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. One-page signed Bid Submission Form delivered in person to DDC before the bid due date; and
3. Bid security, if required.
    a. If Bid security is in a form of a bid bond, bidders must include it with their electronic PASSPort submission.
    b. If Bid security is in a form of a certified check, bidders must deliver the certified check with the signed Bid Submission Form.

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

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

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

Notices to Bidders

Project Labor Agreement & Single Contract

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

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

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

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

Pre Bid Questions (PBQs)

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

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

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

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

NYC Contract Financing Loan Fund

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

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

M/WBE Notice to Prospective Contractors

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

ARTICLE I. M/WBE PROGRAM

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

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

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

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

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

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

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

PART A

PARTICIPATION GOALS FOR CONSTRUCTION, STANDARD

AND PROFESSIONAL SERVICES CONTRACTS OR TASK ORDERS

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

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

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

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

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

4. A. If **Participation Goals** have been established for this Contract, a prospective contractor shall be required to submit with its bid or proposal, as applicable, a completed Schedule B, M/WBE Utilization Plan, Part 2 (see 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.

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

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

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

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

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

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

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

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

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

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

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

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

(5) List of key material suppliers.

(6) Preliminary bar chart time schedule

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

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

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

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

Project References

A. Contracts completed by the bidder

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

Project & Location	Contract Type	Contract Amount ($000)	Date Completed	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. (if different from owner)

B. Contracts currently under construction by the bidder

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

Project & Location	Contract Type	Contract Amount ($000)	Subcontracted to Others ($000)	Uncompleted Portion ($000)	Date Scheduled to Complete	Owner Reference & Tel. No.	Architect/ Engineer Reference & Tel. No. (if different from owner)

C. Pending contracts not yet started by the bidder

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

Project & Location	Contract Type	Contract Amount ($000)	Date Scheduled to Start	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. (if different from owner)

CSI Number	Description	Quantity	Unit	Unit Cost Of Material	Total Cost Of Material	Unit Cost Of Labor	Total Cost Of Labor	Total Cost: Materials & Labor
01 00 00	**GENERAL REQUIREMENTS**							
	PROJECT MANAGER	1	LS	$ -	$ -	$ 180,000.00	$ 180,000.00	$ 180,000.00
	PROJECT SUPERINTENDENT	1	LS	$ -	$ -		$ -	N/A
	SCHEDULER	1	LS	$ -	$ -	$ 10,000.00	$ 10,000.00	$ 10,000.00
	OFFICE SUPPLIES	1	LS	$ -	$ -	$ -	$ -	N/A
	PHONE / FAX / INTERNET	1	LS	$ -	$ -	$ -	$ -	N/A
	ELECTRIC HOOK-UP & USAGE	1	LS	$ -	$ -	$ -	$ -	N/A
	WATER HOOK-UP & USAGE	1	LS	$ -	$ -	$ -	$ -	N/A
	TOILETS / SANITARY SERVICE	1	LS	$ -	$ -	$ -	$ -	N/A
	HEAT / WINTER PROTECTION	1	LS	$ -	$ -	$ -	$ -	N/A
	PERMITS / FEES	1	LS	$ -	$ -	$ 5,000.00	$ 5,000.00	$ 5,000.00
	PROGRESS MEETINGS	1	LS	$ -	$ -	$ -	$ -	N/A
	DUMPSTERS / TRASH REMOVAL	1	LS	$ 4,000.00	$ 4,000.00	$ 15,000.00	$ 15,000.00	$ 19,000.00
	TESTING	1	LS	$ -	$ -	$ 20,000.00	$ 20,000.00	$ 20,000.00
	FLOOR PROTECTION	1	LS	$ 4,800.00	$ 4,800.00	$ 19,000.00	$ 10,000.00	$ 14,800.00
	FINAL CLEANING	1	LS	$ 600.00	$ 600.00	$ 11,000.00	$ 10,000.00	$ 10,600.00
	AS-BUILTS & CLOSEOUT DOCUMENTS	1	LS	$ -	$ -	$ -	$ 7,000.00	$ 7,000.00
	SITE SUPERVISION	1	LS	$ -	$ -	$ -	$ -	Same as PM
	JANITORIAL SERVICE	1	LS	$ -	$ -	$ -	$ -	N/A
	PROJECT SIGNS	1	LS	$ 1,000.00	$ 1,000.00	$ 2,000.00	$ 2,000.00	$ 3,000.00
	FINAL SITE REVIEW	1	LS	$ -	$ -	$ -	$ -	N/A
	MOBILIZATION	1	LS	$ -	$ -	$ 374,000.00	$ 374,000.00	$ 374,000.00
	Subtotal GENERAL REQUIREMENTS =							**$ 643,400.00**

