tape Division; 488 AWF.
   b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0800.
   c. Compac Corporation; 120.
   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.

E. Duct Wrap Tape, High Performance Tape, Facing Tape:
1. Products: Subject to compliance with requirements, provide one of the following:
   a. 3M; Fire Barrier Wrap Products.
   b. Unifrax Corporation; FyreWrap.
   c. CertainTeed Corp.; FlameChek
   d. Johns Manville; Firetemp Wrap.
   e. Nelson Fire Stop Products; Nelson FSB Flameshield Blanket.
   f. Thermal Ceramics; FireMaster Duct Wrap.
   g. Or approved equal.

2.7 SECUREMENTS

A. Bands:
1. Products: Subject to compliance with requirements, provide one of the following:
   a. ITW Insulation Systems;
   b. Gerrard Strapping and Seals.
   c. RPR Products, Inc.;
   d. Insul-Mate Strapping, Seals, and Springs.
   e. Or approved equal.
2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304; 0.015 inch thick, 3/4 inch wide with wing seal.
3. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 3/4 inch wide with wing seal.
4. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

B. Insulation Pins and Hangers:
1. Capacitor-Discharge-Weld Pins: zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135-inch diameter shank, length to suit depth of insulation indicated.

a. Products: Subject to compliance with requirements, provide one of the following:
   1. AGM Industries, Inc.; CWP-1.
   2. GEMCO; CD.
   3. Midwest Fasteners, Inc.; CD.
   4. Nelson Stud Welding; TPA, TPC, and TPS.
   5. Or approved equal.

2. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135-inch- diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.
   a. Products: Subject to compliance with requirements, provide one of the following:
      1. AGM Industries, Inc.; CHP-1.
      2. GEMCO; Cupped Head Weld Pin.
      3. Midwest Fasteners, Inc.; Cupped Head.
      4. Nelson Stud Welding; CHP.
      5. Or approved equal.
3. 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 Perforated Base Insul-Hangers.
      2. GEMCO; Perforated Base.
      3. Midwest Fasteners, Inc.; Spindle.
      4. Or approved equal.
   b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
   c. Spindle: zinc-coated fully annealed, 0.106-inch- 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.
4. 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 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.

5. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick, stainless-steel 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. 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.
6. 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1. GEMCO.
      2. Midwest Fasteners, Inc.
      3. WCL Fastener Solutions, Inc
      4. Or approved equal.
   b. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.
   c. Wire: 0.062-inch soft-annealed, stainless steel.
7. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. C & F Wire.
   b. Diamond Tackle.
   c. King Steel Corp.
   d. Or approved equal.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
   1. Verify that systems to be insulated have been tested and are free of defects.
   2. Verify that surfaces to be insulated are clean and dry.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.4 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.

B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct 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. Locate insulation and cover seams in the least visible location. All surface finishes must be extended in such a manner as to protect all raw edges, ends and surfaces of insulation.

E. Install insulation with longitudinal seams at top and bottom of horizontal runs.

F. Install multiple layers of insulation with longitudinal and end seams staggered.

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.

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. Non-self-sealing systems:
      a. Draw jacket tight and smooth.

b. 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.
c. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.

2. For below ambient services, apply vapor-barrier mastic over staples.
   a. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
   b. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.
3. Self-sealing systems ASJ+/SSL+ and ASJ/SSL:
   a. Longitudinal jacketing lap joints for pipe insulation installed on piping systems with operating temperatures below ambient must be vapor sealed with factory-applied pressure sensitive adhesive, vapor retarder self-sealing lap. For proper sealing, lap joints must be sealed with reasonable pressure being applied with a plastic squeegee. All circumferential joints must be vapor sealed with factory furnished matching, pressure sensitive butt strips installed with reasonable pressure being applied with a plastic squeegee. Additionally, raw ends of pipe insulation sections must be coated with vapor retarder mastic at 12-foot intervals on straight piping and on either side of all fittings, flanges or valves. Vapor retarder mastic must completely coat the ends of the pipe insulation and extend onto the bore of the pipe insulation and onto the jacketing a minimum of 2”.

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 beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.5 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 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.

C. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

D. Insulation Installation at Fire-Rated Wall and Partition Penetrations: 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 Section 078413 "Penetration Firestopping" firestopping and fire-resistive joint sealers.

E. Insulation Installation at Floor Penetrations:
   1. Duct: 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. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.6 INSTALLATION OF MINERAL-FIBER INSULATION

A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
   1. Install Duct Wrap using manufacturer’s stretch-out tables to obtain specified R-value using a maximum compression of 25%.
   2. Firmly butt all joints.
   3. The longitudinal seam of the vapor retarder must be overlapped a minimum of 2 inches.
   4. A 2-inch tab is provided on Duct Wrap for the circumferential seam. Secure all seams and overlaps using outward clinch staples approximately 6” on center. It is neither necessary nor desirable to adhere duct wrap to the duct surfaces with adhesive.
   5. Where vapor retarder performance is required, all penetrations and damage to the facing must be repaired using pressure-sensitive tape matching the facing, or mastic prior to system startup. Pressure-sensitive tapes must be a minimum of 3 inches wide and must be applied with moving pressure using a squeegee or other appropriate sealing tool. Closure must have a 25/50 Flame Spread/Smoke Developed Rating per UL 723.
   6. Duct Wrap must be additionally secured to the bottom of rectangular ductwork over 24 inches wide using mechanical fasteners on 18-inch centers. Care should be exercised to avoid over-compression of the insulation during installation. Unfaced Duct Wrap must be overlapped a minimum of 2 inches and fastened using 4-inch to 6-inch nails or skewers

spaced 4 inches apart or secured with a wire/banding system. Care should be exercised to avoid damage to the Duct Wrap.

7. 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 one edge and one 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 two times the insulation thickness, but not less than 3 inches.
8. 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.
9. 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.
10. 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.

B. Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
1. Apply insulation to the equipment surface with joints firmly butted and as close as possible to the equipment surface. Insulation must be secured as required with mechanical fasteners or banding material. Fasteners must be located a maximum of 3″ from each edge and spaced no greater than 12″ on center.
2. For below ambient systems, vapor retarder jacketing must overlap a minimum of 2″ at all seams and be sealed with appropriate pressure-sensitive tape or mastic. All penetrations and facing damage must be covered with a minimum 2″ overlap of tape or mastic.
3. Equipment insulation exposed to the elements must be finished with minimum 0.030-inch thick, outdoor, weather resistant PVC; laminated self-adhesive water based weatherproof mastic and glass cloth; or metal. All longitudinal joints must be positioned so as to shed water; with a minimum 3″ overlap, and completely weather sealed. Laminated systems must be applied per manufacturer's recommendations.
4. For high-temperature applications, insulation may either be mounted in direct contact with the hot surface, in H-bar configuration, or prefabricated panel systems mounted away from the operating surface. When installing H-Bar or panel systems which are mounted away from the operating surface, convection stops must be installed at a maximum of 8 feet along the vertical surfaces. Insulation may be applied over welded pins or studs up to ½″ in diameter. Insulation must be held in place using mesh reinforcement or steel bands. Insulation must not be compressed beyond a maximum of 1/8 inch at any point. Pins and studs must be spaced a maximum of 4″ from each edge and no greater than 16″ on center. For temperatures above 500°F (260°C) and design thicknesses over 3″, insulation must be applied using double-layer with staggered joints. Finish must be minimum of 0.020-inch

thick PVC jacketing, insulating cement with canvas, glass cloth with mastic, or metal as specified on the drawings.

5. For Equipment insulation exposed in mechanical rooms or subject to mechanical abuse, finish with minimum 0.020 inch thick PVC Jacketing or metal or laminated self-adhesive water and weather seals. All other insulation must be finished as appropriate for the location and service or as specified on the drawings.
6. 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 one edge and one 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 two times the insulation thickness, but not less than 3 inches.
7. 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.
8. 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.
9. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
10. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
11. 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.
12. 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 one edge and one 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 two times the insulation thickness, but not less than 3 inches.

13. 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.
14. 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 glass-cloth jackets are indicated, install directly over bare insulation or insulation with factory-applied jackets.
   1. Draw jacket smooth and tight to surface with 2-inch overlap at seams and joints.
   2. Embed glass cloth between two 0.062-inch- thick coats of lagging adhesive.
   3. Completely encapsulate insulation with coating, leaving no exposed insulation.

B. 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 insulate 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.

C. 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.

D. 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 FIRE-RATED INSULATION SYSTEM INSTALLATION

A. Where fire-rated insulation system is indicated, secure system to ducts and duct hangers and supports to maintain a continuous fire rating.

B. Insulate duct access panels and doors to achieve the same fire rating as duct.

C. Install firestopping at penetrations through fire-rated assemblies. Fire-stop systems are specified in Section 078413 "Penetration Firestopping."

D. Fire Rated Duct Wrap Insulation 1 and 2 HR. Enclosures

1. Kitchen Exhaust Grease Ducts: Install fire-resistive duct wrap insulation in direct contact with ductwork to Manufacturer's instructions and referenced standards, to applicable Intertek design numbers, including listed penetration firestop system.
    a. For kitchen exhaust grease ducts, regardless of fire rating, provide two layers of Fire Barrier Duct Wrap 615+ per layer with 3-inch (76mm) overlaps.
2. Kitchen Exhaust Ductwork: Inner layer material perimeter and longitudinal joints may either be tightly butted or minimum 3-inch (76 mm) overlaps. Outer layer overlap requirements are minimum 3-inch (76 mm) perimeter and longitudinal overlaps. If required, tape seams using minimum 3 inch (76 mm) wide aluminium foil adhesive tape.
3. Ventilation Air Ducts (1 and 2 hr. Enclosure): Install fire-resistive duct wrap insulation in direct contact with ductwork to Manufacturer's instructions and referenced standards, including Listed penetration firestop system.
    a. Apply fire-resistive duct wrap insulation continuously to ductwork as indicated on Drawings. For ventilation air ducts, provide one layer of Fire Barrier Duct Wrap 615+ with 3-inch (76 mm) overlaps for 1 and 2 hour applications. Observe requirements for additional duct wrap material required at firestop, when required.
4. Ventilation Ductwork (1 and 2 hr. applications): overlap perimeter and longitudinal joints 3 inches (76 mm). If required, tape seams using minimum 3 inch (76 mm) wide aluminium foil adhesive tape.
5. Filament tape may be used as a temporary securing measure during application of duct wrap. Finish installation using 1/2 inch (13 mm) wide by 0.015 inch (0.4 mm) steel banding on exterior layer of wrap. Spacing 10.5 inches (267 mm) on center and within 1.5 inches (39 mm) of all overlapped seams. Consult individual listings for approved banding type.
6. Duct Widths Greater than 24 Inches (610 mm): Weld insulation pins to bottom of horizontal ducts on a 12 inch (305 mm) by 10.5 inch (267 mm) maximum grid spacing. Welded insulation pins to one of the wider sides of all vertical ducts on a 12 inch (305 mm) by 10.5 inch (267 mm) maximum grid spacing. Impale duct wrap insulation over pins and secure with speed clips.
7. Duct Access Doors: Install duct wrap to Manufacturer's instructions and procedures.
8. Firestopping At Fire Separations:
    a. Firestop all wrapped ductwork penetrating fire rated concrete floors, gypsum board, block and concrete wall assemblies and gypsum board shaft wall assemblies using UL and/or Intertek firestop system Listings appropriate for the applicable duct wrap system.
    b. Kitchen exhaust grease ducts: Fire resistive duct wrap insulation to be continuous through wall or floor penetrations. Minimum 0.5 inch (13 mm), maximum 4.5 inch

(114 mm) clearance permitted between outer layer of duct wrap insulation and edge of opening. Fill annular space between edge of opening and wrapped duct with pieces of duct wrap insulation or mineral wool insulation firmly packed into opening. Compress to percentage stated and minimum depth stated in firestop listing. Recess packing material below surface on both sides of walls or top side only for floors to depth stated in firestop listing. Seal over packing material using firestop sealant to depth stated in firestop listing, flush with top side of floor and both sides of wall surfaces.

c. Ventilation ducts: Fire resistive insulation may pass continuously through fire rated wall or floor penetrations or may tightly butt to both sides of fire rated separations. Minimum 1 inch (25 mm), maximum 3-inch (76 mm) clearance permitted around unwrapped duct in opening or from edge of opening to outer layer of duct wrap. Consult individual Listed firestop systems for specific requirements.
   1. Option A: Terminate wrap at fire separation. Fill space around unwrapped duct where it passes through a fire-rated wall or floor with pieces of duct wrap insulation or mineral wool insulation firmly packed into opening. Compress to the percentage stated in the firestop listing to full depth of floor or wall. Recess packing on both sides of walls or top side of floor to depth stated in firestop listing. Seal over packing material using Fire Barrier Sealant to depth stated in firestop listing, flush with top side of floor and both sides of wall surfaces. Tightly butt fire resistive duct wrap insulation to each side of wall or floor assembly and seal interface with a continuous bead of Fire Barrier Sealant.
   2. Option B: Wrap continuous through fire separation. Fill space around continuously wrapped duct where it passes through fire rated wall or floor with pieces of duct wrap insulation or mineral wool insulation firmly packed into opening and compress to the percentage stated in the firestop listing to a minimum depth of 4 inches (102 mm). Recess packing material below surface on both sides of wall or top side of floor to depth stated in firestop listing. Seal over packing material using Fire Barrier Sealant to depth stated in firestop listing, flush with top side of floor and both sides of wall surfaces.

d. Where kitchen exhaust hoods are located within a fire rated area or zone, begin application of duct wrap insulation inside fire rated area 6 inches (152 mm) from face of fire rated wall or ceiling assembly for non-combustible fire separations, and 18 inches (457 mm) from face of wall or ceiling surface inside fire rated area for combustible fire separations, or as indicated on the Drawings. Apply two layers of duct wrap continuously to ductwork through fire separation for distance indicated on the Drawings.

3.9 FINISHES

A. Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below.
   1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
      a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Commissioner. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: For special inspections, City of New York will engage a qualified testing agency to perform tests and inspections required by the NYC Department of Buildings.

B. Perform tests and inspections.

C. 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 locations for each duct system defined in the "Duct Insulation Schedule, General" Article.

D. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.11 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:
1. Outdoor, exposed supply and return.

B. Items Not Insulated:
1. Fibrous-glass ducts.
2. Metal ducts with duct liner of sufficient thickness to comply with NYC energy code and ASHRAE/IESNA 90.1.
3. Factory-insulated flexible ducts.
4. Factory-insulated plenums and casings.
5. Flexible connectors.
6. Vibration-control devices.
7. Factory-insulated access panels and doors.

3.12 ABOVEGROUND, OUTDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Insulation materials and thicknesses are identified below. If more than one material is listed for a duct system, selection from materials listed is Subcontractor's option.

B. Exposed, round and flat-oval, supply-air duct insulation must be one of the following:
1. Mineral-Fiber Blanket: 3 inches and 0.75-lb/cu. ft. nominal density (R-8).

2. Mineral-Fiber Board: 2 inches thick and 1.6-lb/cu. Ft. nominal density (R-8).

C. Exposed, round and flat-oval, return-air duct insulation must be one of the following:
1. Mineral-Fiber Blanket: 3 inches and 0.75-lb/cu. ft. nominal density (R-8).
2. Mineral-Fiber Board: 2 inches thick and 1.6-lb/cu. Ft. nominal density (R-8).

D. Exposed, rectangular, supply-air duct insulation must be one of the following:
1. Mineral-Fiber Blanket: 3 inches and 0.75-lb/cu. ft. nominal density (R-8).
2. Mineral-Fiber Board: 2 inches thick and 1.6-lb/cu. Ft. nominal density (R-8).

E. Exposed, rectangular, return-air duct insulation must be one of the following:
1. Mineral-Fiber Blanket: 3 inches and 0.75-lb/cu. ft. nominal density (R-8).
2. Mineral-Fiber Board: 2 inches thick and 1.6-lb/cu. Ft. nominal density (R-8).

F. Exposed, supply-air plenum insulation must be one of the following:
1. Mineral-Fiber Blanket: 3 inches and 0.75-lb/cu. ft. nominal density (R-8).
2. Mineral-Fiber Board: 2 inches thick and 1.6-lb/cu. Ft. nominal density (R-8).

G. Exposed, return-air plenum insulation must be one of the following:
1. Mineral-Fiber Blanket: 3 inches and 0.75-lb/cu. ft. nominal density (R-8).
2. Mineral-Fiber Board: 2 inches thick and 1.6-lb/cu. Ft. nominal density (R-8).

3.13 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Subcontractor's option.

C. Ducts and Plenums, Concealed:
1. None.

D. Ducts and Plenums, Exposed, up to 48 Inches in Diameter or with Flat Surfaces up to 72 Inches:
1. Aluminum, Smooth: 0.024 inch thick.

E. Ducts and Plenums, Exposed, Larger Than 48 Inches in Diameter or with Flat Surfaces Larger Than 72 Inches:
1. Aluminum, Smooth with 1-1/4-Inch- Deep Corrugations thick.

END OF SECTION 23 07 13

SECTION 23 07 19 - HVAC PIPING 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. Furnish and install thermal insulation as specified herein and as indicated on the drawings.

B. Section includes insulating the following HVAC piping systems:

1. Chilled-water and brine piping, outdoors.

2. Refrigerant suction and hot-gas piping, outdoors.

C. Related Sections:

1. Section 230713 "Duct Insulation."

1.3 REFERENCE STANDARDS

A. All equipment and material to be furnished and installed must be UL or ETL listed and suitable for its intended use.

B. All thermal insulation must be designed, manufactured and tested in accordance with the following latest applicable standards.

1. ASTM B209, ASTM C591, ASTM C1136, ASTM C755, ASTM C34, ASTM C177, ASTM C355, ASTM C533, ASTM C547, ASTM C552, ASTM E84 and ASTM E96.

2. UL 723.

3. ADA.

4. NFPA 225.

1.4 SUBMITTAL PROCEDURES

A.Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Mechanical Subcontractor must submit product data including materials, thermal properties, adhesives and installation details.

2. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.

3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.

4. Detail removable insulation at piping specialties.

5. Detail application of field-applied jackets.

6. Detail application at linkages of control devices.

7. Sheet Jacket Materials: 12 inches square.

8. Manufacturer's Color Charts: For products where color is specified, show the full range of colors available for each type of finish material.

C. Qualification Data: For qualified Installer.

D. Material Test Reports: From a qualified testing agency acceptable to the commissioner indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

B. Installer Qualifications: Skilled mechanics.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers must be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.8 COORDINATION

A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

B. Coordinate clearance requirements with piping subcontractor for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.9 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with requirements in "Piping Insulation Schedule, General," 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.

2.2 INSULATION MATERIALS

A. Calcium Silicate:

1. Basis of Design Product: Subject to compliance with requirements, provide Thermo-12 Gold from Industrial Insulation Group (IIG), or comparable product by one of the following:
   a. Owens Corning
   b. Pabco
   c. Or approved equal.

2. Preformed Pipe Sections: Flat-, curved-, and grooved-block sections of noncombustible, inorganic, hydrous calcium silicate with a non-asbestos fibrous reinforcement. Comply with ASTM C 533, Type I.

3. Flat-, curved-, and grooved-block sections of noncombustible, inorganic, hydrous calcium silicate with a non-asbestos fibrous reinforcement. Comply with ASTM C 533, Type I.

4. Prefabricated Fitting Covers: Comply with ASTM C 450 and ASTM C 585 for dimensions used in preforming insulation to cover valves, elbows, tees, and flanges.

B. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells.

1. Block Insulation: ASTM C 552, Type I.

2. Special-Shaped Insulation: ASTM C 552, Type III.

3. Board Insulation: ASTM C 552, Type IV.

4. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.

5. Preformed Pipe Insulation with Factory-Applied ASJ-SSL: Comply with ASTM C 552, Type II, Class 2.

6. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.

C. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Aeroflex USA, Inc.; Aerocel.
   b. Armacell LLC; AP Armaflex.
   c. K-Flex USA; Insul-Lock, Insul-Tube, and K-FLEX LS.
   d. Or approved equal.

D. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. CertainTeed Corp.; SoftTouch Duct Wrap.
   b. Johns Manville; Microlite.
   c. Knauf Insulation; Friendly Feel Duct Wrap.
   d. Manson Insulation Inc.; Alley Wrap.
   e. Owens Corning; SOFTR All-Service Duct Wrap.
   f. Or approved equal.

E. 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-Degree Pipe Insulation.
   d. Manson Insulation Inc.; Alley-K.
   e. Owens Corning; Fiberglas Pipe Insulation.
   f. 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.

F. Mineral-Fiber, Pipe Insulation Wicking System: Preformed pipe insulation complying with ASTM C 547, Type I, Grade A, with absorbent cloth factory-applied to the entire inside surface of preformed pipe insulation and extended through the longitudinal joint to outside surface of insulation under insulation jacket. Factory apply a white, polymer, vapor-retarder jacket with self-sealing adhesive tape seam and evaporation holes running continuously along the longitudinal seam, exposing the absorbent cloth.

1. Products: Subject to compliance with requirements, provide the following;
   a. Knauf Insulation;
   b. Permawick Pipe Insulation.
   c. Owens Corning Insulation.
   d. VaporWick Pipe Insulation.
   e. Or approved equal.

G. Phenolic:

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Kingspan Tarec Industrial Insulation NV;
   b. Koolphen K.
   c. Resolco International BV;
   d. Insul-phen.
   e. Or approved equal.

2. Preformed pipe insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type III, Grade 1.

3. Block insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type II, Grade 1.

4. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.

H. Polyisocyanurate: Unfaced, preformed, rigid cellular polyisocyanurate material intended for use as thermal insulation.

1. Products: Subject to compliance with requirements, provide the following;
   a. Dow Chemical Company (The); Trymer 2000 XP.
   b. Duna USA Inc.; Corafoam.
   c. Dyplast Products; ISO-25.
   d. Elliott Company of Indianapolis; Elfoam.
   e. Or approved equal.

2. Comply with ASTM C 591, Type I or Type IV, except thermal conductivity (k-value) must not exceed 0.19 Btu x in./h x sq. ft. x deg F at 75 deg F after 180 days of aging.

3. Flame-spread index must be 25 or less, and smoke-developed index must be 50 or less for thickness up to 1 inch as tested by ASTM E 84.

4. Fabricate shapes according to ASTM C 450 and ASTM C 585.

5. Factory-Applied Jacket:
   a. Pipe Applications: ASJ-SSL.

I. Polyolefin: Unicellular, polyethylene thermal plastic insulation. Comply with ASTM C 534 or ASTM C 1427, Type I, Grade 1 for tubular materials and Type II, Grade 1 for sheet materials.

1. Products: Subject to compliance with requirements, provide one of the following;
   a. Armacell LLC
   b. Aerofoam
   c. Nomaco Insulation
   d. Or approved equal.

J. Polystyrene: Rigid, extruded cellular polystyrene intended for use as thermal insulation. Comply with ASTM C 578, Type IV or Type XIII, except thermal conductivity (k-value) must not exceed 0.26 Btu x in./h x sq. ft. x deg F after 180 days of aging. Fabricate shapes according to ASTM C 450 and ASTM C 585.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Dow Chemical Company (The)
   b. Denka
   c. DuPont
   d. 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. Calcium Silicate Adhesive: Fibrous, sodium-silicate-based adhesive with a service temperature range of 50 to 800 deg F.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-97.
   b. Marathon Industries; 290.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 81-27.
   d. Mon-Eco Industries, Inc.; 22-30.
   e. Vimasco Corporation; 760.
   f. Or approved equal.

C. Phenolic and 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 one of the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-96.
   b. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 81-33.
   c. Mon-Eco Industries, Inc.; 22-30.
   d. Vimasco Corporation; 760.
   e. Or approved equal.

2. For indoor applications, adhesive must have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

3. Adhesive must comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Aeroflex USA, Inc.; Aeroseal.
   b. Armacell LLC; Armaflex 520 Adhesive.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-75.
   d. K-Flex USA; R-373 Contact Adhesive.
   e. Or approved equal.

E. 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 Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.
   b. Marathon Industries; 225.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.
   d. Mon-Eco Industries, Inc.; 22-25.

e. Or approved equal.

F. Polystyrene Adhesive: Solvent- or water-based, synthetic resin adhesive with a service temperature range of minus 20 to plus 140 deg F.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-96.
   b. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60.
   c. Marathon Industries; 290.
   d. Or approved equal.

G. 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 Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.
   b. Marathon Industries; 225.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-50.
   d. Mon-Eco Industries, Inc.; 22-25.
   e. Or approved equal.

H. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Dow Corning Corporation; 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; Polyco VP Adhesive.
   e. Or approved equal.

2.4 SEALANTS

A. Joint Sealants:

1. Joint Sealants for Cellular-Glass, Phenolic, and Polyisocyanurate Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
   b. Marathon Industries; 405.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-45.
   d. Mon-Eco Industries, Inc.; 44-05.
   e. Pittsburgh Corning Corporation; Pittseal 444.
   f. Or approved equal.

2. Joint Sealants for Polystyrene Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-70.
   b. Marathon Industries; 405.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-45.
   d. Mon-Eco Industries, Inc.; 44-05.
   e. 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.

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 Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
   b. Marathon Industries; 405.
   c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 95-44.
   d. Mon-Eco Industries, Inc.; 44-05.
   e. 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. Sealants must comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

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 Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.
   b. Marathon Industries; 290.

c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 81-27.
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, sealants must have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

7. Sealants must comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.5 FIELD-APPLIED JACKETS

A. Metal Jacket:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Johns Manville
   b. ITW Insulation Systems
   c. RPR Products, Inc
   d. Or approved equal.

2. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
   a. Factory cut and rolled to size.
   b. Finish and thickness are indicated in field-applied jacket schedules.
   c. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
   d. Factory-Fabricated Fitting Covers:

      1) Same material, finish, and thickness as jacket.
      2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
      3) Tee covers.
      4) Flange and union covers.
      5) End caps.
      6) Beveled collars.
      7) Valve covers.
      8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

2.6 SECUREMENTS

A. Bands:

1. Products: Subject to compliance with requirements, provide one of the following:
   a. ITW Insulation Systems; Gerrard Strapping and Seals.
   b. RPR Products, Inc.; Insul-Mate Strapping, Seals, and Springs.
   c. Johns Manville; JM Strapping and Seals
   d. Or approved equal.

2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 316; 0.015 inch thick, 3/4 inch wide with closed seal.

3. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.

2. Verify that surfaces to be insulated are clean and dry.

3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:

1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.4 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of 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, according to insulation material manufacturer's written instructions, 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 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.

3.5 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 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.

C. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

D. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.

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. 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 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 INSTALLATION OF CALCIUM SILICATE INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure single-layer insulation with stainless-steel bands at 12-inch intervals and tighten bands without deforming insulation materials.

2. Install two-layer insulation with joints tightly butted and staggered at least 3 inches. Secure inner layer with wire spaced at 12-inch intervals. Secure outer layer with stainless-steel bands at 12-inch intervals.

3. Apply a skim coat of mineral-fiber, hydraulic-setting cement to insulation surface. When cement is dry, apply flood coat of lagging adhesive and press on one layer of glass cloth or tape. Overlap edges at least 1 inch. Apply finish coat of lagging adhesive over glass cloth or tape. Thin finish coat to achieve smooth, uniform finish.

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 block insulation of same material and thickness as pipe insulation.

4. Finish flange insulation same as pipe insulation.

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 insulation sections of insulation are not available, install mitered sections of calcium silicate insulation. Secure insulation materials with wire or bands.

3. Finish fittings insulation same as pipe insulation.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install mitered segments of calcium silicate insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.

2. Install insulation to flanges as specified for flange insulation application.

3. Finish valve and specialty insulation same as pipe insulation.

3.8 INSTALLATION OF CELLULAR-GLASS INSULATION

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 o.c.

4. For insulation with factory-applied jackets on below-ambient services, do not staple longitudinal tabs. Instead, 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, 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.

3.9 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

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.

3.10 INSTALLATION OF MINERAL-FIBER INSULATION

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. Instead, 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, 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.

3.11 INSTALLATION OF PHENOLIC INSULATION

A. General Installation Requirements:

1. Secure single-layer insulation with stainless-steel bands at 12-inch intervals and tighten bands without deforming insulation materials.

2. Install 2-layer insulation with joints tightly butted and staggered at least 3 inches. Secure inner layer with 0.062-inch wire spaced at 12-inch intervals. Secure outer layer with stainless-steel bands at 12-inch intervals.

B. 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 o.c.

4. For insulation with factory-applied jackets with vapor retarders on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

C. 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 block insulation of same material and thickness as pipe insulation.

D. 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.

E. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed insulation sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.

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 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.

3.13 FINISHES

A. Pipe Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below.

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. Testing Agency: For special inspections, City of New York will engage a qualified testing agency to perform tests and special inspections required by NYC Department of Buildings.

B. Perform tests and inspections.

C. Tests and Inspections:

1. 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, two locations of threaded strainers, two 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.

D. 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 Subcontractor's option.

B. Chilled Water and Brine, 40 Deg F and below:

1. Pipes 1-1/2 and Smaller: Insulation must be the following:
   a. Mineral-Fiber, Preformed Pipe, Type I: 2 inches thick.

2. Pipes 2 and larger: Insulation must be the following:
   a. Mineral-Fiber, Preformed Pipe, Type I 2 inches thick.
   b. Phenolic: 3 inches thick.

C. Refrigerant Suction and Hot-Gas Piping:

1. All Pipe Sizes: Insulation must be one of the following:
   a. Flexible Elastomeric: 1-1/2 inch thick.

3.16 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Subcontractor's option.

C. Piping, Exposed:

1. Aluminum, Smooth with Z-Shaped Locking Seam: 0.020 inch thick.

END OF SECTION 23 07 19

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. The work includes the providing of all labor, materials, equipment, accessories, services, and tests necessary to complete and place into satisfactory operation a complete system of automatic temperature controls as shown on the drawings and hereinafter specified.

B. The control system must include all necessary thermostats, damper motors, relays, etc., and all necessary equipment for a complete control system, regardless of whether or not specifically mentioned, including electric relays and contactors required for control interlocking.

C. The control system must include all control and interlock wiring from freeze stats, firestats and relays, to motor controllers, contactors, etc. All control circuits must be 120 volts.

D. Provide nameplates on all devices, whether or not mounted on the face of local control panels. In occupied areas, nameplates must be concealed beneath covers of room type instruments, to describe functions.

1.3 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

B. Only firms regularly engaged in the manufacture and installation of this equipment with characteristics and capacities required and whose products have been installed by them and are in satisfactory use in similar service for not less than 3 years will be acceptable.

C. The control system must be installed completely in all respects by properly trained mechanics, regularly employed by the manufacturer of the control system.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.5 SUBMITTALS

A. Submit shop drawings.

B. Complete shop drawings must be submitted to the Commissioner for approval before any field installation is started. Such drawings must give a complete description of all control elements and must show complete schematic piping and wiring diagrams, including functional descriptions. Valve and damper schedules must be included.

C. Floor plans indicating all room thermostat locations not shown on the Drawings, and samples of each type, must be prepared and submitted to the Commissioner for approval before installation. Samples of unitary controls must also be submitted for approval, and a typical assembly must be field erected, before installation. All room controls must be mounted five feet above the finished floor.

1.6 RELATED WORK UNDER ELECTRICAL WORK

A. All power wiring for pumps, fans, unit heaters, clocks, etc.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Instruments should provide accurate measurements of parameters such as temperature, humidity, pressure, and flow rate.
B. Instruments should have a range suitable for the expected operating conditions of the HVAC system.
C. Instruments should have sufficient resolution to detect small changes in the measured parameters.
D. Instruments should have a fast response time to changes in the system conditions.
E. Instruments should be reliable and able to operate continuously without frequent maintenance or calibration.
F. Instruments should integrate seamlessly with the overall HVAC control system for efficient operation.
G. Instruments should be able to log data for later analysis and troubleshooting.
H. Control systems should have logic capabilities to automate HVAC system operation based on predefined parameters and schedules.
I. Control systems should have a user-friendly interface for monitoring and adjusting system parameters.
J. Control systems should include safety features to protect the HVAC system and its components from damage or malfunction.
K. Control systems should be able to optimize energy use and minimize wastage through efficient control strategies.
L. Instruments and control systems should comply with relevant standards for HVAC systems.

2.2 CONTROL SYSTEM

A. The control system must be electric unless otherwise indicated, all as hereinafter specified. All controls must be the product of one manufacturer. The temperature control manufacturer must be responsible for the quality and satisfactory operation of material provided but not actually manufactured by them.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. MCC Powers
   b. Johnson Controls Inc.
   c. Honeywell, Inc.
   d. Or approved equal.

2.3 VALVE AND DAMPER OPERATORS

A. All operators must be of totally enclosed type in dustproof housings of pressed steel or approved cast metal. All motors must be of a permanently lubricated type with oil immersed gear train or internal servo relief valve. An open type gear train will not be acceptable. All operators must be of the spring return type, to provide failsafe operation and overtravel protection. Each automatic damper must be provided with a separate damper operator. Operators to be located outdoors must be NEMA 3R rated.

2.4 INSERTION AND IMMERSION THERMOSTATS

A. All thermostats must have adjustable throttling ranges and must be capable of positioning valve or damper operators in intermediate positions. The control elements of the thermostats must be centrally mounted inside the supply duct or casing to measure the air temperature. The sensing must be transmitted to the central mechanism located on the local control panel by means of capillary tubing or electronic transmission. Thermostats must be capable of controlling without hunting and must be respond to a change of plus or minus 3degF. The control point must be adjustable 15degF above and below the intended setting, with a minimum scale of at least 50degF. Sensing elements must be of proper design and material for its specific application and must have sufficient length to cover a minimum of two-thirds of the coil or duct.

2.5 DAMPERS

A. Control dampers must have galvanized frames of not less than 2" in width and blades of #16 galvanized steel and must be adequately braced to form a rigid assembly, where required in galvanized ductwork. In aluminum ductwork, damper material must be 16-gauge aluminum. No dampers must have blades more than 10" wide. Dampers must be painted with two coats of black enamel.

B. All dampers must be of the proportioning or opposed blade type. Dampers must have continuous stops to avoid leakage. Bearings must be of oilite nonferrous sleeve type. Outside air and exhaust air dampers must be provided with continuous neoprene gasketing around perimeter of frame and at interlocking blade edges, to form an airtight seal.

2.6 THERMOMETERS

A. Furnish and install dial thermometers with 1% range accuracy, on each local panel with appropriate temperature ranges, adjacent to each air insertion and water immersion controller. Thermometers must have a 32" dial, remote bulb, of liquid filled or electronic transmission type, uniform scale and same type sensing bulbs as thermostats. In addition, provide thermometers on local panels for the following:

1. O.A. temperature.
2. Return air temperature.
3. H.W. supply and return temperature.
4. Ch. W. supply and return temperature.
5. Air handling unit discharge
6. Each zone discharge air temperature

2.7 VALVES

A. All valves must be equipped with throttling plugs and removable composition discs. All valves must be sized by the control manufacturer and guaranteed to be of sufficient size to meet the heating and cooling requirements. All water valves must be sized for pressure drop and flow rates indicated on the drawings. All valves must be single seated.

2.8 ROOM THERMOSTATS

A. All proportioning thermostats must have an adjustable throttling range. All thermostats must be provided with an adjustable range of 55degF – 85degF., key operated, non-indicating, locked cover type. Finish and final locations must be approved by the Commissioner.

2.9 FREEZE PROTECTION DUCTSTATS

A. An electric freeze protection ductstat with 20 feet low temperature sensing capillary, and with manual reset, must be located across the discharge of each heating coil bank in each AC or HV unit, which must, on a fall in temperature below 35°F, shut down its respective supply fan and close the outdoor air damper. Case of instrument must be located outside of supply unit, within 10 feet of supply fan motor.

B. For systems with return air fans, on fan shut down, the return fan must continue running or must start, if not running.

2.10 FIRE PROTECTION DUCTSTATS

A. A manual reset fire protection ductstat must be provided in the air inlet to each return air fan, and exhaust fan within 10 feet of fan motor, to stop the return fan, exhaust fan, and its respective supply fan, whenever the temperature exceeds 125°F.

2.11 LOCAL PANELS

A. Furnish and install adjacent to each water system and each H & V unit and AC unit as herein specified, locked enclosed local control panel of 14 gauge steel or a face of plywood board with bonded aluminum sheets on each side set in an extruded aluminum enclosure and with welded angle iron brackets, wall or floor type, in which must be mounted the associated temperature controls, relays, thermostats, etc., and on which must be flush mounted the associated switches, gauges, thermometers, etc., as previously and hereinafter described. The basic background color of the panel must be as approved by the Commissioner. Provide canopy light on top of local control panel with light switch.

B. Panels must be prewired to terminal strips.

C. Details of the panel must be submitted for approval prior to fabrication. Locations of local panel are to be convenient for adjustment and service and all such locations are to be approved prior to installation. Provide engraved nameplates beneath panel mounted control device and gauge, clearly describing the function of said device and the range of operation. Provide a laminated color coded schematic control diagram on panel face. Provide a key for local panels.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSPECTION

A. Examine the location where controls and equipment are to be installed and determine space conditions and notify Commissioner in writing of conditions detrimental to proper and timely completion of the work.

B. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Install in accordance with the manufacturer's written instructions, and with recognized industry practices, to ensure that equipment complies with requirements and serve intended purposes.

B. Coordinate with other work as necessary to interface installation of equipment with other components of systems.

3.4 FIELD QUALITY CONTROL

A. Upon completion of installation of the automatic temperature control system and after motors have been energized with normal power source, test system to demonstrate compliance with requirement. When possible, field correct malfunctioning controls then retest to demonstrate compliance. Replace controls which cannot be satisfactorily corrected. Refer to Section 23 05 93 – Testing, Adjusting, and Balancing for HVAC.

3.5 DEMONSTRATION

A. After completion of the control system installation, the control manufacturer must regulate and adjust all thermostats, control valves, damper motors, etc., and place in complete operating condition, subject to the approval of the Commissioner. Complete instructions must be given to the operating personnel. There must be two days of instruction given for Winter cycle and two day's instruction for the Summer cycle operation.

END OF SECTION 23 09 00

SECTION 23 21 13 - HYDRONIC 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 pipe and fitting materials and joining methods for the following:
   1. Chilled-water piping.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.4 SUBMITTALS

A. Product Data: For each type of hydronic piping indicated.

B. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner’s review:

   1. Steel pipe and fittings
   2. Copper pipe and fittings
   3. RTRP and RTRF with adhesive.
   4. Pressure-seal fittings.
   5. Chemical treatment.

C. Qualification Data: For Installer.

D. Welding certificates.

E. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

B. Installer Qualifications:

1. Installers of Pressure-Sealed Joints: Subcontractor must be certified by pressure-seal joint manufacturer as having been instructed and qualified to join piping with pressure-seal pipe couplings and fittings.

C. Steel Support Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

D. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.

1. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Hydronic piping components and installation must be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:
1. Chilled-Water Piping: 250 psig at 200 deg F.

2.2 STEEL PIPE AND FITTINGS

A. Steel Pipe: ASTM A 53/A 53M, black steel with plain ends; welded and seamless, Grade B, and wall thickness as indicated in "Piping Applications" Article.

B. Cast-Iron Threaded Fittings: ASME B16.4; Classes 125 and 250 as indicated in "Piping Applications" Article.

C. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in "Piping Applications" Article.

D. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in "Piping Applications" Article.

E. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.1, Classes 25, 125, and 250; raised ground face, and bolt holes spot faced as indicated in "Piping Applications" Article.

F. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.

G. Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:

1. Material Group: 1.1.

2. End Connections: Butt welding.
3. Facings: Raised face.

H. Grooved Mechanical-Joint Fittings and Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Anvil International, Inc.
   b. Central Sprinkler Company.
   c. Star Pipe Products.
   d. Victaulic Company.
   e. Or approved equal.

2. Joint Fittings: ASTM A 536, Grade 65-45-12 ductile iron; ASTM A 47/A 47M, Grade 32510 malleable iron; ASTM A 53/A 53M, Type F, E, or S, Grade B fabricated steel; or ASTM A 106/A 106M, Grade B steel fittings with grooves or shoulders constructed to accept grooved-end couplings; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.
3. Couplings: Ductile- or malleable-iron housing and EPDM gasket of central cavity pressure-responsive design; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.