CSI Number	Description	Quantity	Unit	Unit Cost Of Material	Total Cost Of Material	Unit Cost Of Labor	Total Cost Of Labor	Total Cost: Materials & Labor
02 00 00	**EXISTING CONDITIONS**							
02 41 13	SELECTIVE SITE DEMOLITION							
	TEMPORARILY REMOVE AND SAVE FOR RE-USE EXISTING ACT TILE	25	SF	$ 10.00	$ 250.00	$ 48.00	$ 1,200.00	$ 1,450.00
	AND GRID DUE TO DUCTWORK REMOVAL AT CELLAR							
	REMOVE EXISTING ACT CEILING AND GRID (HANGERS TO REMAIN)	7,035	SF	$ 0.20	$ 1,407.00	$ 2.40	$ 16,884.00	$ 18,291.00
	REMOVE EXISTING DROPPED CEILING FOR INSTALLATION OF NEW	30	SF	$ -	$ -	$ -	$ -	$ -
	TOILET VENTILATION FAN ON 1ST FLOOR (FINISH UNKNOWN)							
	REMOVE EXISTING DROPPED CEILING FOR INSTALLATION OF NEW	405	SF	$ 1.00	$ 405.00	$ 8.00	$ 3,240.00	$ 3,645.00
	DUCTWORK ON 2ND FLOOR (GWB; HANGERS TO REMAIN)							
	REMOVE EXISTING GWB CEILING (HANGERS TO REMAIN)	1,365	SF	$ 2.00	$ 2,730.00	$ 20.00	$ 27,300.00	$ 30,030.00
	REMOVE EXISTING GWB CEILING ACCESS PANELS AT ABOVE	6	EA	$ 39.00	$ 234.00	$ 260.00	$ 1,560.00	$ 1,794.00
	REMOVE EXISTING GWB SOFFIT AT DUCTWORK, (2) LOCATIONS	18	SF	$ 13.00	$ 234.00	$ 187.00	$ 3,366.00	$ 3,600.00
	REMOVE EXISTING GWB WINDOW HEAD SOFFITS (PARTIAL REMOVAL	90	SF	$ 3.00	$ 270.00	$ 37.00	$ 3,330.00	$ 3,600.00
	DUE TO PERIMETER HVAC LINEAR DIFFUSERS INSTALLATION),							
	MULTIPLE LOCATIONS ON 1ST AND 2ND FLOORS							
	REMOVE EXISTING SHAFT WALL (GWB ON METAL STUDS TO SLAB)	178	SF	$ 1.00	$ 178.00	$ 19.00	$ 3,382.00	$ 3,560.00
	W/ ASSOCIATED ACCESS HATCHES ON 2ND FLOOR							
	OPEN EXISTING PIPE CHASE FOR REMOVAL OF EXIST. REFRIGERANT	1	LOC	$ 120.00	$ 120.00	$ 1,680.00	$ 1,680.00	$ 1,800.00
	PIPING ON 2ND FLOOR							
	SAWCUT EXISTING EXTERIOR MASONRY WALL FOR NEW LOUVERS,	2	LOC	$ 600.00	$ 1,200.00	$ 3,000.00	$ 6,000.00	$ 7,200.00
	(2) 10" X 10" OPENINGS FOR (2) 6" X 6" LOUVERS							
	SAWCUT EXISTING EXTERIOR MASONRY WALL AT NEW DUCTWORK	20	SF	$ 30.00	$ 600.00	$ 150.00	$ 3,000.00	$ 3,600.00
	PROTRUSION AT PENTHOUSE							
	REMOVE EXISTING LOUVER VENT PANELS AT PENTHOUSE	102	SF	$ 2.00	$ 204.00	$ 21.00	$ 2,142.00	$ 2,346.00
	REMOVE EXISTING ROOF MEMBRANE ASSEMBLY / SAWCUT EXISTING	2	LOC	$ -	$ -	$ 1,700.00	$ 3,400.00	$ 3,400.00
	CONCRETE ROOF SLAB TO CREATE NEW OPENINGS THROUGH							
	EXISTING PENTHOUSE ROOF, (2) 30" X 26" OPENINGS							
	REMOVE EXISTING ROOF MEMBRANE ASSEMBLY / SAWCUT EXISTING	1	LOC	$ 600.00	$ 600.00	$ 1,700.00	$ 1,700.00	$ 2,300.00
	CONCRETE ROOF SLAB TO CREATE NEW OPENING THROUGH							
	EXISTING ROOF FOR GOOSENECK FAN, (1) 14" X 14" OPENING							

CSI Number	Description	Quantity	Unit	Unit Cost Of Material	Total Cost Of Material	Unit Cost Of Labor	Total Cost Of Labor	Total Cost: Materials & Labor
	REMOVE EXISTING ROOF MEMBRANE ASSEMBLY / SAWCUT EXISTING	20	LOC	$ 730.00	$ 14,600.00	$ 4,200.00	$ 84,000.00	$ 98,600.00
	CONCRETE ROOF SLAB TO INSTALL NEW CONCRETE PEDESTALS							
	FOR SOUND BARRIER WALL STEEL FRAMING SUPPORT							
	REMOVE EXISTING ROOF MEMBRANE ASSEMBLY / SAWCUT EXISTING	8	LOC	$ 280.00	$ 2,240.00	$ 1,700.00	$ 13,600.00	$ 15,840.00
	CONCRETE ROOF SLAB TO INSTALL NEW STEEL DUNNAGE POSTS							
	MISCELLANEOUS REMOVALS / SAWCUTTING	3	FLR	$ 200.00	$ 600.00	$ 1,000.00	$ 3,000.00	$ 3,600.00
	LOAD / HAUL DEBRIS OFF-SITE	1	LS	$ -	$ -	$ 1,200.00	$ 1,200.00	$ 1,200.00
02 80 13	ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT							
	INCIDENTAL ASBESTOS ABATEMENT WORK	1	LS	$ -	$ -	$ 15,000.00	$ 15,000.00	$ 15,000.00
	Subtotal EXISTING CONDITIONS =							**$ 220,856.00**
03 00 00	**CONCRETE**							$ -
03 10 00	CONCRETE FORMING AND ACCESSORIES							INCL. W/ 03 30 00
03 20 00	CONCRETE REINFORCING							INCL. W/ 03 30 00
03 30 00	CAST-IN-PLACE CONCRETE							
	INFILL EXISTING OPENINGS IN EXISTING PENTHOUSE ROOF - REINFOR.	2	LOC	$ 300.00	$ 600.00	$ 2,100.00	$ 4,200.00	$ 4,800.00
	CONCRETE ON METAL DECK (FOR STEEL ANGLE SUPPORTS - SEE							
	METALS), (2) 30" X 26" OPENINGS							
	PATCH AND REPAIR EXISTING CONCRETE ROOF SLAB AT REMOVED	2	LOC	$ 300.00	$ 600.00	$ 900.00	$ 1,800.00	$ 2,400.00
	PIPE VENT OPENINGS IN EXISTING PENTHOUSE ROOF							
	NEW 12" X 12" CONCRETE PEDESTALS TO SUPPORT SOUND BARRIER	20	EA	$ 600.00	$ 12,000.00	$ 3,000.00	$ 60,000.00	$ 72,000.00
	WALL STEEL FRAMING (INCL. SHEAR STUDS)							
	PATCH AND REPAIR EXISTING CONCRETE ROOF SLAB DUE TO ABOVE	20	LOC	$ 180.00	$ 3,600.00	$ 1,020.00	$ 20,400.00	$ 24,000.00
	CONCRETE PEDESTALS INSTALLATION							
	PATCH AND REPAIR EXISTING CONCRETE ROOF SLAB DUE TO NEW	8	LOC	$ 150.00	$ 1,200.00	$ 1,050.00	$ 8,400.00	$ 9,600.00
	STEEL DUNNAGE POSTS INSTALLATION							