I. Steel Pressure-Seal Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. Victaulic Company.
   b. Anvil International, Inc.
   c. Star Pipe Products.
   d. Or approved equal.

2. Housing: Steel.
3. O-Rings and Pipe Stop: EPDM.
4. Tools: Manufacturer's special tool.
5. Minimum 300-psig working-pressure rating at 230 deg F.

J. Steel Pipe Nipples: ASTM A 733, made of same materials and wall thicknesses as pipe in which they are installed.

2.3 JOINING MATERIALS

A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch maximum thickness unless otherwise indicated.

a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

D. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

E. Gasket Material: Thickness, material, and type suitable for fluid to be handled and working temperatures and pressures.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PIPING APPLICATIONS

A. Chilled-water piping, aboveground, NPS 4 and smaller, must be any of the following:
1. Schedule 40 steel pipe.

B. Chilled-water piping, aboveground, NPS 5 to 10, must be any of the following:
1. Schedule 40 steel pipe, welded joints.
2. Schedule 40 steel pipe welded joints.

3.3 PIPING INSTALLATIONS

A. Drawing plans, schematics, and diagrams indicate the general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install all piping at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping to permit valve servicing.

F. Install piping at indicated slopes.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Install piping to allow application of insulation.

J. Select system components with pressure rating equal to or greater than system operating pressure.

K. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

L. Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.

M. Install piping at a uniform grade of 0.2 percent upward in direction of flow.

N. Reduce pipe sizes using eccentric reducer fitting installed with level side up.

O. Install branch connections to mains using mechanically formed tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.

P. Install valves according to Section 230523 "General-Duty Valves for HVAC Piping."

Q. Install unions in piping adjacent to valves, at final connections of equipment, and elsewhere as indicated.

R. Install flanges in piping and larger at final connections of equipment and elsewhere as indicated, see details.

S. Install shutoff valve immediately upstream of each dielectric fitting.

T. Install expansion loops, expansion joints, anchors, and pipe alignment guides.

U. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for identifying piping.

V. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

W. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

X. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.4 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric unions.

C. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric nipple.

D. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.5 HANGERS AND SUPPORTS

A. Comply with requirements in Section 230529 "Hangers and Supports for HVAC Piping and Equipment" for hanger, support, and anchor devices. Comply with the following requirements for maximum spacing of support.

B. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.
2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet or longer.
3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.
4. Spring hangers to support vertical runs.
5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
6. On plastic pipe, install pads or cushions on bearing surfaces to prevent hanger from scratching pipe.

C. Maximum Piping Support Schedule:

MAXIMUM PIPING SUPPORT SPACING		
Piping Material	**Maximum Horizontal Spacing (Ft.)**	**Maximum Vertical Spacing (Ft.)**
Cast iron pipe [a]	5	15
Copper or copper alloy pipe	12	10
Copper or copper alloy tubing: 1-1/4” and	6	10
Copper or copper alloy tubing: 1-1/2” and	10	10
CPVC pipe or tubing: 1” and smaller	3	10[b]
CPVC pipe or tubing: 1-1/4” and larger	4	10[b]
Steel pipe	12	15
Steel tubing	8	10

a. The maximum horizontal spacing of cast iron pipe hangers must be increased to 10 feet where 10-foot lengths of pipe are installed.
b. Mid-story guide.

D. Support vertical runs at roof, at each floor, and at 10-foot intervals between floors.

3.6 PIPE JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. 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.

D. 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/A5.8M.

E. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

F. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.

G. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

H. Plastic Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
3. PVC Pressure Piping: Join ASTM D 1785 schedule number, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule number PVC pipe and socket fittings according to ASTM D 2855.
4. PVC Nonpressure Piping: Join according to ASTM D 2855.

I. Grooved Joints: Assemble joints with coupling and gasket, lubricant, and bolts. Cut or roll grooves in ends of pipe based on pipe and coupling manufacturer's written instructions for pipe wall thickness. Use grooved-end fittings and rigid, grooved-end-pipe couplings.

3.7 FIELD QUALITY CONTROL

A. Prepare hydronic piping according to ASME B31.9 and as follows:

1. Leave joints, including welds, uninsulated and exposed for examination during test.
2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
3. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
4. Isolate equipment from piping. If a valve is used to isolate equipment, its closure must be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
5. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.

B. Perform the following tests on hydronic piping:

1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
2. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
3. Isolate expansion tanks and determine that hydronic system is full of water.
4. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure, but not less than 100 PSI. Test pressure must not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times the "SE" value in Appendix A in ASME B31.9, "Building Services Piping."
5. After hydrostatic test pressure has been applied for at least 2-hours, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
6. Prepare written report of testing.

C. Perform the following before operating the system:

1. Open manual valves fully.
2. Inspect pumps for proper rotation.
3. Set makeup pressure-reducing valves for required system pressure.
4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
5. Set temperature controls so all coils are calling for full flow.
6. Inspect and set operating temperatures of hydronic equipment, such as boilers, chillers, cooling towers, to specified values.
7. Verify lubrication of motors and bearings.

END OF SECTION 23 21 13

SECTION 23 21 16 - HYDRONIC 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 special-duty valves and specialties for the following:
   1. Chilled-water piping.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.4 SUBMITTALS

A. Product Data: For each type of hydronic piping specialty indicated.

B. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner’s review:

   1. Valves: Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.
   2. Air-control devices.
   3. Hydronic specialties.

C. Operation and Maintenance Data: For air-control devices, hydronic specialties, and special-duty valves to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

B. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.

1. Safety valves and pressure vessels must bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Hydronic piping components and installation must be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:
   1. Chilled-Water Piping: 250 psig at 200 deg F.
   2. Glycol Cooling-Water Piping: 25 psig at 200 deg F.
   3. Condensate-Drain Piping: 150 deg F.
   4. Blowdown-Drain Piping: 200 deg F.
   5. Air-Vent Piping: 200 deg F.
   6. Safety-Valve-Inlet and -Outlet Piping: Equal to the pressure of the piping system to which it is attached.

2.2 VALVES

A. Gate, Globe, Check, Ball, and Butterfly Valves: Comply with requirements specified in Section 230523 "General-Duty Valves for HVAC Piping.".

B. Automatic Temperature-Control Valves, Actuators, and Sensors: Comply with requirements specified in Section 230900 "Instrumentation and Control for HVAC".

2.3 AIR-CONTROL DEVICES

A. Automatic Air Vents:

   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      a. AMTROL, Inc.
      b. Armstrong Pumps, Inc.
      c. Bell & Gossett Domestic Pump.
      d. Nexus Valve, Inc.
      e. Taco, Inc.
      f. Or approved equal.

   2. Body: Bronze or cast iron.
   3. Internal Parts: Nonferrous.
   4. Operator: Noncorrosive metal float.
   5. Inlet Connection: NPS 1/2 (DN 15).
   6. Discharge Connection: NPS 1/4 (DN 8).

7. CWP Rating: 250 psig (1035 kPa).
8. Maximum Operating Temperature: 240 deg F (116 deg C).

2.4 HYDRONIC PIPING SPECIALTIES

A. Y-Pattern Strainers:

1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
2. End Connections: Threaded ends for NPS 2 (DN 50) and smaller; flanged ends for NPS 2-1/2 (DN 65) and larger.
3. Strainer Screen: Stainless-steel, 60-mesh strainer or perforated stainless-steel basket.
4. CWP Rating: 250 psig.

B. Basket Strainers:

1. Body: ASTM A 126, Class B, high-tensile cast iron with bolted cover and bottom drain connection.
2. End Connections: Threaded ends for NPS 2 (DN 50) and smaller; flanged ends for NPS 2-1/2 (DN 65) and larger.
3. Strainer Screen: 60-mesh startup strainer and perforated stainless-steel basket with 50 percent free area.
4. CWP Rating: 125 psig.

C. T-Pattern Strainers:

1. Body: Ductile or malleable iron with removable access coupling and end cap for strainer maintenance.
2. End Connections: Grooved ends.
3. Strainer Screen: 60-mesh startup strainer, and perforated stainless-steel basket with 57 percent free area.
4. CWP Rating: 750 psig.

D. Stainless-Steel Bellow, Flexible Connectors:

1. Body: Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket.
2. End Connections: Threaded or flanged to match equipment connected.
3. Performance: Capable of 3/4-inch (20-mm) misalignment.
4. CWP Rating: 150 psig.
5. Maximum Operating Temperature: 250 deg F.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 VALVE APPLICATIONS

A. Install shut off-duty valves at each branch connection to supply mains and at supply connection to each piece of equipment.

3.3 HYDRONIC SPECIALTIES INSTALLATION

A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.

B. Install automatic air vents at high points of system piping in mechanical equipment rooms only. Install manual vents at heat-transfer coils and elsewhere as required for air venting.

END OF SECTION 23 21 16

SECTION 23 23 00 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. This Section includes refrigerant piping used for air-conditioning applications.

1.3 PERFORMANCE REQUIREMENTS

A. Line Test Pressure for Refrigerant R-22:

1. Suction Lines for Air-Conditioning Applications: 115 psig.
2. Suction Lines for Heat-Pump Applications: 225 psig.
3. Hot-Gas and Liquid Lines: 225 psig.

B. Line Test Pressure for Refrigerant R-410A:

1. Suction Lines for Air-Conditioning Applications: 300 psig.
2. Suction Lines for Heat-Pump Applications: 535 psig.
3. Hot-Gas and Liquid Lines: 535 psig.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.5 SUBMITTALS

A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop, based on manufacturer's test data, for the following:

B. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner’s review:

1. Thermostatic expansion valves.
2. Solenoid valves.
3. Hot-gas bypass valves.
4. Filter dryers.
5. Strainers.

6. Pressure-regulating valves.

C. Welding certificates.

D. Field quality-control test reports.

E. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

B. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

C. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."

D. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.7 PRODUCT STORAGE AND HANDLING

A. Store piping in a clean and protected area with end caps in place to ensure that piping interior and exterior are clean when installed.

1.8 COORDINATION

A. Coordinate size and location of roof curbs, equipment supports, and roof penetrations.

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. Soft copper tubing is not allowed.

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 VALVES AND SPECIALTIES

A. Diaphragm Packless Valves:

1. Body and Bonnet: Forged brass or cast bronze; globe design with straight-through or angle pattern.
2. Diaphragm: Phosphor bronze and stainless steel with stainless-steel spring.
3. Operator: Rising stem and hand wheel.
4. Seat: Nylon.
5. End Connections: Socket, union, or flanged.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 275 deg F.

B. Packed-Angle Valves:

1. Body and Bonnet: Forged brass or cast bronze.
2. Packing: Molded stem, back seating, and replaceable under pressure.
3. Operator: Rising stem.
4. Seat: Nonrotating, self-aligning polytetrafluoroethylene.
5. Seal Cap: Forged-brass or valox hex cap.
6. End Connections: Socket, union, threaded, or flanged.
7. Working Pressure Rating: 500 psig.
8. Maximum Operating Temperature: 275 deg F.

C. Check Valves:

1. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
2. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.
3. Piston: Removable polytetrafluoroethylene seat.
4. Closing Spring: Stainless steel.
5. Manual Opening Stem: Seal cap, plated-steel stem, and graphite seal.
6. End Connections: Socket, union, threaded, or flanged.
7. Maximum Opening Pressure: 0.50 psig.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 275 deg F.

D. Service Valves:

1. Body: Forged brass with brass cap including key end to remove core.
2. Core: Removable ball-type check valve with stainless-steel spring.

3. Seat: Polytetrafluoroethylene.
4. End Connections: Copper spring.
5. Working Pressure Rating: 500 psig.

E. Solenoid Valves: Comply with ARI 760 and UL 429; listed and labeled by an NRTL.

1. Body and Bonnet: Plated steel.
2. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Threaded.
5. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter, and 24-V ac coil.
6. Working Pressure Rating: 400 psig.
7. Maximum Operating Temperature: 240 deg F.
8. Manual operator.

F. Safety Relief Valves: Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.

1. Body and Bonnet: Ductile iron and steel, with neoprene O-ring seal.
2. Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Seat Disc: Polytetrafluoroethylene.
4. End Connections: Threaded.
5. Working Pressure Rating: 400 psig.
6. Maximum Operating Temperature: 240 deg F.

G. Thermostatic Expansion Valves: Comply with ARI 750.

1. Body, Bonnet, and Seal Cap: Forged brass or steel.
2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Packing and Gaskets: Non-asbestos.
4. Capillary and Bulb: Copper tubing filled with refrigerant charge.
5. Suction Temperature: 40 deg F.
6. Superheat: Adjustable.
7. Reverse-flow option (for heat-pump applications).
8. End Connections: Socket, flare, or threaded union.
9. Working Pressure Rating: 700 psig.

H. Hot-Gas Bypass Valves: Comply with UL 429; listed and labeled by an NRTL.

1. Body, Bonnet, and Seal Cap: Ductile iron or steel.
2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Packing and Gaskets: Non-asbestos.
4. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
5. Seat: Polytetrafluoroethylene.
6. Equalizer: Internal.
7. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter, and 24-V ac coil.

8. End Connections: Socket.
9. Set Pressure:
10. Throttling Range: Maximum 5 psig.
11. Working Pressure Rating: 500 psig.
12. Maximum Operating Temperature: 240 deg F.

I. Straight-Type Strainers:

1. Body: Welded steel with corrosion-resistant coating.
2. Screen: 100-mesh stainless steel.
3. End Connections: Socket or flare.
4. Working Pressure Rating: 500 psig.
5. Maximum Operating Temperature: 275 deg F.

J. Angle-Type Strainers:

1. Body: Forged brass or cast bronze.
2. Drain Plug: Brass hex plug.
3. Screen: 100-mesh monel.
4. End Connections: Socket or flare.
5. Working Pressure Rating: 500 psig.
6. Maximum Operating Temperature: 275 deg F.

K. Moisture/Liquid Indicators:

1. Body: Forged brass.
2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
3. Indicator: Color coded to show moisture content in ppm.
4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
5. End Connections: Socket or flare.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 240 deg F.

L. Replaceable-Core Filter Dryers: Comply with ARI 730.

1. Body and Cover: Painted-steel shell with ductile-iron cover, stainless-steel screws, and neoprene gaskets.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
3. Desiccant Media: Activated alumina.
4. Designed for reverse flow (for heat-pump applications).
5. End Connections: Socket.
6. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
7. Maximum Pressure Loss: 2 psig.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 240 deg F.

M. Permanent Filter Dryers: Comply with ARI 730.

1. Body and Cover: Painted-steel shell.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
3. Desiccant Media: Activated alumina, charcoal.
4. Designed for reverse flow (for heat-pump applications).
5. End Connections: Socket.
6. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
7. Maximum Pressure Loss: 2 psig.
8. Rated Flow: see schedule
9. Working Pressure Rating: 500 psig.
10. Maximum Operating Temperature: 240 deg F.

N. Mufflers:

1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket or flare.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg F.

O. Receivers: Comply with ARI 495.

1. Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
2. Comply with UL 207; listed and labeled by an NRTL.
3. Body: Welded steel with corrosion-resistant coating.
4. Tappings: Inlet, outlet, liquid level indicator, and safety relief valve.
5. End Connections: Socket or threaded.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 275 deg F.

P. Liquid Accumulators: Comply with ARI 495.

1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket or threaded.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg F.

2.3 REFRIGERANTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Atofina Chemicals, Inc.
2. DuPont Company; Fluorochemicals Div.
3. Honeywell, Inc.; Genetron Refrigerants.
4. INEOS Fluor Americas LLC.
5. Or approved equal.

B. ASHRAE 34, R-22: Monochlorodifluoromethane.

C. ASHRAE 34, R-410A: Pentafluoroethane/Difluoromethane.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PIPING APPLICATIONS FOR REFRIGERANT R-410A

A. Suction Lines NPS 1-1/2 (DN 40) and Smaller for Conventional Air-Conditioning Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed joints.

B. Suction Lines NPS 2 to NPS 3-1/2 (DN 50 to DN 90) for Conventional Air-Conditioning Applications: Copper, Type ACR, drawn-temper tubing and wrought-copper fittings with brazed joints.

C. Suction Lines NPS 4 (DN 100) and higher for Conventional Air-Conditioning Applications: Copper, Type ACR, drawn-temper tubing and wrought-copper fittings with brazed joints.

D. Hot-Gas and Liquid Lines:
   1. NPS 1 1/4 (DN 40) and Smaller: Copper, Type ACR, drawn-temper tubing and wrought-copper fittings with 95-5 tin-antimony soldered joints.
   2. NPS 1-1/2 to NPS 2 (DN 40 to DN 50): Copper, Type ACR, drawn-temper tubing and wrought-copper fittings with Alloy HB soldered joints.

E. Safety-Relief-Valve Discharge Piping: Copper, Type ACR, annealed- or drawn-temper tubing and wrought-copper fittings with brazed joints.

3.3 VALVE AND SPECIALTY APPLICATIONS

A. Install packed-angle valves in suction and discharge lines of compressor.

B. Install service valves for gage taps at inlet and outlet of hot-gas bypass valves and strainers if they are not an integral part of valves and strainers.

C. Install a check valve at the compressor discharge and a liquid accumulator at the compressor suction connection.

D. Except as otherwise indicated, install packed-angle valves on inlet and outlet side of filter dryers.

E. Install a full-sized, three-valve bypass around filter dryers.

F. Install solenoid valves upstream from each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at top.

G. Install thermostatic expansion valves as close as possible to distributors on evaporators.

1. Install valve so diaphragm case is warmer than bulb.
2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line.
3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.

H. Installing safety relief valves where required by ASME Boiler and Pressure Vessel Code. Pipe safety-relief-valve discharge line to outside according to ASHRAE 15.

I. Install moisture/liquid indicators in liquid line at the inlet of the thermostatic expansion valve or at the inlet of the evaporator coil capillary tube.

J. Install strainers upstream from and adjacent to the following unless they are furnished as an integral assembly for device being protected:

1. Solenoid valves.
2. Thermostatic expansion valves.
3. Hot-gas bypass valves.
4. Compressor.

K. Install filter dryers in liquid line between compressor and thermostatic expansion valve, and in the suction line at the compressor.

L. Install receivers sized to accommodate pump-down charge.

M. Install flexible connectors at compressors.

3.4 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

B. Install refrigerant piping according to ASHRAE 15.

C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping adjacent to machines to allow service and maintenance.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Select system components with pressure rating equal to or greater than system operating pressure.

J. Refer to Section 230900 "Instrumentation and Control for HVAC" for solenoid valve controllers, control wiring.

K. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.

L. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection.

M. Install refrigerant piping in protective conduit where installed belowground.

N. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.

O. 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.

P. 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.

Q. Before installation of steel refrigerant piping, clean pipe and fittings using the following procedures:

1. Shot blast the interior of piping.
2. Remove coarse particles of dirt and dust by drawing a clean, lintless cloth through tubing by means of a wire or electrician's tape.
3. Draw a clean, lintless cloth saturated with trichloroethylene through the tube or pipe. Continue this procedure until cloth is not discolored by dirt.

4. Draw a clean, lintless cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.
5. Finally, draw a clean, dry, lintless cloth through the tube or pipe.
6. Safety-relief-valve discharge piping is not required to be cleaned but is required to be open to allow unrestricted flow.

R. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.

S. Identify refrigerant piping and valves according to Section 230553 "Identification for HVAC Piping and Equipment."

T. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

U. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

V. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.5 PIPE JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide), during brazing or welding, to prevent scale formation.

D. Soldered Joints: Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook."

E. 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.
2. Use Type BAg, cadmium-free silver alloy for joining copper with bronze or steel.

3.6 HANGERS AND SUPPORTS

A. Hanger, support, and anchor products are specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

B. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet (6 m) long.
2. Roller hangers and spring hangers for individual horizontal runs 20 feet (6 m) or longer.
3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet (6 m) or longer, supported on a trapeze.
4. Spring hangers to support vertical runs.
5. 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 1/2 (DN 15): Maximum span, 60 inches (1500 mm); minimum rod size, 1/4 inch (6.4 mm).
2. NPS 5/8 (DN 18): Maximum span, 60 inches (1500 mm); minimum rod size, 1/4 inch (6.4 mm).
3. NPS 1 (DN 25): Maximum span, 72 inches (1800 mm); minimum rod size, 1/4 inch (6.4 mm).
4. NPS 1-1/4 (DN 32): Maximum span, 96 inches (2400 mm); minimum rod size, 3/8 inch (9.5 mm).
5. NPS 1-1/2 (DN 40): Maximum span, 96 inches (2400 mm); minimum rod size, 3/8 inch (9.5 mm).
6. NPS 2 (DN 50): Maximum span, 96 inches (2400 mm); minimum rod size, 3/8 inch (9.5 mm).
7. NPS 2-1/2 (DN 65): Maximum span, 108 inches (2700 mm); minimum rod size, 3/8 inch (9.5 mm).
8. NPS 3 (DN 80): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch (9.5 mm).
9. NPS 4 (DN 100): Maximum span, 12 feet (3.7 m); minimum rod size, 1/2 inch (13 mm).

D. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:

1. NPS 2 (DN 50): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch (9.5 mm).
2. NPS 2-1/2 (DN 65): Maximum span, 11 feet (3.4 m); minimum rod size, 3/8 inch (9.5 mm).
3. NPS 3 (DN 80): Maximum span, 12 feet (3.7 m); minimum rod size, 3/8 inch (9.5 mm).
4. NPS 4 (DN 100): Maximum span, 14 feet (4.3 m); minimum rod size, 1/2 inch (13 mm).

E. Support multifloor vertical runs at least at each floor.

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, specialties, and receivers. 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 micrometers (67 Pa). If vacuum holds for 12 hours, system is ready for charging.
3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig (14 kPa).
4. Charge system with a new filter-dryer core in charging line.

3.9 ADJUSTING

A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.

B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.

C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.

D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:

1. Open shutoff valves in condenser water circuit.
2. Verify that compressor oil level is correct.
3. Open compressor suction and discharge valves.
4. Open refrigerant valves except bypass valves that are used for other purposes.
5. Check open compressor-motor alignment and verify lubrication for motors and bearings.

E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION 23 23 00

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. Single-wall rectangular ducts and fittings.
2. Double-wall rectangular ducts and fittings.
3. Sheet metal materials.
4. Duct liner.
5. Sealants and gaskets.
6. Hangers and supports.

B. Related Sections:

1. Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
2. Section 233300 "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.3 REFERENCE STANDARDS

A. ASTM International (ASTM).

B. American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE).

C. North American Insulation Manufacturers Association (NAIMA).

D. National Fire Protection Association (NFPA).

E. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).

F. Underwriters Laboratories (UL).

G. Underwriters Laboratories Environmental (UL Environment).

1.4 DEFINITIONS

A. Thermal Conductivity (K value): Units of Btu-inch/hour per square foot per degree F.

B. UL GREENGUARD: Provides independent third-party, Indoor Air Quality (IAQ) certification of products for emissions of respirable particles and Volatile Organic Compounds (VOC's), including formaldehyde and other specific product-related pollutants. Certification is based upon criteria used by EPA, OSHA, and WHO.

C. EPA: Environmental Protection Agency.

D. WHO: World Health Organization.

E. ASJ: All Service Jacket composed of aluminum foil reinforced with glass scrim bonded to a kraft paper interleaving with an outer film layer leaving no paper exposed.

F. ASJ: All Service Jacket (no outer film).

G. SSL: Self-Sealing Lap with Advanced Closure System.

H. SSL: Self-Sealing Lap.

I. FSK: Foil Scrim Kraft; jacketing.

J. PSK: Poly Scrim Kraft; jacketing.

K. PVC: Polyvinyl Chloride.

L. Glass Mineral Wool: Interchangeable with fiber glass but replacing the term in the attempt to disassociate and differentiate Glass Mineral Wool from the potential health and safety risk of special purpose or reinforcement products that do not meet the bio solubility criteria of insulation made from glass. Rock Mineral Wool will replace the traditional Mineral Wool label. Both are used in lieu of the Mineral Fiber label.

M. UL Environment Formaldehyde Free Verification Requirements: For a product to be verified as formaldehyde free, product samples must have a measured emission factor of less than or equal to 5 $\mu g/m^2h$ at 24 elapsed hours or 3 $\mu g/m^2h$ at 336 elapsed hours. An emission factor of 5 $\mu g/m^2h$ corresponds to measured chamber concentration of 2.5 $\mu g/m^3$ for a typical building ratio of 0.5 m^2/m^3. This chamber concentration is comparable to, or below typical outdoor air concentrations. This demonstrates that the formaldehyde exposure from products labeled as formaldehyde free will not contribute to airborne formaldehyde concentrations at greater levels than those found in the natural outdoor environment.

1.5 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".

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.7 SUBMITTALS

A. Product Data: For each type of the following products:

B. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner’s areview:

1. Liners and adhesives.
2. Sealants and gaskets.

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. 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 indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.

E. Field quality-control reports.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

PART 2 - PRODUCTS

2.1 SINGLE-WALL 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 2-1, "Rectangular Duct/Transverse 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 2-2, "Rectangular Duct/Longitudinal Seams," 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 4, "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 DOUBLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. McGill AirFlow LLC.
2. Sheet Metal Connectors, Inc.
3. Corken Steel
4. Or approved equal

B. Rectangular Ducts: Fabricate ducts with indicated dimensions for the inner duct.

C. Outer Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

D. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse 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."

E. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," 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."

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Knauf Insulation; Sonic XP Duct Liner with ECOSE Technology
   b. CertainTeed Corporation; Insulation Group.
   c. Johns Manville.
   d. Owens Corning.
   e. Or approved equal

2. Maximum Thermal Conductivity: 0.23 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.
3. Install spacers that position the inner duct at uniform distance from outer duct without compressing insulation.
4. Provide antimicrobial coating on duct liner.

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: G60.
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. Carbon-Steel Sheets: Comply with ASTM A 1008/A 1008M, with oiled, matte finish for exposed ducts.

D. Factory- or Shop-Applied Antimicrobial Coating:

1. Apply to the surface of sheet metal that will form the interior surface of the duct. An untreated clear coating must be applied to the exterior surface.
2. Antimicrobial compound must be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
3. Coating containing the antimicrobial compound must have a hardness of 2H, minimum, when tested according to ASTM D 3363.
4. Surface-Burning Characteristics: Maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
5. Shop-Applied Coating Color: White or Black

6. Antimicrobial coating on sheet metal is not required for duct containing liner treated with antimicrobial coating.

E. 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.

F. 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 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: 6 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.

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, 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. Solvent-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Base: Synthetic rubber resin.
3. Solvent: Toluene and heptane.
4. Solids Content: Minimum 60 percent.
5. Shore A Hardness: Minimum 60.
6. Water resistant.
7. Mold and mildew resistant.

2.5 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.

C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."

D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

E. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.

F. 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.

G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

H. 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 galvanized steel coated with zinc chromate.

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 ducts with fewest possible joints.

D. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

E. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

G. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

H. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.

I. 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.

J. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Section 233300 "Air Duct Accessories" for fire and smoke dampers.

K. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "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 a two-part tape sealing system.

C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.

D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

E. Repair 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. Ductwork must be constructed and erected in accordance with the 2022 New York City Mechanical Code, Section C403.2.7.
   1. Low Pressure Ductwork Systems – All longitudinal and transverse joints, seams and connections of supply and return ducts operating at a static pressure less than or equal to 2-inches w.g. must be securely fastened and sealed with welds, gaskets, mastics, mastic plus embedded fabric systems or tapes installed in accordance with the manufacturer's installation instructions.
   2. Medium Pressure Duct Systems – All ducts and plenums operating at a static pressure greater than 2-inches w.g. but less than 3-inches w.g. must be insulated and sealed as per the schedule below.
   3. High Pressure Duct Systems – Ducts designed to operate at a static pressure greater than 3-inches w.g. must be insulated and sealed as per the schedule below.

C. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and the 2022 New York City Energy Conservation Code:

   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 and Lower: Seal Class B.
   6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: 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 5, "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.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports.

E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.

F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.6 CONNECTIONS

A. Make connections to equipment with flexible connectors complying with Section 233300 "Air Duct Accessories."

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Leakage Tests:

1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.

a. Supply Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Commissioner from sections installed, totaling no less than 100 percent of total installed duct area for each designated pressure class.
b. Return Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Commissioner from sections installed, totaling no less than 100 percent of total installed duct area for each designated pressure class.
c. Outdoor Air Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Commissioner from sections installed, totaling no less than 100 percent of total installed duct area for each designated pressure class.

2. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
3. Test for leaks before applying external insulation.
4. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
5. Give seven days' advance notice for testing.

C. Duct system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.8 START UP

A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

3.9 DUCT SCHEDULE

A. Fabricate ducts with galvanized sheet steel

B. Supply Ducts:

a. Pressure Class: Positive 2-inch wg.
1) Minimum SMACNA Seal Class: A.
2) SMACNA Leakage Class for Rectangular: 6.
3) SMACNA Leakage Class for Round and Flat Oval: 3.

C. Return Ducts:

a. Pressure Class: Positive 2-inch wg.
1) Minimum SMACNA Seal Class: A.
2) SMACNA Leakage Class for Rectangular: 6.
3) SMACNA Leakage Class for Round and Flat Oval: 3.

D. Liner:

1. Provide acoustically lined duct where listed below and/or as shown on the drawings:

   a. Within a minimum of 20 feet of all AC unit discharges.

   b. Within a minimum of 20 feet of fan inlet and discharges.

2. Supply Air Ducts: Fibrous glass, Type II 1 inch thick.
3. Return Air Ducts: Fibrous glass, Type II 1 inch thick.

E. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."

   a. Velocity 1000 to 1500 fpm:

      1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.
      2) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

   b. Velocity 1500 fpm or Higher:

      1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
      2) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

2. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."

   a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
   b. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

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. Control dampers.
   2. Smoke dampers.
   3. Combination fire and smoke dampers.
   4. Turning vanes.
   5. Remote damper operators.
   6. Duct-mounted access doors.
   7. Duct accessory hardware.

B. Related Requirements:

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.4 SUBMITTALS

A. 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. Control-damper installations.
      c. Fire-damper, smoke-damper, combination fire- and smoke-damper, ceiling, and corridor damper installations, including sleeves; and duct-mounted access doors and remote damper operators.

B. Source quality-control reports.

C. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 01400 “Quality Requirements.”

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessories should be made from durable materials suitable for the intended application, such as galvanized steel, or aluminum.

B. Dampers should provide accurate and reliable control of airflow, with minimal leakage when closed.

C. Accessories should be designed to minimize noise transmission through the ductwork, ensuring quiet operation.

D. Accessories should be easy to install and compatible with standard duct sizes and configurations.

E. Accessories should be designed to minimize pressure drop and energy loss, contributing to the overall efficiency of the HVAC system.

2.2 ASSEMBLY DESCRIPTION

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

B. 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.

2.3 MATERIALS

A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G60.
2. Exposed-Surface Finish: Mill phosphatized.

B. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

C. 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 CONTROL DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Greenheck.
2. Cesco Products; a division of Mestek, Inc.
3. Lloyd Industries, Inc.
4. Metal Form Manufacturing, Inc.
5. Nailor Industries Inc.
6. NCA Manufacturing, Inc.
7. Pottorff.
8. Ruskin Company.
9. Or approved equal.

B. Ratings:
1. Temperature Rating: -25ºF to 180ºF.
2. Leakage: 8.0 cfm/ft^2 @ 4.0 in.wg. or 4.0 cfm/ft^2 @ 1.0 in.wg., with low leakage seals.
3. Maximum Velocity: 3000 fpm (15.2 m/s)
4. Differential Pressure Rating: 5 in.wg. at a 12-inch blade length

C. Low-leakage rating**,** with linkage concealed in frame, and bearing AMCA's Certified Ratings Seal for both air performance and air leakage.

D. Frames:
1. Hat-shaped channel, roll formed galvanized steel with interlocking gusseted corners. Structurally equivalent to 13-gauge U-channel type frame. Low profile head and sill on sizes less than 13 inches high.

E. Blades:
1. 6-inch x 16 gauge (152 x 1.5 mm) maximum width.
2. Galvanized steel 3-V.
3. Opposed-blade design.
4. Blade Edging: Extruded PVC blade edge.

F. Jamb Seals: Stainless steel, flexible metal compression type

G. Blade Axles: Minimum ½" (13mm) diameter plated steel hex-shaped, mechanically attached to blade.

H. Bearings:

1. Synthetic sleeve-type turning in extruded hole in frame.
2. Dampers in ducts with pressure classes of 3-inch wg or less must have axles full length of damper blades and bearings at both ends of operating shaft.
3. Thrust bearings at each end of every blade.

I. Finish: stainless steel

J. Accessories:
1. Actuator:
   a. Type:
      1) Electric 120 V, 60 Hz, two-position, fail close.
      2) Electric 24V, 60 Hz, two-position, fail close.
      3) Electric 230 V, 50/60 Hz, two-position, fail close.
      4) Pneumatic, 20 to 30 psi supply pressure, two-position , fail close.

   b. Mounting:
      1) External side plate.
      2) Internal
2. Flange Frame. 1 ½ inches both sides.
3. Factory Sleeve. Minimum 20-gauge, factory installed.
4. Duct Transition Connections: Rectangular

2.5 THERMAL ISOLATION CONTROL DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Greenheck.
2. Ruskin
3. Johnson Controls
4. Or approved equal.

B. Ratings
1. Leakage:

   a. Dampers must have a maximum leakage of Class 1 @ 4 in. wg or Class 1A @ 1 in. wg as defined by AMCA (Leakage class 1 is defined as 8 cfm/ sq. ft. @ 4 in. wg and class 1A is defined as 3 cfm/ sq. ft. @ 1 in. wg. at -40°F). Tested in accordance with AMCA standard 500-D.

b. Damper must meet or exceed the IECC (International Energy Conservation Code) requirements for damper leakage ratings of 3 cfm per sq. ft. @ 1 in. wg or 8 cfm per sq. ft @ 4 in. wg or less when integral to the building envelope.

2. Differential Pressure:
   a. Dampers must have a maximum differential pressure rating of 10 in. wg.

3. Velocity:
   a. Dampers must have a maximum velocity rating of 4000 fpm (20.32 m/s).

C. Construction:
   1. Frame:

      a. On ICD-44 damper frame must be aluminum formed into a 5" x 1" structural hat channel. Top and bottom frame members on dampers less than 17" high must be low profile design to maximize the free area of these smaller dampers. Frame must be 4-piece construction with 1 ½" (minimum) integral overlapping gusset reinforcements in each corner to assure square corners and provide maximum resistance to racking.

      b. Optional frame types:
         1) Quick connect damper frame must be aluminum formed into a 4" x 1" structural hat channel with a 0.125 in. minimum wall thickness.
         2) Single side flange applies a 1-1/2" flange to the actuator side of the damper frame.
         3) Single reversed side flange applies a 1-1/2" flange to the side opposite the actuator.

   2. Blades:

      a. Blades: Damper blades must be heavy gauge extruded aluminum airfoil shape with metal blade to blade overlap. Each blade must be symmetrical relative to its axle pivot point, presenting identical performance characteristics with air flowing in either direction through the damper. Blade orientation is horizontal, and operation is parallel or opposed. Polyurethane foam fills the airfoil blade cavity giving the blade its thermal transfer properties. Ends of blade have a thermal break to isolate the transfer of heat/cold through the aluminum material from one side of the blade to the other.

   3. Blade Stops: Each blade stop (at top and bottom of damper frame) must occupy no more than ½" of the damper opening area to allow for maximum free area and to minimize pressure loss across the damper.

   4. Seals:
      a. Blade Edge: Silicone blade seals come standard which are mechanically fastened to each blade.
      b. Jamb seal: 304SS is standard. Silicone is optional.

5. Linkage: Concealed in frame out of the airstream, plated steel material.

6. Axles: Minimum ½ inch dia. plated steel. Stainless steel axle is optional. Removable control shaft extends 6" beyond the damper frame.

7. Bearings: Dual bearing with acetal inner sleeve, flanged outer bearing resulting in no metal-to-metal or metal-to-plastic contact.

8. Finish: Mill Aluminum finish is standard.

9. Temperature Rating: -70° F to 200° F (-57° C to 93° C).

10. Mounting: The ICD-44 is suitable for vertical and horizontal applications.

11. Options: Low leakage, thermal isolation will be provided from the factory with requested options such as actuators, frame type, blade action, etc.

D. Accessories

1. Actuators:
   a. Type:
      1) Manual quadrant
      2) Electric, 120V AC, 2-position
      3) Electric, 24V AC, 2-position
      4) Electric, 230V AC, 2-position

   b. Mounting:
      1) External
      2) Internal

2. Flange Frame:
   a. 1-1/2 inches rolled formed as part of frame.

2.6 FIRE DAMPERS

A. References
1. AMCA 500-D – Laboratory Test Methods for Testing Dampers for Ratings.
2. AMCA 511 - Certified Ratings Program for Air Control Devices.
3. IBC – International Building Code.
4. CSFM - California State Fire Marshall Listing for Fire Damper.
5. MEA – City of New York, Department of Buildings, Material and Acceptance Division.
6. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
7. NFPA 101 – Life Safety Code.

8. UL 555 - Standard for Safety; Fire Dampers

B. Quality Assurance
   1. Dampers must be tested, rated and labeled in accordance with the latest UL-555 requirements.
   2. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
   3. Damper pressure drop ratings must be based on tests and procedures performed in accordance with AMCA 500.

C. Fire Rating:
   1. 1½ hours in accordance with UL-555: VFD-10 Series (Static)
   2. 3 hours in accordance with UL-555: VFD-30 Series (Static)
   3. 1½ hours in accordance with UL-555: VFD-10-D Series (Dynamic)
   4. 3 hours in accordance with UL-555: VFD-30-D Series (Dynamic)

D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   1. Air Balance Inc.; a division of Mestek, Inc.
   2. Arrow United Industries; a division of Mestek, Inc.
   3. Cesco Products; a division of Mestek, Inc.
   4. Greenheck Fan Corporation.
   5. Nailor Industries Inc.
   6. NCA Manufacturing, Inc.
   7. Pottorff.
   8. Ruskin Company.
   9. Or approved equal.

E. Type: Static and dynamic; rated and labeled according to UL 555 by an NRTL.

F. Closing rating in ducts up to 4-inch wg static pressure class and minimum 3000-4,000 fpm velocity.

G. Frame: Curtain type with blades outside airstream; Minimum 22 gauge roll formed, galvanized steel; with mitered and interlocking corners.

H. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.
   1. Minimum Thickness: Minimum 20 gauge integral to frame, and of length to suit application.

I. Mounting Orientation: Vertical or horizontal as indicated.

J. Blades: Minimum 24 gauge roll formed galvanized steel, curtain type.

K. Horizontal Dampers: Include blade lock and stainless-steel closure spring.

L. Heat-Responsive Device: Replaceable, (165 deg F) rated, fusible links.

M. Accessories:
1. Retaining Angles:
a. SSPF-20, 1 ½ x ¾ inches x 20-gauge single side picture frame.
b. SSPF-16, 1 ½ x 1 ½ inches x 16-gauge single side picture frame.
c. DSPF-16, 1 ½ x 1 ½ inches x 16-gauge dual side picture frame.
d. SS-16, 1 ½ x 1 ½ inches x 16-gauge single side, individual.
e. DS-16, 1 ½ x 1 ½ inches x 16-gauge dual side, individual.

2.7 SMOKE DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Pottorff.
2. Air Balance Inc.; a division of Mestek, Inc.
3. Cesco Products; a division of Mestek, Inc.
4. Greenheck Fan Corporation.
5. Nailor Industries Inc.
6. Ruskin Company.
7. Or approved equal.

B. References:
1. Label according to UL 555S by an NRTL.
2. AMCA 500-D – Laboratory Test Methods for Testing Dampers for Ratings.
3. AMCA 511 - Certified Ratings Program for Air Control Devices.
4. IBC – International Building Code.
5. CSFM - California State Fire Marshall Listing for Smoke Damper.
6. MEA – City of New York, Department of Buildings, Material and Acceptance Division.
7. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
8. NFPA 92A - Smoke-Control Systems.
9. NFPA 92B – Smoke Control Systems in Atria, Covered Malls, and Large Areas.
10. NFPA 101 – Life Safety Code.

C. Ratings:
1. Smoke Rating: Leakage in accordance with UL-555S.
a. SD-141 – Leakage Class-1 8 cfm/ft^2 at 4 in.wg.
b. SD-142 – Leakage Class-2 20 cfm/ft^2 at 4 in.wg.
c. SD-143 – Leakage Class-3 80 cfm/ft^2 at 4 in.wg.

D. Elevated Temperature Rating: 350ºF.

E. Air Flow Rating: 2000 fpm.

F. Differential Pressure Rating: 4 in.wg.

G. Smoke Detector: Integral, Factory mounted in the damper sleeve with interconnecting wiring from the damper actuator to the smoke detector enabling a single power connection point for easy field wiring.
   1. Model:
      a. DH100 rated for 100 to 4000 fpm.
      b. 2151 rated for 0 to 3000 fpm.

H. Frame: Hat-shaped channel, roll formed galvanized steel with interlocking gusseted corners. Structurally equivalent to 13-gauge U-channel type frame. Low profile head and sill on sizes less than 13 inches high.

I. Blades: 6-inch maximum width x 16 gauge, 3-V shape, roll formed galvanized steel.

J. Blade Seals: Silicone rubber permanently bonded to blade.

K. Jamb Seals: Stainless steel, flexible metal compression type.

L. Axels: Minimum ½" diameter plated steel hex-shaped, mechanically attached to blade.

M. Bearings: Self-lubricating stainless steel, sleeve-type turning in extruded hole in frame.

N. Linkage: Concealed in frame.

O. Mounting: Vertical and/or Horizontal

P. Leakage: (Class I)

Q. Mounting Sleeve: Minimum 16 inches long x 20-gauge, factory installed.

R. Actuator:
   1. Mounting:
      a. External.
      b. Internal.

S. Damper Motors: two-position action.
   1. Electrical Connection:
      a. Electric 120 V, 60 Hz, two-position, fail close.
      b. Electric 24V, 60 Hz, two-position, fail close.
      c. Electric 230 V, 50/60 Hz, two-position, fail close.

T. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors.

   1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Section 230900 "Instrumentation and Control for HVAC."
3. Permanent-Split-Capacitor or Shaded-Pole Motors: With oil-immersed and sealed gear trains.
4. Spring-Return Motors: Equip with an integral spiral-spring mechanism where indicated. Enclose entire spring mechanism in a removable housing designed for service or adjustments. Size for running torque rating of 150 in. x lbf and breakaway torque rating of 150 in. x lbf.
5. Outdoor Motors and Motors in Outdoor-Air Intakes: Equip with O-ring gaskets designed to make motors weatherproof. Equip motors with internal heaters to permit normal operation at minus 40 deg F.
6. Nonspring-Return Motors: For dampers larger than 25 sq. ft., size motor for running torque rating of 150 in. x lbf and breakaway torque rating of 300 in. x lbf.

U. Accessories:

1. Auxiliary switches for fan control.
2. Test and reset switches mounted.

2.8 COMBINATION FIRE AND SMOKE DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Pottorff.
2. Air Balance Inc.; a division of Mestek, Inc.
3. Cesco Products; a division of Mestek, Inc.
4. Greenheck Fan Corporation.
5. Nailor Industries Inc.
6. Ruskin Company.
7. Or approved equal.

B. References:
1. AMCA 500-D – Laboratory Test Methods for Testing Dampers for Ratings.
2. AMCA 511 - Certified Ratings Program for Air Control Devices.
3. IBC – International Building Code.
4. CSFM - California State Fire Marshall Listing for Fire Damper and Smoke Damper.
5. MEA – City of New York, Department of Buildings, Material and Acceptance Division.
6. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
7. NFPA 92A - Smoke-Control Systems.
8. NFPA 92B – Smoke Control Systems in Atria, Covered Malls, and Large Areas.
9. NFPA 101 – Life Safety Code.
10. UL 555 - Standard for Safety; Fire Dampers.
11. UL 555S - Standard for Safety; Leakage Rated Dampers for Use in Smoke Control Systems.

C. Rating:
   1. Fire Rating:
      a. 1½ hours in accordance with UL-555.
      b. 3 hours in accordance with UL-555.
   2. Smoke Rating:

      a. ½ Hour Fire Rated
         1) FSD-141 – Leakage Class-1 - 8 cfm/ft^2 at 4 in.wg.
         2) FSD-142 – Leakage Class-2 - 20 cfm/ft^2 at 4 in.wg.
         3) FSD-143 – Leakage Class-3 - 80 cfm/ft^2 at 4 in.wg
      b. 3 Hour Fire Rated
         1) FSD-341 – Leakage Class-1 - 8 cfm/ft^2 at 4 in.wg.
         2) FSD-342 – Leakage Class-2 - 20 cfm/ft^2 at 4 in.wg.
         3) FSD-343 – Leakage Class-3 - 80 cfm/ft^2 at 4 in.wg.
         4) Elevated Temperature Rating: 350ºF
      c. Air Flow Rating: 2000 fpm
      d. Differential Pressure Rating: 4 in.wg.

D. Type: Dynamic; rated and labeled according to UL 555 and UL 555S by an NRTL.

E. Frame: Hat-shaped channel, roll formed galvanized steel with interlocking gusseted corners. Structurally equivalent to 10-gauge U-channel type frame. Low profile head and sill on sizes less than 17 inches high.

F. Blades: 6-inch maximum width x 16 gauge, 3-V shape, roll formed galvanized steel.

G. Jamb Seals: Stainless steel, flexible metal compression type.

H. Blade Seals: Silicone rubber permanently bonded to blade.

I. Axels: Minimum ½" diameter plated steel hex-shaped, mechanically attached to blade.

J. Bearings: Self-lubricating stainless steel, sleeve-type turning in extruded hole in frame.

K. Linkage: Concealed in frame.

L. Fire Closure Device: Resettable

M. Release Temperature:
   1. 165 ºF (74 ºC).
   2. 212 ºF (100 ºC).
   3. 250 ºF (121 ºC).
   4. 286 ºF (141 ºC).
   5. 350 ºF (177 ºC).

N. Smoke Detector: Integral, factory wired for single-point connection.

O. Mounting: Vertical and/or Horizontal (1 ½ hour rated only)

P. Sleeve: Standard 16 inches long x 20 gauge (406mm x 1.0mm), factory installed.

Q. Actuator:
1. Type:
   a. Electric 120 V, 60 Hz, two-position, fail close.
   b. Electric 24V, 60 Hz, two-position, fail close.
   c. Electric 230 V, 50/60 Hz, two-position, fail close.

2. Mounting:
   a. External.
   b. Internal.

R. Damper Motors: Modulating

S. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors.

1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Section 230900 "Instrumentation and Control for HVAC."
3. Permanent-Split-Capacitor or Shaded-Pole Motors: With oil-immersed and sealed gear trains.
4. Spring-Return Motors: Equip with an integral spiral-spring mechanism where indicated. Enclose entire spring mechanism in a removable housing designed for service or adjustments. Size for running torque rating of 150 in. x lbf and breakaway torque rating of 150 in. x lbf.
5. Outdoor Motors and Motors in Outdoor-Air Intakes: Equip with O-ring gaskets designed to make motors weatherproof. Equip motors with internal heaters to permit normal operation at minus 40 deg F.
6. Nonspring-Return Motors: For dampers larger than 25 sq. ft., size motor for running torque rating of 150 in. x lbf and breakaway torque rating of 300 in. x lbf.
7. Electrical Connection: 115 V, single phase, 60 Hz.

T. Retaining Angles:
1. Model:
   a. SSPF-20, 1 ½ x ¾ inches x 20-gauge single side picture frame
   b. SSPF-16, 1 ½ x 1 ½ inches x 16-gauge single side picture frame
   c. DSPF-16, 1 ½ x 1 ½ inches x 16-gauge dual side picture frame
   d. SS-16, 1 ½ x 1 ½ inches x 16-gauge single side, individual
   e. DS-16, 1 ½ x 1 ½ inches x 16-gauge dual side, individual

U. Auxiliary switches: for fan control.
   1. RRL/OCI: Must connect directly to the blade axel for positive annunciation (interconnecting arms, wire-forms, or brackets must not be accepted) and provide full open and full closed blade indication to a remote location.

V. Duct Smoke Detector: Factory mounted in the damper sleeve with interconnecting wiring from the damper actuator to the smoke detector enabling a single power connection point for easy field wiring.
   1. Model:
      a. DH100 rated for 100 to 4,000 fpm.
      b. 2151 rated for 0 to 3,000 fpm.
      c. DH-98-P-300-4,000 FPM.
      d. D-4120-100-4,000 FPM.
      e. No flow-0-3,000 FPM

2.9 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. METALAIRE, Inc.
   4. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
   5. 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. Manufactured Turning Vanes for Nonmetal Ducts: Fabricate curved blades of resin-bonded fiberglass with acrylic polymer coating; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

D. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."

E. Vane Construction: (Single) and/or (Double) wall.

F. Vane Construction: Single wall for ducts up to (48 inches) wide and double wall for larger dimensions.

2.10 DUCT-MOUNTED ACCESS DOORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cesco Products; a division of Mestek, Inc.
2. Ductmate Industries, Inc.
3. Elgen Manufacturing.
4. Greenheck Fan Corporation.
5. McGill AirFlow LLC.
6. Nailor Industries Inc.
7. Pottorff.
8. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
9. Or approved equal.

B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 7-2, "Duct Access Doors and Panels," and 7-3, "Access Doors - Round Duct."

1. Door:

a. Double wall, rectangular.
b. 22 gauge galvanized sheet metal with 1” thick fiberglass insulation fill and thickness as indicated for duct pressure class.
c. Hinges and Latches: piano hinge and cam latches see schedule below.
d. Fabricate doors airtight and suitable for duct pressure class.

2. Frame: 22 gauge galvanized (24 gauge) sheet steel, with bend-over tabs and closed cell neoprene gaskets for door to frame and frame to duct.
3. Latches: Plated steel, cam type.
4. Hinge: Zinc plated steel continuous piano type.
5. Number of Hinges and Locks:

a. Access Doors Less Than 12 Inches Square: No hinges and two cam locks.
b. Access Doors up to 14 Inches Square: one continuous hinge and one cam latches or two cam latches.
c. Access Doors 16” by 16” Inches and larger: Continuous hinge and two cam latches or four cam latches.

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. Set dampers to fully open position before testing, adjusting, and balancing.

D. Install fire and smoke dampers according to UL listing.

E. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
   1. At outdoor-air intakes and mixed-air plenums.
   2. Downstream from manual volume dampers, control dampers, backdraft dampers, and equipment.
   3. 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.
   4. At each change in direction and at maximum 50-foot spacing.
   5. Upstream (and downstream) from turning vanes.
   6. Upstream or downstream from duct silencers.
   7. Control devices requiring inspection.

F. Install access doors with swing against duct static pressure.

G. Access Door Sizes:

   1. One-Hand or Inspection Access: 8 by 8 inches.
   2. Two-Hand Access: 12 by 12 inches.
   3. Head and Hand Access: 18 by 10 inches.
   4. Head and Shoulders Access: 21 by 14 inches.
   5. Body Access: 25 by 14 inches.
   6. Body plus Ladder Access: 25 by 17 inches.

H. Label access doors according to Section 230553 "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.

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 the purpose of access door can be performed.
3. Operate fire, smoke, and combination 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 81 26 - SPLIT-SYSTEM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 includes the providing of all labor, materials, equipment, accessories, services and tests necessary to complete and made ready for operation by the City of New York, all ductless split-DX air conditioning systems as shown on the drawings and hereinafter specified.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 “Submittal Procedures.”

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 “Quality Requirements.”

B. Manufacturing firms regularly engaged in the manufacture of this material with characteristics and capacities required, whose products have been in satisfactory use in similar service for not less than 3 years.

C. Provide equipment whose performance, under specified conditions, is certified by the manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. The system should be able to provide sufficient cooling capacity to maintain the desired temperature in the conditioned space.

B. The system should be energy efficient, with a high Energy Efficiency Ratio rating to reduce energy consumption.

C. The system should be able to accurately control the temperature within a specified range.

D. The system should operate quietly, with noise levels within acceptable limits for commercial spaces.

E. The system components should be durable and able to withstand the operating conditions over their expected lifespan.

F. The system should be easy to maintain, with accessible filters and components for cleaning and servicing.

G. The system should comply with relevant standards and regulations for HVAC systems, such as those set by ASHRAE or NYC Building Code.

2.2 DUCTLESS SPLIT DX AIR CONDITIONING SYSTEMS

A. Outdoor Air-Cooled Condensing Unit
1. General:
   a. The outdoor unit is designed specifically for use with PC series indoor units. These units are equipped with a circuit board that interfaces to the PC indoor unit and performs all functions necessary for operation. The unit must have a powder-coated finish. The outdoor unit must be completely factory-assembled, piped and wired. Each unit must be run tested at the factory.
2. Unit Cabinet:
   a. The casing must be fabricated of galvanized steel, bonderized and finished with a powder-coated baked enamel.
3. Fan:
   a. The unit must be furnished with either one or two direct drive propeller type fans.
   b. The motor must have inherent protection, and be permanently lubricated bearings.
   c. The fan motor must be mounted for quiet operation.
   d. The fan must be provided with a raised guard to prevent contact with moving parts.
   e. The outdoor unit must have a horizontal discharge airflow.
4. Coil:
   a. The condenser coil must be of nonferrous construction with lanced or corrugated plate fins on copper tubing.
   b. The coil must be protected with an integral heavy-duty metal coil guard.
   c. Refrigerant flow from the condenser must be controlled by means of a metering orifice.
5. Compressor:
   a. The compressor must be a high-performance rotary.
   b. A crankcase heater must be factory mounted on the outside of the compressor.
   c. The outdoor unit must have an accumulator.
   d. The compressor must be equipped with an internal thermal overload.
   e. The outdoor unit must have a high-pressure safety switch.
   f. The outdoor unit must have the ability to operate with a maximum height difference of 164 feet and have refrigerant tubing length of 164 feet between indoor and outdoor units without the need for line size changes, traps or additional oil (130 feet maximum for PK18).
   g. The compressor must be mounted to avoid the transmission of vibration.
   h. The outdoor unit must be capable of operating a -20-degree F ambient temperature without additional low ambient controls. Provide factory supplied wind baffle.
6. Electrical:
   a. The unit electrical power must be 208/230 volts, 1 phase, 60 hertz.

b. The unit must be capable of satisfactory operation within voltage limits of 198 volts to 253 volts.
c. The outdoor unit must be controlled by the microprocessor located in the indoor unit.
d. The control voltage between the indoor unit and the outdoor must be 12 volts, DC.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSPECTION

A. Subcontractor must examine location where this equipment is to be installed and determine space conditions and notify Commissioner in writing of conditions detrimental to proper and timely completion of the work.

B. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Install equipment where shown, in accordance with manufacturer's written instructions, and with recognized industry practices, to ensure that equipment comply with requirements and serve intended purposes.

B. Coordinate with other work as necessary to interface installation of equipment with other components of systems.

C. Check alignment and, where necessary (and possible), realign shafts of motors and equipment within tolerances recommended by manufacturer.

D. Provide 1½" condensate drain piping run to nearest available janitor's closet or sanitary drainage system. Connect to janitor's closet slop sink or with P-trap and indirect connection to sanitary drainage system. Coordinate drain connection with Plumbing Subcontractor.

3.4 CONDENSATE DISPOSAL

A. Provide drain pan overflow control as required per this section.

3.5 FIELD QUALITY CONTROL

A. Upon completion of installation of equipment, energized with normal power source, test equipment to demonstrate compliance with requirement. When possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units which cannot be satisfactorily corrected. Refer to Section 23 05 93 – Testing, Adjusting and Balancing for HVAC.

END OF SECTION 23 81 26

SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 of this Contract includes providing all labor, materials, accessories, services, and tests necessary to install complete and make ready for operation by the City of New York, all Electrical Work as shown on the Drawings and as specified hereinafter.

1.3 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.4 SUBMITTALS PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 REMOVAL AND RELOCATION OF EXISTING WORK

A. Disconnect, remove and/or relocate electrical material, equipment, devices, components, and other work noted and required by demolition or alterations in existing construction.

B. Provide new material and equipment required for relocated equipment.

C. Remove conductors from existing raceways to be rewired. Clean raceways as required prior to rewiring.

D. Tape both ends of abandoned conductors, cap outlets and abandoned raceways.

E. Cut and cap abandoned floor raceways flush with concrete floor or behind walls and ceilings.

F. Dispose of removed raceways and wiring.

G. Dispose of removed electrical equipment as directed.

H. All electrical work in adjoining areas which is indicated on the Drawings to continue to function but is affected by demolition work must be reconnected and restored to present function as part of the electrical system of the buildings.

I. Connect new work to existing work in a neat and acceptable manner, with minimum interference to existing facilities.

J. Maintain continuous operation of existing facilities affected by the work.

K. Alarm and emergency systems are to be interrupted only with the written consent of the Commissioner.

L. Temporary shutdowns when required, to be made only with the written consent of the Commissioner at times not to interfere with normal operations.

M. Where indicated on the Drawings or required by the alteration scheme, the Sub-Contractor must remove all electrical outlets, switches, and other devices, complete with associated wiring, conduit, etc., from partitions, walls, and floors that are to be removed. When the removal of these makes dead electrical wiring that is to remain, the Sub-Contractor must install junction boxes or other devices necessary to make the circuits affected continuous and ready for operation. Otherwise, wiring must be removed back to the nearest electrical outlet box that is to remain, or to the panelboard.

N. All raceways that become exposed beyond finished surfaces because of the alteration work must be removed and rerouted behind finished surfaces.

O. Wiring that is to be removed as a result of demolition work, but is required to continue to function, must be interrupted at convenient locations, rerouted (new wiring and conduits) and reconnected for continuation of their original function. New wiring extensions must match existing ones in all respects, conductor ampacity, conduit size, etc.

1.6 TEMPORARY LIGHT AND POWER

A. Electric services for temporary light and power must be obtained from the nearest existing switchboard and extended as required. Consult the Commissioner prior to making any connections to existing services.

B. The Electrical subcontractor must furnish, install and maintain the temporary lighting and power system for all trades.

C. Provide all wiring, supports, lamp sockets, receptacle sockets and any other materials, supplies or equipment necessary for the temporary light and power system.

D. Ground fault protection required by OSHA for temporary receptacle circuits must be accomplished by providing branch circuit panels containing ground fault protection branch circuit breakers.

E. Provide a grounding conductor connection to each receptacle grounding terminal. The minimum size branch circuit and grounding conductors must be No. 12 AWG.

F. Install separate stringer circuits for lighting and receptacles. Provide one lamp socket and one duplex receptacle (or two single receptacles) for every 400 square feet of new general construction area. (Approximately 20 feet on centers). Furthermore, provide one lamp

socket and one duplex receptacle every 20 feet along the peripheral walls of the construction areas for temporary conditions. Each lamp socket must be provided with a 100-watt lamp. Replace burned-out lamps as required for as long as the temporary lighting system is maintained in operation.

G. Provide sufficient supplementary temporary lighting to permit proper execution of the work. This supplementary lighting must consist of but not be limited to the following:
   1. Construction hoist landings.
   2. Stairways and stairway landings where existing illumination is inadequate due to alterations or construction.
   3. Interior rooms not covered with general construction area lighting.

H. Provide power wiring to operate the construction hoist. Provide fused disconnect switch at hoist location. Fuse size, wiring size and disconnect must be as required.

I. Keep the temporary lighting and power system operational commencing fifteen (15) minutes before the established starting time of that trade which starts work earliest in the morning and ending fifteen (15) minutes after the established quitting time of that trade which stops work latest in the evening. This applies to all weekdays, Monday through Friday inclusive, which are established as regular working days for any trade engaged in the work and must continue until Substantial completion of the work or until these services are ordered terminated by the Commissioner.

1.7 OPERATING INSTRUCTIONS (SYSTEMS AND EQUIPMENT TO BE COORDINATED WITH ELECTRICAL WORK)

A. Two months prior to the completion of all work and the final inspection of the installation by the City of New York, five copies of a complete Instruction Manual, bound in booklet form and suitably indexed, must be submitted to the Commissioner for approval. All written material contained in the Manual must be typewritten or printed.