CSI Number	Description	Quantity	Unit	Unit Cost Of Material	Total Cost Of Material	Unit Cost Of Labor	Total Cost Of Labor	Total Cost: Materials & Labor
	MISCELLANEOUS PATCHING OF EXISTING CONCRETE ROOF SLAB	1	LS	$ 120.00	$ 120.00	$ 900.00	$ 900.00	$ 1,020.00
	DUE TO NEW SLAB OPENINGS, (3) LOCATIONS							
	PATCH AND REPAIR EXISTING CONCRETE SLAB SURFACES DUE TO	3	FLR	$ 120.00	$ 360.00	$ 900.00	$ 2,700.00	$ 3,060.00
	MEPS WORK							
03 60 00	GROUTING - INCL. W/ 05 12 00							
	Subtotal CONCRETE =							**$ 116,880.00**
04 00 00	**MASONRY**							$ -
04 20 00	UNIT MASONRY							
	PATCH AND REPAIR EXISTING 16" X 16" OPENINGS IN INTERIOR CMU	3	LOC	$ 100.00	$ 300.00	$ 700.00	$ 2,100.00	$ 2,400.00
	PARTITIONS							
	PATCH AND REPAIR EXISTING 48" X 16" OPENING IN INTERIOR CMU	1	LOC	$ 250.00	$ 250.00	$ 2,700.00	$ 2,700.00	$ 2,950.00
	PARTITION							
	PATCH AND REPAIR EXISTING INTERIOR CMU PARTITIONS DUE TO MEPS	1	FLR	$ 250.00	$ 250.00	$ 2,100.00	$ 2,100.00	$ 2,350.00
	WORK							
	PATCH EXISTING EXTERIOR MASONRY WALL DUE TO NEW LOUVERS	2	LOC	$ 250.00	$ 500.00	$ 2,100.00	$ 4,200.00	$ 4,700.00
	INSTALLATION (INCL. SLOPED MORTAR BED)							
	PATCH EXISTING EXTERIOR MASONRY WALL / NEW BOND BEAMS AT	1	LS	$ 500.00	$ 500.00	$ 3,000.00	$ 3,000.00	$ 3,500.00
	NEW DUCTWORK PROTRUSION OPENINGS AT PENTHOUSE							
	INFILL EXISTING LOUVER VENT OPENINGS IN PENTHOUSE WALL W/ CMU	102	SF	$ 29.00	$ 2,943.50	$ 147.00	$ 14,920.50	$ 17,864.00
	BACK-UP WALL AND BRICK VENEER TO MATCH EXISTING							
	ENCLOSE EXISTING PENTHOUSE SHAFT WALLS W/ FULLY-GROUTED	32	SF	$ 389.00	$ 12,448.00	$ 262.00	$ 8,384.00	$ 20,832.00
	MASONRY UNITS (PER DETAIL 4 / A-204.00) - RECONSTRUCT EXIST.							
	DETERIORATED CMU PARTITION, CREATE NEW DUCT OPENINGS W/							
	ASSOCIATED BOND BEAMS AND LINTELS, QTY PER DETAIL							