B. The Manual must contain the following items:
   1. Table of Contents
   2. Introduction - Explanation of manual and its use.
   3. Description of system or equipment.
      a. Complete schematic drawings of all systems.
      b. Functional and sequential description of all systems.
   4. Systems Operation
      a. Operation procedures.
      b. All posted instruction charts.
   5. Maintenance
      a. Systems trouble-shooting charts.
      b. Procedures for checking out functions.
      c. Recommended list of spare parts.
   6. Listing of Manufacturers
   7. Manufacturer's Data (where multiple model, type and size listings are included, clearly and conspicuously indicate those that are pertinent to this installation.

a. Description - literature, drawings, illustrations, certified performance charts, technical data, etc.
b. Operation
c. Maintenance - including complete trouble-shooting charts
d. Parts list
e. Names, addresses and telephone numbers of recommended repair and service companies.
f. Guarantee data.

1.8 HAZARDOUS LOCATIONS

A. Provide material, equipment and installation as required for Class, Division and Group noted.

B. Provide material, equipment and installation meeting requirements of New York City Electric Code.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 26 05 00

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract

1.2 SUMMARY

A. Section Includes:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 "Submittal Procedures."

1.4 DEFINITIONS

A. VFC: Variable frequency controller.

1.5 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner's review:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

C. Product Schedule: Indicate type, use, location, and termination locations.

D. Qualification Data: For testing agency or manufacturer's authorized service representative.

E. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 "Quality Requirements."

B. Testing Agency Qualifications: Member company of NETA.
   1. An independent agency, with the experience and capability to conduct the testing indicated or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7.
   2. Testing Agency's Field Supervisor: Person currently certified by NETA to supervise on-site testing. specified in Part 3.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency, and marked for intended use.

D. Comply with NYCEC.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. All conductors and cables must be compatible with equipment being served for terminations, temperature ratings and identification requirements as required by this and other sections of these specifications.

2.2 CONDUCTORS AND CABLES

A. Description: Flexible, insulated, and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   1. Alcan Products Corporation; Alcan Cable Division.
   2. Alpha Wire.
   3. Belden Inc.
   4. Encore Wire Corporation.
   5. General Cable Technologies Corporation.
   6. Southwire Incorporated.
   7. Or approved equal

C. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.

D. Standards: Listed and labeled as defined in NYCEC, by a qualified testing agency, and marked for intended location and use.

E. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THW-2, Type THHN-2-THWN-2, and Type XHHW-2.

F. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC with ground wire.

G. VFC Cable:

1. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable.
2. Type TC-ER with oversized crosslinked polyethylene insulation, dual spirally wrapped copper tape shields and three bare symmetrically applied ground wires, and a sunlight- and oil-resistant outer PVC jacket.

2.3 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. Ideal Industries, Inc.
4. NSi Industries LLC.
5. O-Z/Gedney; a brand of the EGS Electrical Group.
6. Tyco Electronics.
7. Or approved equal

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.4 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Comply with New York City Electrical Code.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which must be extra flexible stranded.

3.3 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN-2-THWN-2, single conductors in raceway, Metal-clad cable, Type MC.

B. Exposed Branch Circuits: Type THHN-2-THWN-2, single conductors in raceway.

C. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Metal-clad cable, Type MC.

D. VFC Output Circuits: Type XHHW-2 in metal conduit.

3.4 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. 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.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.

F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.5 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 486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.

3.6 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.7 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling".

3.8 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

3.9 FIELD QUALITY CONTROL

A. Subcontractor must field test and inspect components, assemblies, and equipment installations, including connections.

B. Perform the following tests and inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test all service entrance and all feeder conductors and conductors feeding the following critical equipment and services for compliance with requirements:

   a. All conductors serving emergency and standby power system fuel-oil pumps and gas-booster pumps.
   b. All conductors serving motors 3 hp and larger.
   c. All conductors serving data center and computer room HVAC system equipment.

2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

3. Perform insulation resistance (megger) testing on all feeder and service conductors. Provide testing as per ANSI/NETA ATS-2013 (International Electrical Testing Association Standard for Acceptance Testing Specifications) part 7.3.2. Test results must be validated as per ANSI/NETA ATS-2013 Table 100.1. The applied potential must be 1000VDC for a duration of one minute. Record on NETA standard forms or other forms approved by the commissioner. Identify the specific feeder tested on each form including equipment name/reference at each end of feeder. Test equipment must measure values accurately up to a minimum of 100 meg-ohms (not a 'pass-fail' tester). Record actual meg-ohm readings below 100 meg-ohms. Submit completed test forms to commissioner for review & approval.
4. Infrared Scanning: After Substantial Completion, but not more than 60 days after Substantial completion, perform an infrared scan of each splice and all terminations in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.
    a. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
    b. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

C. Test and Inspection Reports: Prepare a written report to record the following:

1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

D. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 26 05 19

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract (City of New York Standard Construction Contract.

1.2 SUMMARY

A. Section includes grounding and bonding systems and equipment.

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. Manufacturer's technical and installation literature for all material specified or proposed in this Section for use on the project.

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, and New York City Electrical Code by a qualified testing agency and marked for intended location and application.

C. Comply with UL 467 for grounding and bonding materials and equipment.

D. Testing Agency Qualifications: Certified by NETA.

E. Provide equipment whose performance under specified conditions is certified by the manufacturer and comply with applicable publications of NFPA and UL.

F. Grounding must comply with the New York City Electrical Code (NYCEC) for construction and installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. All grounding materials must be compatible with equipment being grounded or bonded too for terminations, temperature ratings and identification requirements as required by this and other sections of these specifications.

2.2 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 and New York City Electrical Code and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.3 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by NYC Code.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
4. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches (6.3 by 100 mm) in cross section, with 9/32-inch (7.14-mm) holes spaced 1-1/8 inches (28 mm) apart. Stand-off insulators for mounting must comply with UL 891 for use in switchboards, 600 V and must be Lexan or PVC, impulse tested at 5000 V.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to Commissioner for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.

C. Compression fittings that are installed with hydraulically operated tools, approved for the class type.

D. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions. Only welded connectors for connections and splices concealed in concrete structure or buried in earth.

E. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless-type wire terminals, and long-barrel, two-bolt connection to the ground bus bar.

F. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated, or silicon bronze bolts.

G. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

H. Conduit Hubs: Mechanical type, terminal with threaded hub.

I. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial

2.5 ELECTRODES

A. Ground Rods:

1. Material: Copper-clad steel.
2. Diameter: 3/4 inch (19 mm).
3. Rods must be not less than 120 inches (3050 mm) long.

B. Ground Plates:

1. Material: Copper.
2. Thickness: 1/4 inch (min).
3. Plates must be not less than 24 inches by 24 inches.

2.6 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

C. Grounding Bus: Install in electrical and telecommunication equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus horizontally, on insulated spacers 2 inches (50 mm) minimum from wall, 6 inches (150 mm) above finished floor unless otherwise indicated.
2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.
5. Connections within Concrete Structure: Welded connectors.
6. Lightning Protection System Connections: Welded connectors.

2.7 GROUNDING AT THE SERVICE

A. Equipment grounding conductors and grounding electrode conductors must be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

B. Provide copper grounding bar in all electric service rooms and at all telecom points-of-entry (PoE). Provide copper bar for intersystem bonding bus (if required). Provide copper grounding bar as otherwise indicated on plans.

2.8 GROUNDING SEPARATELY DERIVED SYSTEMS

A. Generator: Install grounding electrode(s) at the generator location. The electrode must be connected to the frame of the generator; and, only where generator is identified as a separately derived system, to the equipment grounding conductor.

2.9 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70 and New York City Electrical Code:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.
7. Armored and metal-clad cable runs.
8. Computer and rack-mounted electronic equipment circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.

C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductors to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters,

dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

E. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

F. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, unless otherwise noted, and install in conduit.

C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

D. Exothermic welding: Exothermically weld all grounding and bonding connections and splices that will be installed to be inaccessible, including underground and within concrete slabs, columns, walls, floor slabs, etc.

E. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to all metal water service entrances to building. Connect grounding conductors to all metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve and utility meter(s).

F. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.

G. Grounding for New Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.

H. Grounding for concrete reinforcing bars in new buildings: Connect grounding electrode system to reinforcing bars via exothermic weld.

I. Connections: Make connections so the possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

J. Corrosion Protection
1. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials.
2. Use conductors with protective coatings where conditions would cause deterioration or corrosion of conductors.

3.3 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at individual ground rods. Make tests at ground rods before any conductors are connected.

    a. Measure ground resistance no fewer than two full days after last trace of precipitation and without 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.
    b. Perform tests by fall-of-potential method according to IEEE 81. Submit test report to Commissioner for approval prior to closing up any related underground work.

4. Prepare dimensioned Drawings locating each ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

B. Grounding system will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

D. Report measured ground resistances that exceed the following values:

1. Power and lighting equipment or system with capacity of 500 kVA and less: 10 ohms.
2. Power and lighting equipment or system with capacity of 500 to 1000 kVA: 5 ohms.
3. Power and lighting equipment or system with capacity more than 1000 kVA: 3 ohms.
4. Power distribution units (PDUs) or panelboards serving electronic equipment: 1 ohm(s).

E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Commissioner promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26

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. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.
3. Conduit and cable support devices.
4. Support for conductors in vertical conduit.
5. Structural steel for fabricated supports and restraints.
6. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
7. Fabricated metal equipment support assemblies

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 "Submittal Procedures."

1.4 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. RMC: Rigid metal conduit.

1.5 PERFORMANCE REQUIREMENTS

A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor as recommended by Commissioner.

1.6 SUBMITTALS

A. Product Data: For each type of product, include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

1. Steel slotted support systems, hardware and accessories.
2. Nonmetallic slotted support systems, hardware and accessories.
3. Clamps.
4. Hangers.
5. Sockets.
6. Eye nuts.
7. Fasteners.
8. Anchors.
9. Saddles.
10. Brackets.

B. Include rated capacities and furnished specialties and accessories.

C. Shop Drawings: Signed and sealed by a qualified professional engineer licensed in the State of New York. Show fabrication and installation details and include calculations for the following:

1. Trapeze hangers. Include Product Data for components.
2. Slotted support systems. Include Product Data for components.
3. Equipment supports.
4. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
5. Include design calculations for seismic restraints

D. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner's review:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.
3. Conduit and cable support devices.
4. Support for conductors in vertical conduit.
5. Structural steel for fabricated supports and restraints.
6. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.

7. Fabricated metal equipment support assemblies

E. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Suspended ceiling components.
2. Ductwork, piping, fittings, and support.
3. Structural members to which hangers and supports will be attached.
4. Size and location of initial access modules for acoustical tile.
5. Items penetrating finished ceiling, including the following:

a. Luminaires.
b. Air outlets and inlets.
c. Speakers.
d. Sprinklers.
e. Access panels.
f. Projectors.

F. Welding Certificates.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 "Quality Requirements."

B. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Comply with NFPA 70.

D. Comply with New York City Electrical Code.

1.8 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified together with concrete Specifications.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Engage a qualified professional engineer licensed in the State of New York, as defined in "Quality Requirements," to design hanger and support system.

1. Engineer supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
2. Engineer equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
3. 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.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings from an applicable testing agency.
1. Flame Rating: Class 1.
2. Self-extinguishing according to ASTM D 635.

2.2 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. Thomas & Betts Corporation.
d. Unistrut; Tyco International, Ltd.
e. Or approved equal

2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
5. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel and malleable-iron 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.

E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      1) Hilti Inc.
      2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      3) MKT Fastening, LLC.
      4) Simpson Strong-Tie Co., Inc.; MasterSet Fastening Systems Unit.
      5) Or approved equal

2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened Portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.

   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      1) Cooper B-Line, Inc.; a division of Cooper Industries.
      2) Hilti Inc.
      3) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      4) MKT Fastening, LLC.
      5) Or approved equal

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for the attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

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 NFPA 70. Minimum rod size must be 1/4 inch (6 mm) in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps.

3.3 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. 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 (90 kg).

C. 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:

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. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
6. To Light Steel: Sheet metal screws.
7. 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 by means that meet seismic-restraint strength and anchorage requirements.

D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.4 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

B. Field Welding: Comply with AWS D1.1/D1.1M.

3.5 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi (20.7-MPa) 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 033000 "Cast-in-Place Concrete."

C. Anchor equipment to concrete base.

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

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 with a brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

B. Touchup: Comply with requirements as described in architectural sections 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-repair paint to comply with ASTM A 780.

END OF SECTION 26 05 29

SECTION 26 05 33 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract

1.2 SUMMARY

A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Metal wireways and auxiliary gutters.
4. Surface raceways.
5. Boxes, enclosures, and cabinets.

B. The requirements of this section apply to raceway work required for the protection of electrical conductors. Raceways are required for all wiring unless otherwise specified.

C. The work includes the furnishing and installation of completely coordinated, effectively grounded raceway systems complete with boxes, fittings, flexible connections to vibrating equipment and other accessories, as required. Conduit or tubing sizes referred to in the Specifications and on the Drawings are nominal trade sizes.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 "Submittal Procedures."

1.4 DEFINITIONS

A. ARC: Aluminum rigid conduit.

B. GRC: Galvanized rigid steel, threaded conduit.

C. IMC: Intermediate metal conduit.

D. EMT: Electrical metallic tubing.

E. EPDM: Ethylene-propylene-diene terpolymer rubber.

F. FMC: Flexible metal conduit.

G. LFMC: Liquid tight flexible metal conduit

1.5 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner's review:

1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Metal wireways and auxiliary gutters.
4. Surface raceways.
5. Boxes, enclosures, and cabinets.

C. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Structural members in the paths of conduit groups with common supports.
2. HVAC and plumbing items and architectural features in the paths of conduit groups with common supports.

D. Source quality-control test reports.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 "Quality Requirements."

B. Comply with New York City Electrical Code (NYCEC).

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in, NYCEC Article 100 by a testing agency acceptable to NYCEC and marked for intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. All raceways must be suitable for the environment in which they are being installed and with additional requirements as listed in these specifications.

2.2 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Allied Tube & Conduit.
2. O-Z/Gedney.
3. Thomas & Betts Corporation.
4. Western Tube and Conduit Corporation.
5. Wheatland Tube Company.
6. Or approved equal

B. Listing and Labeling: Metal conduits, tubing, and fittings must be listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.

C. Rigid Steel Conduit: ANSI C80.1.

D. Aluminum Rigid Conduit: ANSI C80.5.

E. GRC: Comply with ANSI C80.1 and UL 6.

F. IMC: Comply with ANSI C80.6 and UL 1242.

G. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit and IMC.

1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040 inch (1 mm), minimum.

H. EMT: Comply with ANSI C80.3 and UL 797.

I. FMC: Comply with UL 1; zinc-coated steel.

J. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

K. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.

1. Fittings for EMT:

a. Material: Steel.
b. Type: Setscrew.

2. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions were installed, and including flexible external bonding jumper.
3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.

L. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70 and New York City Electrical Code, for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.3 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.
3. Condux International, Inc.
4. Lamson & Sessions; Carlon Electrical Products.
5. RACO; Hubbell.
6. Thomas & Betts Corporation.
7. Or approved equal

B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings must be listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.

C. ENT: Comply with NEMA TC 13 and UL 1653.

D. LFNC: Comply with UL 1660.

E. RTRC: Comply with UL 1684A and NEMA TC 14.

F. Fittings for ENT: Comply with NEMA TC 3; match to conduit or tubing type and material.

G. Fittings for LFNC: Comply with UL 514B.

2.4 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper B-Line, Inc.
2. Hoffman.
3. Mono-Systems, Inc.
4. Square D.
5. Or approved equal

B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 and Type 3R, unless otherwise indicated, and sized according to NFPA 70 and New York City Electrical Code.

1. Metal wireways installed outdoors must be listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.

C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Wireway Covers: Flanged-and-gasketed type unless otherwise indicated.

E. Finish: Manufacturer's standard enamel finish.

2.5 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Technologies Company; Cooper Crouse-Hinds.
2. Hoffman.
3. Milbank Manufacturing Co.
4. O-Z/Gedney.
5. Thomas & Betts Corporation.
6. Wiremold / Legrand.
7. Or approved equal

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations must be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

E. Metal Floor Boxes:

1. Material: Cast metal.
2. Type: Fully adjustable.
3. Shape: Rectangular or as required by field conditions, subject to Commissioner’s approval.
4. Listing and Labeling: Metal floor boxes must be listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.

F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1

G. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb (23 kg). Outlet boxes designed for attachment of luminaires weighing more than 50 lb (23 kg) must be listed and marked for the maximum allowable weight.

H. Box extensions used to accommodate building finishes must be of same material as recessed box.

I. Device Box Dimensions: 4 inches square by 2-1/8 inches deep (100 mm square by 60 mm deep) for quad and telecommunication installations, and 4 inches by 2-1/8 inches by 2-1/8 inches deep (100 mm by 60 mm by 60 mm deep) for single device installations

J. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb (32 kg).

1. Listing and Labeling: Paddle fan outlet boxes must be listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.

K. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

L. Box extensions used to accommodate new building finishes must be of same material as recessed box.

M. Device Box Dimensions: As required by field conditions, subject to Commissioner ’s approval.

N. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch for general use, or NEMA 250, Type 12, for dusty environments.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Plastic, finished inside with radio-frequency-resistant paint.

O. Gangable boxes are allowed.

P. Cabinets:

1. NEMA 250, Type 1 and Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet were required for freestanding equipment.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC; except where IMC or GRC, PVC coated is specified in the Contract Drawings.
2. Concealed Conduit, Aboveground: IMC.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:

    a. Loading dock.
    b. Mechanical rooms.

4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: GRC.

C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
3. EMT: Use setscrew cast-metal fittings except below design flood elevation (DFE). Comply with NEMA FB 2.10.
4. EMT below design flood elevation (DFE): Rainproof compression connectors. Comply with NEMA FB 2.10.
5. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

F. Install surface raceways only where indicated on Drawings.

G. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F (49 deg C).

3.3 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 and New York City Electrical Code limitations for types of raceways allowed in specific occupancies and number of floors.

B. Comply with New York City Electrical Code.

C. Do not install raceways or electrical items on any rotating equipment.

D. Do not fasten conduits onto the bottom side of a metal deck roof.

E. 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.

F. Complete raceway installation before starting conductor installation.

G. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

H. Arrange stub-ups so curved portions of bends are not visible above finished slab.

I. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction. Coordinate specific requirements for conduit routing with telecommunication system installer.

J. Make bends in raceway using large-radius preformed ells. Field bending must be according to NYCEC minimum radii requirements. Use only equipment specifically designed for material and size involved.

K. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

L. Support conduit within 12 inches (300 mm) of enclosures to which attached.

M. Raceways Embedded in Slabs:

1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot (3-m) intervals.
2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
3. Arrange raceways to keep a minimum of 2 inches (50 mm) of concrete cover in all directions.

4. Do not embed threadless fittings in concrete unless specifically approved by the Commissioner for each specific location.
5. Change from ENT to GRC or IMC before rising above floor.

N. Stub-ups to Above Recessed Ceilings:

1. Use EMT, IMC, or flex raceways.
2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

O. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

P. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

Q. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

R. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

S. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

T. Cut conduit perpendicular to the length. For conduits 2-inch (53-mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

U. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

V. Raceways for Communications Cable: Install raceways, as follows:

1. 3/4-Inch (19-mm) Trade Size and Smaller: Install raceways in maximum lengths of 50 feet (15 m).
2. 1-Inch (25-mm) Trade Size and Larger: Install raceways in maximum lengths of 75 feet (23 m).
3. Install a maximum of two 90-degree bends or equivalent for each length of raceway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

W. Expansion-Joint Fittings:

1. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F (55 deg C) and that has straight-run length that exceeds 100 feet (30 m).
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:

    a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C)
    b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.
    c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
    d. Attics: 135 deg F (75 deg C) temperature change.

3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change.
4. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.
5. Install expansion fittings at all locations where conduits cross building or structure expansion joints.

X. Surface Raceways:

1. Install surface raceway with a minimum 2-inch (50-mm) radius control at bend points.
2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches (1200 mm) and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

Y. Install raceway sealing fittings at accessible locations according to NFPA 70 and New York City Electrical Code and fill them with 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 according to NFPA 70 and New York City Electrical Code.

Z. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.
3. Where otherwise required by NFPA 70 and New York City Electrical Code.

AA. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

BB. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches (1830 mm) of flexible conduit for recessed and semi-recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC in damp or wet locations not subject to severe physical damage.

CC. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

DD. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

EE. Horizontally separate boxes mounted on opposite sides of walls, so they are not in the same vertical channel.

FF. Locate boxes so that cover or plate will not span different building finishes.

GG. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

HH. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

II. Set metal floor boxes level and flush with finished floor surface.

JJ. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.4 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.5 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.6 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 26 05 33

SECTION 26 05 44 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:

1. Sleeve-seal systems.
2. Sleeve-seal fittings.
3. Grout.
4. Silicone sealants.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

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.

B. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner's review:

1. Sleeve-seal systems.
2. Sleeve-seal fittings.
3. Grout.
4. Silicone sealants.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 "Quality Requirements."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. The sleeves and seals should be compatible with the materials used in the pipes and structures they are sealing, such as concrete, PVC, or metal.

2.2 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.

2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral water stop unless otherwise indicated.

B. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

C. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

D. Sleeves for Rectangular Openings:

1. Material: Galvanized sheet steel.
2. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness must be 0.052 inch (1.3 mm).
b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness must be 0.138 inch (3.5 mm).

2.3 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Advance Products & Systems, Inc.
    b. CALPICO, Inc.
    c. Metraflex Company (The).
    d. Pipeline Seal and Insulator, Inc.
    e. Or approved equal

2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel.
4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating of length required to secure pressure plates to sealing elements.

2.4 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, water-stop assembly made for embedding in concrete slab or wall. Unit must have plastic or rubber water-stop collar with the center opening to match piping OD.
    1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
        a. HOLDRITE.
        b. Presealed Systems.
        c. Advance Products & Systems, Inc.
        d. CALPICO, Inc.
        e. Or approved equal

2.5 GROUT

A. Description: Non-shrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.6 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire-rated.

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall, so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular-sleeved opening.
3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during the erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above the finished floor level. Install sleeves during the erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular-sleeved opening.

2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe 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.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.3 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position the water-stop flange to be centered on a concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around the outside of sleeve-seal fittings.

END OF SECTION 26 05 44

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels.
8. Miscellaneous identification products.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 "Submittal Procedures."

1.4 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products

B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.

C. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels. Refer to the drawings for equipment identifications for electrical equipment.

D. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner's review:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels.
8. Miscellaneous identification products.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 "Quality Requirements."

B. Comply with ANSI A13.1.

C. Comply with NFPA 70.

D. Comply with New York City Electrical Code.

E. Comply with New York City Building Code.

F. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

G. Comply with ANSI Z535.4 for safety signs and labels.

H. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, must comply with UL 969.

I. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.6 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by NYCEC, NFPA standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. The identification materials must be compatible with equipment and materials being identified and must comply with specific articles of this section.

2.2 LABELS

A. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.

B. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

C. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking cable tie fastener.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.3 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

A. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches (50 mm) wide; compounded for outdoor use.

2.4 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.

B. Self-Adhesive, Self-Laminating Polyester Labels: Preprinted, 3-mil- (0.08-mm-) thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the cable diameter such that the clear shield overlaps the entire printed legend.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

C. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of cable it identifies and to stay in place by gripping action.

2.5 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.

B. Self-Adhesive, Self-Laminating Polyester Labels: Preprinted, 3-mil- (0.08-mm-) thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the conductor diameter such that the clear shield overlaps the entire printed legend.

C. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve with diameter sized to suit diameter of conductor it identifies and to stay in place by gripping action.

D. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.6 FLOOR MARKING TAPE

A. 2-inch- (50-mm-) wide, 5-mil (0.125-mm) pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

2.7 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Metal-Backed, Butyrate Warning Signs:

1. 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 application.
2. 1/4-inch (6.4-mm) grommets in corners for mounting.
3. Nominal size, 10 by 14 inches (250 by 360 mm).

C. Warning label and sign must include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "Danger – Electrical Shock Hazard – Equipment Has Multiple Power Sources."
2. Workspace Clearance Warning: "Warning - OSHA Regulation – Area in Front of Electrical Equipment Must be Kept Clear for 36 Inches (915 mm)."

3. Electrical room: “Warning, Electrical Equipment, No Storage Permitted”.

2.8 INSTRUCTION SIGNS

A. Engraved laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. inches (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.

1. Engraved legend with white letters on black face.
2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height must be 3/8 inch (10 mm).

C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. The minimum letter height must be 3/8 inch (10 mm). Overlay must provide a weatherproof and UV-resistant seal for label.

2.9 EQUIPMENT IDENTIFICATION LABELS

A. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. The minimum letter height must be 3/8 inch (10 mm).

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. The minimum letter height must be 3/8 inch (10 mm). Overlay must provide a weatherproof and UV-resistant seal for label.

C. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. The minimum letter height must be 3/8 inch (10 mm).

D. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. The minimum letter height must be 3/8 inch (10 mm).

E. Stenciled Legend: In nonfading, waterproof, paint. Minimum letter height must be 1 inch (25 mm).

2.10 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).

4. Color: Black except where used for color-coding.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black.

C. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, self-locking.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 7000 psi (48.2 MPa).
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg F (Minus 46 to plus 140 deg C).
5. Color: Black.

2.11 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Verify the identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

E. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.

F. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

G. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.3 IDENTIFICATION SCHEDULE

A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl tape applied in bands. Install labels at 30-foot (10-m) maximum intervals.

B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends must be as follows:

1. Emergency Power.
2. Power.

C. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.

D. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

E. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.

1. Limit use of underground-line warning tape to direct-buried cables.
2. Install underground-line warning tape for both direct-buried cables and cables in raceway.

F. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace must be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install flush-mounted panelboards and similar equipment in finished spaces.

G. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Metal-backed, butyrate warning signs.

1. Comply with 29 CFR 1910.145.
2. Identify system voltage with black letters on an orange background.
3. Apply to exterior of door, cover, or other access.
4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:

a. Power transfer switches.
b. Controls with external control power connections.

H. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

I. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- (10-mm-) high letters for emergency instructions at equipment used for power transfer.

J. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.
b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:

a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification must be engraved, laminated acrylic or melamine label.
b. Enclosures and electrical cabinets.
c. Switchgear.
d. Switchboards.
e. Emergency system boxes and enclosures.
f. Enclosed switches.
g. Enclosed circuit breakers.
h. Enclosed controllers.
i. Variable-speed controllers.
j. Power transfer equipment.
k. Remote-controlled switches, dimmer modules, and control devices.
l. Power-generating units.
m. Monitoring and control equipment.

END OF SECTION 26 05 53

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:

1. Receptacles, receptacles with integral GFCI, and associated device plates.
2. Tamper-resistant receptacles.
3. Weather-resistant receptacles.
4. Snap switches and wall-box dimmers.
5. Solid-state fan speed controls.
6. Wall-switch and exterior occupancy sensors.
7. Communications outlets.

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.

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

C. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner's review:

1. Receptacles, receptacles with integral GFCI, and associated device plates.
2. Tamper-resistant receptacles.
3. Weather-resistant receptacles.
4. Snap switches and wall-box dimmers.
5. Solid-state fan speed controls.
6. Wall-switch and exterior occupancy sensors.
7. Communications outlets.

D. Approvals: All submittals must be approved by the Commissioner. The Commissioner must approve wiring devices and wall plates for style and finish.

E. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.5 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

D. RFI: Radio-frequency interference.

E. UTP: Unshielded twisted pair.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 "Quality Requirements."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Comply with the current New York City Electrical Code.

D. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors must comply with UL 2459 and must be made with stranding building wire.
2. Devices must comply with the requirements in this Section.

E. Devices for City of New York-Furnished Equipment:

1. Receptacles: Match plug configurations.
2. Cord and Plug Sets: Match equipment requirements.

F. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by Commissioner unless otherwise indicated or required by NFPA 70 NYCEC or device listing.
2. Wiring Devices Connected to Essential Electrical System: Red.

G. Wall Plate Color: For plastic covers, match device color.

H. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Wiring Devices; Division of Cooper Industries, Inc. (Cooper).
2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
3. Leviton Mfg. Company Inc. (Leviton).
4. Pass & Seymour/Legrand (Pass & Seymour).
5. Or approved equal

B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

C. Provide wiring devices as specified in this section unless otherwise noted by the Commissioner. Listed manufacturers are subject to approval by the Commissioner.

2.3 STRAIGHT-BLADE RECEPTACLES

A. Convenience Receptacles, two-pole, three-wire, grounding, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; 5351 (single), CR5362 (duplex).
b. Hubbell; HBL5351 (single), HBL5352 (duplex).
c. Leviton; 5891 (single), 5352 (duplex).
d. Pass & Seymour; 5361 (single), 5362 (duplex).
e. Or approved equal

B. Tamper-Resistant Convenience Receptacles, two-pole, three-wire, grounding, 125 V, 15 A and 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498 Supplement sd, and FS W-C-596.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; TR8300.
b. Hubbell; HBL8300SGA.

c. Leviton; 8300-SGG.
d. Pass & Seymour; TR63H; 885TR.
e. Or approved equal

C. Weather-Resistant Duplex Receptacle, 125 V, 20 A:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Cooper
b. Hubbell Incorporated
c. Leviton Manufacturing Co.
d. Pass & Seymour
e. Or approved equal
2. Description: Two pole, three wire, grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498.
5. Marking: Listed and labeled as complying with NFPA 70 National Electrical Code (NEC) and New York City Electrical Code (NYCEC), "Receptacles in Damp or Wet Locations" Article.

2.4 GFCI RECEPTACLES

A. General Description:

1. Straight blade, feed-through type.
2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
3. Include integral GFCI with "Test" and "Reset" buttons and indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

B. Duplex GFCI Convenience Receptacles, two-pole, three-wire, grounding, 125 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; VGF20.
b. Hubbell; GFR5352L.
c. Pass & Seymour; 2095.
d. Leviton; 7590.
e. Or approved equal

C. Tamper-Resistant GFCI Convenience Receptacles, two-pole, three-wire, grounding, 125 V, 15 A and 20 A:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Hubbell; GFTR20.
b. Pass & Seymour; 2095TR.
c. Leviton GFTR2

d. or approved equal

2.5 TWIST-LOCKING RECEPTACLES

A. Twist-Lock, Single Receptacles, two-pole, three-wire, grounding, 120 V, 20 A:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Cooper
b. Hubbell Incorporated
c. Leviton Manufacturing Co.
d. Pass & Seymour
e. Or approved equal
2. Configuration: NEMA WD 6, Configuration L5-20R.
3. Standards: Comply with UL 498.

2.6 TOGGLE SWITCHES

A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

B. Switches, 120/277 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Single Pole:
1) Cooper; AH1221.
2) Hubbell; HBL1221.
3) Leviton; 1221-2.
4) Pass & Seymour; CSB20AC1.
5) Or approved equal

b. Two Pole:
1) Cooper; AH1222.
2) Hubbell; HBL1222.
3) Leviton; 1222-2.
4) Pass & Seymour; CSB20AC2.
5) Or approved equal

c. Three Way:
1) Cooper; AH1223.
2) Hubbell; HBL1223.
3) Leviton; 1223-2.
4) Pass & Seymour; CSB20AC3.
5) Or approved equal

d. Four Way:
1) Cooper; AH1224.

2) Hubbell; HBL1224.
3) Leviton; 1224-2.
4) Pass & Seymour; CSB20AC4.
5) Or approved equal

C. Pilot-Light Switches, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; AH1221PL for 120 and 277 V.
b. Hubbell; HBL1201PL for 120 and 277 V.
c. Leviton; 1221-LH1.
d. Pass & Seymour; PS20AC1RPL for 120 V, PS20AC1RPL7 for 277 V.
e. Or approved equal

2. Description: Single pole, with neon-lighted handle, illuminated when switch is "off."

D. Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches: 120/277 V, 20 A; for use with mechanically held lighting contactors.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; 1995.
b. Hubbell; HBL1557.
c. Leviton; 1257.
d. Pass & Seymour; 1251.
e. Or approved equal

2.7 DECORATOR-STYLE DEVICES

A. Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; 6252.
b. Hubbell; DR15.
c. Leviton; 16252.
d. Pass & Seymour; 26252.
e. Or approved equal

B. Tamper-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; TR6252.
b. Hubbell; DR15TR.

c. Pass & Seymour; TR26252.
d. Or approved equal

2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section.

C. Tamper-Resistant and Weather-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; TWRBR15.
b. Hubbell; DR15TR.
c. LevitonTRW15.
d. Pass & Seymour; TRW26252.
e. Or approved equal

2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section, when installed in wet and damp locations.

D. GFCI, Feed-Through Type, Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, UL 498, and UL 943 Class A.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; VGF15.
b. Hubbell; GF15LA.
c. Leviton; 8599.
d. Pass & Seymour; 1594.
e. Or approved equal

E. GFCI, Tamper-Resistant and Weather-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, UL 498, and UL 943 Class A.

1. Products: Subject to compliance with requirements, provide one of the following :

a. Cooper; TWRVGF15.
b. Hubbell; GFTR15.
c. Pass & Seymour; 1594TRWR.
d. Or approved equal

2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section.

F. Toggle Switches, Square Face, 120/277 V, 15 A: Comply with NEMA WD 1, UL 20, and FS W-S-896.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; 7621 (single pole), 7623 (three way).
b. Hubbell; DS115 (single pole), DS315 (three way).
c. Leviton; 5621-2 (single pole), 5623-2 (three way).
d. Pass & Seymour; 2621 (single pole), 2623 (three way).
e. Or approved equal

G. Lighted Toggle Switches, Square Face, 120 V, 15 A: Comply with NEMA WD 1 and UL 20.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; 7631 (single pole), 7633 (three way).
b. Hubbell; DS120IL (single pole), DS320 (three way).
c. Leviton; 5631-2 (single pole), 5633-2 (three way).
d. Pass & Seymour; 2625 (single pole), 2626 (three way).
e. Or approved equal

2. Description: With neon-lighted handle, illuminated when switch is "off."

2.8 WALL PLATES

A. Single and combination types must match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
3. Material for Unfinished Spaces: Galvanized steel.
4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.9 MULTIOUTLET ASSEMBLIES

A. Basis of design Product: Provide Wiring Device-Kellems by Hubbell Incorporated or comparable product by one of the following:
1. Wiremold/ Legrand.
2. B-line
3. Leviton
4. Or approved equal

B. Description:

1. Two-piece surface metal raceway, with factory-wired multioutlet harness.
2. Components must be products from a single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.

C. Raceway Material: Metal, with manufacturer's standard finish.

2.10 FINISHES

A. Color: Wiring device catalog numbers in Section Text do not designate device color.

1. Wiring Devices Connected to Normal Power System: As selected by Commissioner unless otherwise indicated or required by NFPA 70 or device listing.
2. Wiring Devices Connected to Emergency Power System: Red.

B. Wall Plate Color: For plastic covers, match the device color.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Take steps to ensure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.

3. The length of free conductors at outlets for devices must meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:

    a. Cut back and pigtail or replace all damaged conductors.
    b. Straighten conductors that remain and remove corrosion and foreign matter.
    c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around the terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections. No. 10 AWG may be directly wired to devices listed for 10 AWG using side-wire clamping terminals.
8. Tighten all unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles down and on horizontally mounted receptacles to the right, unless otherwise indicated.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan speed control are listed for that application.
3. Install unshared neutral conductors online and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on bottom. Group adjacent switches under single, multi-gang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.3 GFCI RECEPTACLES

A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.4 IDENTIFICATION

A. Comply with Section 260553 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Test Instruments: Use instruments that comply with UL 1436.
2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

B. Tests for Convenience Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. Tests must be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace them with new ones, and retest as specified above.

C. Wiring devices will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports, upon request.

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. Section Includes:

1. Cartridge fuses rated 600-V ac and less for use in, control circuits, pullout, enclosed switches, panelboards, switchboards, etc.
2. Spare-fuse cabinets.

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. Include construction details, material, dimensions, descriptions of individual components, and finishes for spare-fuse cabinets. Include the following for each fuse type indicated:

1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
2. Current-limitation curves for fuses with current-limiting characteristics.
3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse.
4. Coordination charts and tables and related data.
5. Fuse sizes for elevator feeders and elevator disconnect switches.

B. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner's review:

1. Cartridge fuses rated 600-V ac and less for use in, control circuits, pullout, enclosed switches, panelboards, switchboards, etc.
2. Spare-fuse cabinets.

C. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals. In addition to items specified in "Closeout Procedures," and "Operation and Maintenance Data," include the following:

1. Ambient temperature adjustment information.
2. Current-limitation curves for fuses with current-limiting characteristics.
3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse used on the Project. Submit in electronic format suitable for use in coordination software.
4. Coordination charts and tables and related data

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 "Quality Requirements."

B. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

C. 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.

D. Comply with NEMA FU 1 for cartridge fuses.

E. Comply with NFPA 70.

F. Comply with UL 248-11 for plug fuses.

1.6 PROJECT CONDITIONS

A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F (5 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 utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fuses, Components, and Accessories must be Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Comply with the current New York City Electrical Code.

D. Source Limitations: Obtain each type of fuse from a single source from a single manufacturer.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Bussmann, Inc.
2. Edison Fuse, Inc.
3. Mersen, USA (Ferraz Shawmut, Inc.)
4. Littelfuse, Inc.
5. Or approved equal

B. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

2.3 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

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 NEMA FU 1 for cartridge fuses.

D. Comply with NFPA 70.

E. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

2.4 PLUG FUSES

A. Characteristics: UL 248-11, nonrenewable plug fuses; 125-V ac.

2.5 PLUG-FUSE ADAPTERS

A. Characteristics: Adapters for using Type S, rejection-base plug fuses in Edison-base fuse holders or sockets; ampere ratings matching fuse ratings; irremovable once installed.

2.6 SPARE-FUSE CABINET

A. Characteristics: Wall-mounted 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- (38-mm-) high letters on exterior of door.
4. Fuse Pullers: For each size of fuse, where applicable and available, from fuse manufacturer.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.

B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.

C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 FUSE APPLICATIONS

A. Cartridge Fuses:

1. Service Entrance: Class L, fast acting Class L, time delay, Class RK1, fast acting Class RK1, time delay Class J, fast acting Class J, time delay.
2. Feeders: Class L, fast acting Class L, time delay Class RK1, fast acting Class RK1, time delay Class RK5, fast acting Class RK5, time delay Class J, fast acting Class J, time delay.
3. Motor Branch Circuits: Class RK1 Class RK5, time delay.

4. Other Branch Circuits: Class RK1, time delay Class RK5, time delay Class J, fast acting Class J, time delay.
5. Control Circuits: Class CC, time delay.
6. Or as indicated on drawings.

3.4 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable from the front of the equipment, or with partially opened cabinet door, without removing fuse.

3.5 IDENTIFICATION

A. Install labels complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems" and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 26 28 13

SECTION 26 28 16 - ENCLOSED SWITCHES AND 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. Fusible switches.
2. Nonfusible switches.
3. Shunt trip switches.
4. Molded-case circuit breakers (MCCBs).
5. Enclosures.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions, Section 013300 "Submittal Procedures."

1.4 SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
3. Short-circuit current ratings (interrupting and withstand, as appropriate).
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. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergencies, operation, and maintenance manuals.
1. Include the following:
a. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.

b. 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. Provide in PDF electronic format.

C. Shop Drawings: Submit product data and cutsheets for the following components for the Commissioner's review:
1. Fusible switches.
2. Nonfusible switches.
3. Shunt trip switches.
4. Molded-case circuit breakers (MCCBs).
5. Enclosures.

1.5 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

D. AFF: Above Finished Floor.

1.6 PERFORMANCE REQUIREMENTS

A. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event".

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions, Section 014000 "Quality Requirements."

B. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.

C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

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. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

F. Comply with NFPA 70.

G. Comply with New York City Electrical Code.

1.8 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).
2. Altitude: Not exceeding 6600 feet (2010 m).

B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by City of New York or others 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 7 business 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 written permission.
4. Comply with NFPA 70E.

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year from date of Substantial Completion

1.10 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Enclosed switches and circuit breakers must be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Comply with the current New York City Electrical Code.

2.2 GENERAL REQUIREMENTS

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

D. Comply with New York City Electrical Code (NYCEC).

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in, NYCEC Article 100 by a testing agency acceptable to NYC Code and marked for intended use.

2.3 FUSIBLE SWITCHES

A. Manufacturer: Subject to compliance with requirements, provide product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.
5. Or approved equal

B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Isolated Ground Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
5. Hookstick Handle: Allows use of a hookstick to operate the handle where mounted above 6’ AFF.
6. Lugs: Mechanical type, suitable for number, size, and conductor material.

7. Service-Rated Switches: Labeled for use as service equipment.
8. Accessory Control Power Voltage: Remote mounted and powered; 120-V ac/208-V ac.

2.4 NONFUSIBLE SWITCHES

A. Manufacturer: Subject to compliance with requirements, provide product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.
5. Or approved equal

B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Hookstick Handle: Allows use of a hookstick to operate the handle where mounted above 6’ AFF.
4. Lugs: Mechanical type, suitable for number, size, and conductor material.
5. Accessory Control Power Voltage: Remote mounted and powered; 120-V ac/208-V ac.

2.5 SHUNT TRIP SWITCHES

A. Manufacturer: Subject to compliance with requirements, provide product by one of the following:

1. Cooper Bussmann, Inc.
2. Ferraz Shawmut, Inc.
3. Littelfuse, Inc.
4. Square D.
5. Or approved equal

B. General Requirements: Comply with ASME A17.1, UL 50, and UL 98, with 200-kA interrupting and short-circuit current rating when fitted with Class J fuses.

C. Switches: Three-pole, horsepower rated, with integral shunt trip mechanism and Class J fuse block; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.

D. Control Circuit: 120-V ac; obtained from integral control power transformer, with primary and secondary fuses, with a control power source of enough capacity to operate shunt trip, connected pilot, and indicating and control devices.

E. Accessories:

1. Oiltight key switch for key-to-test function.
2. Oiltight green ON pilot light.
3. Isolated neutral lug; 200 percent rating.
4. Mechanically interlocked auxiliary contacts that change state when switch is opened and closed.
5. Form C alarm contacts that change state when switch is tripped.

2.6 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturer: Subject to compliance with requirements, provide product by one of the following::

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.
5. Or approved equal

B. 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. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

D. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.

E. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:

1. Instantaneous trip.
2. Long- and short-time time adjustments.
3. Ground-fault pickup level, time delay, and I^2t response.

F. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.

G. Ground-Fault, Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).

H. 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.
4. Ground-Fault Protection: Comply with UL 1053; integrally mounted type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
5. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
6. Zone-Selective Interlocking: Integral with ground-fault trip unit; for interlocking ground-fault protection function.
7. Electrical Operator: Provide remote control for on, off, and reset operations.

2.7 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturer: Subject to compliance with requirements, provide product by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.
5. Or approved equal

B. General Requirements: MCCB with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.

C. Circuit breakers must be constructed using glass-reinforced insulating material. Current carrying components must be completely isolated from the handle and the accessory mounting area.

D. Circuit breakers must have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle must be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon must be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.

E. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings must be clearly marked on face of circuit breaker. Circuit breakers must be 100 percent rated.

F. MCCBs must be equipped with a device for locking in the isolated position.

G. Lugs must be suitable for 167 deg F (75 deg C) rated wire per NYCEC.

H. Standard: Comply with UL 489 with interrupting capacity to comply with available fault currents.

I. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

J. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.

K. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:

1. Instantaneous trip.
2. Long- and short-time pickup levels.
3. Long- and short-time time adjustments.
4. Ground-fault pickup level, time delay, and I-squared t response.

L. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.

M. Ground-Fault Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip)

N. Features and Accessories:

1. Standard frame sizes and number of poles.
2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
3. Ground-Fault Protection: Comply with UL 1053; remote-mounted and powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
4. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.

2.8 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
2. Outdoor Locations: NEMA 250, Type 3R, unless otherwise indicated.
3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.

B. Enclosure Finish: The enclosure must be finished with gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1).

C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures must contain no knockouts. NEMA 250 Types 7 and 9 enclosures must be provided with threaded conduit openings in both end walls.

D. Operating Mechanism: The circuit-breaker operating handle must be externally operable with the operating mechanism being an integral part of the box, not the cover. The cover interlock mechanism must have an externally operated override. The override must not permanently disable the interlock mechanism, which must return to the locked position once the override is released. The tool used to override the cover interlock mechanism must not be required to enter the enclosure in order to override the interlock.

E. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K must have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.

F. NEMA 250 Type 7/9 enclosures must be furnished with a breather and drain kit to allow their use in outdoor and wet location applications.

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 enclosed switches and 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 PREPARATION

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Commissioner or others 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 fourteen (14) 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 Commissioners' written permission.
4. Comply with NFPA 70E.

3.4 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
2. Outdoor Locations: NEMA 250, Type 3R, Type 4X.
3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
4. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

3.5 INSTALLATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels

B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

C. Comply with mounting and anchoring requirements specified in Section 260529 – “Hangers And Supports For Electrical Systems”.

D. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

E. Install fuses in fusible devices.

F. Comply with NECA 1.

3.6 IDENTIFICATION

A. Comply with requirements 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 metal or laminated plastic nameplate.

3.7 FIELD QUALITY CONTROL

A. Subcontractor must field inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Acceptance Testing Preparation:

1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

C. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace them with new units and retest.
3. Perform the following infrared scan tests and inspections and prepare reports:

   a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Substantial completion, perform an infrared scan of each enclosed switch and circuit breaker. Remove front panels so joints and connections are accessible to portable scanner.
   b. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.8 ADJUSTING

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges at values as per drawings.

END OF SECTION 26 28 16

SECTION 28 46 20 - FIRE ALARM

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:

1. This specification describes components of an existing addressable fire detection and alarm signaling system that are to be tested, removed and safely stored during construction, and reinstalled, and tested for a complete functional system.
2. The existing devices and system's components are that of Siemens XLS.

B. Summary of Work

1. There is an existing addressable Temporal-3 Fire Alarm System and existing Fire Alarm Control Panel (FACP) by Siemens XLS. Existing FACP and entire system must remain. Existing Fire alarm System sequence of operation must be maintained.
2. Prior to start of work, Subcontractor must test the devices, modules and other equipment being removed and stored, for proper operation and functioning as applicable. Coordinate with Building Fire Alarm Maintenance Subcontractor AFEC Fire Protection for proper equipment operation. Contact Mr. Angelo Coiro at (516) 605-0423 and via email a.coiro@afecinc.com. Provide test report denoting any deficiencies. All deficiencies to be rectified prior to start of the balance of the contract work.
3. Subcontractor must provide and install devices as depicted on construction documents and as required with all necessary associated sensors, relays, modules, wiring and conduit and program reinstalled devices per existing system sequence of operation.
4. Contract must cover the cost of devices and associated wiring and conduit to be disconnected and removed, stored, and reinstalled, and coordination with Building Fire Alarm Maintenance Subcontractor AFEC Fire Protection.
5. Subcontractor must also cover cost for adjustments of programming to allow for devices to be removed, added and/or relocated as required.

1.3 SYSTEM DESCRIPTION

A. Existing Siemens XLS System – is a complete electrically supervised fire detection, alarm and notification system, with a microprocessor-based operating system.

B. Activation of System operated existing duct detectors must accomplish:

1. HVAC units' fans shut down.
2. Identify individual device and display at the local fire alarm control panel LCD display and all associated existing alpha-numeric displays of the system, the origin of the condition.
3. Activate all audible alarms.
4. Activate all visual alarms (synchronized).
5. Activate door release / magnetic door holders (via security system).
6. Activate audible signal at main FACP. Send smoke signal to Central Station.
7. Close fire smoke dampers.
8. Record within system history the initiating device and time of occurrence of the event.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.5 SUBMITTALS

A. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

B. As built wiring diagram must be the responsibility of the Subcontractor.

C. Subcontractor must supply the as built NYC FD required riser, Commissioner must sign and seal.

D. Subcontractor must arrange NYC FD site inspection.

1. Detail components, and location and size of each field connection.
2. Wiring Diagrams: For power, signal, and control wiring.
3. Installation drawings, shop drawings, and as-built drawings must be prepared by an individual experienced with the work specified herein.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Manufacturer Qualifications: The publications listed below form a part of this publication to the extent referenced. The publications are referenced in the text by the basic designation only. The latest version of each listed publication must be used as a guide.

1. FM Global (Factory Mutual (FM)):FM Approval Guide
2. National Fire Protection Association (NFPA)
    a. NFPA 70 National Electrical Code
    b. NFPA 72 National Fire Alarm Code
    c. NFPA 90A Standard for The Installation of Air Conditioning and Ventilating Systems

d. NFPA 92 – Standard for Smoke Control Systems
e. NFPA 2001, Standard for the installation of Clean Agent fire suppression
f. NFPA 13, and NFPA 25
g. NFPA 720
h. NFPA 101 Life Safety Code

3. Underwriters' Laboratories, Inc. (UL) equipment standards, Latest Edition

a. UL Fire Protection Equipment Directory
b. UL Electrical Construction Materials Directory
c. UL 268 - Smoke Detectors for Fire Protective Signaling Systems
d. UL 268A - Smoke Detectors for Duct Application

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. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Perform work in accordance with the requirements of NFPA 70, NFPA 72, NFPA 13, NFPA 2001, and NECA 1-2006, Standard of Good Workmanship in Electrical Contracting.

B. Fasten equipment to structural members of building or metal supports attached to structure, or to concrete surfaces.

C. In the event that limited energy cable installation is allowed, all cable runs must be run at right angles to building walls, supported from structure at intervals not exceeding 3 feet and where installed in environmental air plenums, be rated for such use and tied/supported by components listed for environmental air plenums installation.

D. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Conceal raceway and cables except in unfinished spaces.

E. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.4 BOXES, ENCLOSURES AND WIRING DEVICES

A. Boxes must be installed plumb and firmly in position.

B. Extension rings with blank covers must be installed on junction boxes where required.

C. Junction boxes served by concealed conduit must be flush mounted.

D. Upon initial installation, all wiring outlets, junction, pull and outlet boxes must have dust covers installed. Dust covers must not be removed until wiring installation when permanent dust covers or devices are installed.

E. "Fire alarm system" decal or silk-screened label must be applied to all junction box covers. Panel enclosures must be installed to meet clearance requirements per NFPA 70. Minimum requirements must be 3-foot clearance in front of the enclosure.

3.5 CONDUCTORS

A. Each conductor must be identified as shown on the drawings at each with wire markers at terminal points. Attach permanent wire markers within 2 inches of the wire termination. Marker legends must be visible.

B. All wiring must be supplied and installed in compliance with the requirements of the National Electric Code, NFPA 70, Article 760, and that of the manufacturer.

C. Wiring for strobe and audible circuits must be a minimum 14 AWG, signal line circuits; 18 AWG twisted shielded, speaker circuits; 18 AWG twisted, telephone circuit; 18 AWG twisted shielded.

D. All splices must be made using solder-less connectors. All connectors must be installed in conformance with the manufacturer recommendations.

E. Crimp-on type spade lugs must be used for terminations of stranded conductors to binder screw or stud type terminals. Spade lugs must have upset legs and insulation sleeves sized for the conductors.

F. The installation Subcontractor must submit for approval prior to installation of wire, a proposed color code for system conductors to allow rapid identification of circuit types.

G. Wiring within sub panels must be arranged and routed to allow accessibility to equipment for adjustment and maintenance.

3.6 DEVICES

A. All devices and appliances must be mounted to or in an approved electrical box.

3.7 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

B. Permanently label or mark each conductor at both ends with permanent alphanumeric wire markers.

C. A consistent color code for fire alarm system conductors throughout the installation.

3.8 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Testing General:

1. All Alarm Initiating Devices must be observed and logged for correct zone and sensitivity. These devices and their bases must be tagged with adhesive tags located in an area not visible when installed, showing the initials of the installing technician and date.
2. Wiring runs must be tested for continuity, short circuits and grounds before system is energized. Resistance, current and voltage readings must be made as work progresses.
3. The acceptance inspector must be notified before the start of the required tests. All items found at variance with the drawings or this specification during testing or inspection by the acceptance inspector must be corrected.
4. Test reports must be delivered to the acceptance inspector as completed.

3.9 DOCUMENTATION

A. System documentation must be furnished to the City of New York and must include but not be limited to the following:

1. System record drawings and wiring details for all equipment affected by this contract. Including one set of reproducible drawings, and copies of the record drawings in DXF format for use in a CAD drafting program.
2. System operation, installation and maintenance manuals for all equipment affected by this contract.
3. System matrix showing interaction of all input signals with output commands.

3.10 PROTECTION

A. Remove and replace devices and panel components that are wet, moisture damaged, or mold damaged.

END OF SECTION 28 46 20

FMS ID: **HH112FTRF**

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

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

Department of Design and Construction

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

Fort Washington Armory Roof Replacement / HVAC Upgrade

LOCATION: **216 Fort Washington Avenue**
BOROUGH: **Manhattan, NY 10032**
CITY OF NEW YORK

Contractor

Dated _____ , 20 _____

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____ , 20 _____

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

ADDENDA CONTROL SHEET

BID SUBMISSION DATE/ TIME: September 17, 2025; between 11:30am & 2:00pm
BID OPENING DATE/ TIME: September 17, 2025; 2:30pm

PROJECT No. : **HH112FTRF**

TITLE: **Fort Washington Armory Roof Replacement/ HVAC Upgrade**

ADDENDA ISSUED	NO. OF DWG	DATE	APPROVED BY: ARCHITECTURE/ ENGINEERING	APPROVED BY: GENERAL COUNSEL
#1 Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		9/8/25	SZ	9/8/25

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

September 8, 2025

ADDENDUM No. # 1

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

85024B0074 – HH112FTRF

Fort Washington Armory Roof Replacement/ HVAC Upgrade

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. (Not Used)

3. **Revisions to PASSPort forms:**
   See Attachment C.

Transferring Data Between Rounds of an RFX: A new document titled "Transferring Data Between Rounds of an RFX" has been added to the Documents section of the View RFx tab. Please refer to this document when an addendum has been issued. Note: Whenever an addendum is issued, the RFX item grid will be cleared. You can import the work you have already done by following the steps on this document.

DDC strongly advises vendors to finalize and submit bids 48 hours prior to due date and time. The City is not responsible for technical issues (e.g. internet connection, power outages, technology malfunction, computer errors, etc.) related to bid submissions.

If additional information is required, please contact the Department of Design and Construction, Contract Section via PASSPort (in the Discussions with Buyer section).

Richard Jones, PE CWI CDT
Chief Engineer

DDC PROJECT #: **HH112FTRF**

PROJECT NAME: **Fort Washington Armory Roof Replacement / HVAC Upgrade**

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

No.	Bidders Questions	DDC Responses
1	On drawing A-404, details 1,2,4 & 5, there is a note indicating the following: "Existing Terracotta coping to be removed, reglazed and reinstalled to match existing condition". The manmade terracotta stones are suitable to lose properties through time due to the exposure to weather conditions. Most of the existing terracotta copings are showing "hair" crack on their surface; this is an indication that those cracks are the result of inside out pressure creating a potential risk crack during the removal. Furthermore, to comply with the Building Code for stone anchoring design systems, the terracotta coping needs to be re-tooled to accommodate new anchors. This will create another potential risk of cracking/breaking them. Please advise if it is feasible to reconsider the terracotta coping scope to fully replace them in shape, profile, color and finish instead of reusing them.	Current details and requirements to remain. Details of Terracotta coping are provided on A-404: 1/404, 2/404, 4/404, and 5/404. Repair details for Terracotta are provided on A-504: 4/504, 5/504, 7/504, 8/504, and 9/504. If during construction, the Contractor observes issues with breakage or concerns with the existing terra cotta units, inform the Commissioner.

DDC PROJECT #: **HH112FTRF**

PROJECT NAME: **Fort Washington Armory Roof Replacement / HVAC Upgrade**

ATTACHMENT B – REVISIONS TO THE DOCUMENTS

NOT USED

DDC PROJECT #: **HH112FTRF**

PROJECT NAME: **Fort Washington Armory Roof Replacement / HVAC Upgrade**

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.

Questionnaire Changes:

None

Item Grid Changes:

None

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

ADDENDA CONTROL SHEET

BID SUBMISSION DATE/ TIME: September 17, 2025; between 11:30am & 2:00pm
BID OPENING DATE/ TIME: September 17, 2025; 2:30pm

PROJECT No. : **HH112FTRF**

TITLE: **Fort Washington Armory Roof Replacement/ HVAC Upgrade**

ADDENDA ISSUED	NO. OF DWG	DATE	APPROVED BY: ARCHITECTURE/ ENGINEERING	APPROVED BY: GENERAL COUNSEL
#1 Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		9/8/25		
#2 Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		9/11/25	SZ	9/11/2025

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

September 11, 2025

ADDENDUM No. # 2

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

85024B0074 – HH112FTRF

Fort Washington Armory Roof Replacement/ HVAC Upgrade

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:**
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If additional information is required, please contact the Department of Design and Construction, Contract Section via PASSPort (in the Discussions with Buyer section).

Richard Jones, PE CWI CDT
Chief Engineer

DDC PROJECT #: **HH112FTRF**

PROJECT NAME: **Fort Washington Armory Roof Replacement / HVAC Upgrade**

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

No.	Bidders Questions	DDC Responses
1	Some drawings appear to be missing, particularly those related to exterior details such as guardrails and similar items. Could you please confirm whether updated drawings covering these elements will be provided in the coming day?	No additional drawings will be provided. Exterior details can be found on the following Drawing sheets: A-005, A-404, A-501, A-502, A-503, A-504, and A-505. Specifically, details of guardrails provided on A-005 are found on 2/005, 3/005, 4/005, and 5/005. Structural details of Guardrails can be found on S-300: 1/300, 2/300, 3/300, 4/300, 5/300, 6/300, and 7/300. Current details and requirements are to remain.

DDC PROJECT #: **HH112FTRF**

PROJECT NAME: **Fort Washington Armory Roof Replacement / HVAC Upgrade**

ATTACHMENT B – REVISIONS TO THE DOCUMENTS

NOT USED

DDC PROJECT #: **HH112FTRF**

PROJECT NAME: **Fort Washington Armory Roof Replacement / HVAC Upgrade**

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.

Questionnaire Changes:

None

Item Grid Changes:

None

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

ADDENDA CONTROL SHEET

BID SUBMISSION DATE/ TIME: September 17, 2025; between 11:30am & 2:00pm
BID OPENING DATE/ TIME: September 17, 2025; 2:30pm

PROJECT No. : **HH112FTRF**

TITLE: **Fort Washington Armory Roof Replacement/ HVAC Upgrade**

ADDENDA ISSUED	NO. OF DWG	DATE	APPROVED BY: ARCHITECTURE/ ENGINEERING	APPROVED BY: GENERAL COUNSEL
#1 Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		9/8/25		
#2 Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		9/11/25		
#3 Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		9/16/25	LW	9/16/2025

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

September 16, 2025

ADDENDUM No. # 3

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

85024B0074 – HH112FTRF

Fort Washington Armory Roof Replacement/ HVAC Upgrade

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:**
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If additional information is required, please contact the Department of Design and Construction, Contract Section via PASSPort (in the Discussions with Buyer section).

Richard Jones, PE CWI CDT
Chief Engineer

DDC PROJECT #: **HH112FTRF**

PROJECT NAME: **Fort Washington Armory Roof Replacement / HVAC Upgrade**

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

No.	Bidders Questions	DDC Responses
1	Note 2 on S202 calls for 40% of masonry wall area to be repointed. Please confirm if it's 40% of the area within the dashed line or 40% of the whole facade. Also please confirm that this only applies to 1/S202 or does it apply all the masonry facade area.	Note 2 on S-202 refers to 40% of the area within the dashed line and is only applicable to 1/S-202 West Elevation. For other masonry façades with dashed areas indicated to be repointed, assume it applies to 100% of the area within the dashed line unless otherwise noted. Current details and requirements to remain.

DDC PROJECT #: **HH112FTRF**

PROJECT NAME: **Fort Washington Armory Roof Replacement / HVAC Upgrade**

ATTACHMENT B – REVISIONS TO THE DOCUMENTS

Not Used

DDC PROJECT #: **HH112FTRF**

PROJECT NAME: **Fort Washington Armory Roof Replacement / HVAC Upgrade**

ATTACHMENT C – REVISIONS TO PASSPORT FORMS

This Addendum is included in Round 1 of the procurement.

Please note that numbering of addenda is independent of rounds.

Questionnaire Changes:

None

Item Grid Changes:

None