CSI Number	Description	Quantity	Unit	Unit Cost Of Material	Total Cost Of Material	Unit Cost Of Labor	Total Cost Of Labor	Total Cost: Materials & Labor
04 42 13	ACOUSTICAL BARRIER WALLS							
	NEW ACOUSTICAL BARRIER WALL AT ROOF, W/ ASSOCIATED DOOR	1,073	SF	$ 84.00	$ 90,132.00	$ 17.90	$ 20,387.00	$ 110,519.00
	(FOR STEEL FRAMING - SEE METALS)							
	Subtotal MASONRY =							**$ 165,115.00**
05 00 00	**METALS**							
05 12 00	STRUCTURAL STEEL FRAMING							
	NEW STRUCTURAL STEEL SUPPORT FOR EXISTING FILLED IN OPENINGS	105	LBS	$ 44.00	$ 4,620.00	$ 154.00	$ 16,170.00	$ 20,790.00
	IN EXISTING PENTHOUSE ROOF (ANGLES AT 4 SIDES OF OPENING)							
	NEW STRUCTURAL STEEL FRAMING FOR NEW PENETRATIONS THROUGH	544	LBS	$ 10.00	$ 5,440.00	$ 38.00	$ 20,672.00	$ 26,112.00
	EXISTING PENTHOUSE ROOF (C-MEMBERS)							
	NEW STRUCTURAL STEEL FRAMING FOR NEW PENETRATIONS THROUGH	195	LBS	$ 16.00	$ 3,120.00	$ 100.00	$ 19,500.00	$ 22,620.00
	EXISTING PENTHOUSE EXTERIOR WALL DUE TO NEW DUCTWORK							
	PROTRUSION (2-ANGLE LINTELS)							
	NEW STRUCTURAL STEEL FRAMING FOR NEW SOUND BARRIER WALL	6,246	LBS	$ 5.00	$ 31,230.00	$ 16.00	$ 99,936.00	$ 131,166.00
	(W-MEMBERS, ANGLE SHEAR CONNECTIONS)							
	NEW STRUCTURAL STEEL DUNNAGE FOR NEW ROOFTOP HVAC UNITS	3,137	LBS	$ 6.00	$ 18,822.00	$ 13.00	$ 40,781.00	$ 59,603.00
	(W-MEMBERS, CAP AND BASE PLATES, HSS POSTS)							
	NEW STRUCTURAL STEEL FRAMING FOR NEW ROOF GOOSENECK FAN	215	LBS	$ 14.00	$ 3,010.00	$ 42.00	$ 9,030.00	$ 12,040.00
	PENETRATION THROUGH EXISTING ROOF (C-MEMBERS)							
05 30 00	METAL DECKING - INCL. W/ 05 12 00							
05 50 00	METAL FABRICATIONS - INCL. W/ 05 12 00							
	Subtotal METALS =							**$ 272,331.00**

CSI Number	Description	Quantity	Unit	Unit Cost Of Material	Total Cost Of Material	Unit Cost Of Labor	Total Cost Of Labor	Total Cost: Materials & Labor
07 00 00	**THERMAL AND MOISTURE PROTECTION**							$ -
07 52 00	ROOF FLASHING AND RELATED ROOF REPAIR WORK							
	PATCH / REPAIR EXISTING ROOF MEMBRANE ASSEMBLY AT INFILLED	2	LOC	$ 660.00	$ 1,320.00	$ 3,200.00	$ 6,400.00	$ 7,720.00
	OPENINGS IN EXISTING PENTHOUSE ROOF, (2) 30" X 26" OPENINGS							
	PATCH / REPAIR EXISTING ROOF MEMBRANE ASSEMBLY AT INFILLED	2	LOC	$ 660.00	$ 1,320.00	$ 3,200.00	$ 6,400.00	$ 7,720.00
	PIPE VENT OPENINGS IN EXISTING PENTHOUSE ROOF							
	PATCH / REPAIR EXISTING ROOF MEMBRANE ASSEMBLY DUE TO NEW	2	LOC	$ 660.00	$ 1,320.00	$ 3,200.00	$ 6,400.00	$ 7,720.00
	OPENINGS IN EXISTING PENTHOUSE ROOF, INCL. NEW FLASHING							
	PATCH / REPAIR EXISTING ROOF MEMBRANE ASSEMBLY DUE TO NEW	1	LOC	$ 660.00	$ 660.00	$ 3,200.00	$ 3,200.00	$ 3,860.00
	GOOSENECK FAN OPENING IN EXISTING ROOF, INCL. NEW CONC.							
	CURB AND FLASHINGS							
	PATCH / REPAIR EXISTING ROOF MEMBRANE ASSEMBLY AT EXISTING	2	LOC	$ 660.00	$ 1,320.00	$ 3,200.00	$ 6,400.00	$ 7,720.00
	RE-USED EXHAUST FAN OPENINGS IN EXISTING ROOF, INCL. NEW							
	FLASHINGS							
	PATCH / REPAIR EXISTING ROOF MEMBRANE ASSEMBLY DUE TO NEW	20	LOC	$ 660.00	$ 13,200.00	$ 3,200.00	$ 64,000.00	$ 77,200.00
	CONCRETE PEDESTALS INSTALLATION TO SUPPORT NEW SOUND							
	BARRIER WALL STEEL FRAMING							
	PATCH / REPAIR EXISTING ROOF MEMBRANE ASSEMBLY DUE TO NEW	8	LOC	$ 660.00	$ 5,280.00	$ 3,200.00	$ 25,600.00	$ 30,880.00
	STEEL DUNNAGE POSTS INSTALLATION							
	NEW PITCH POCKETS AT NEW DUNNAGE POSTS AND NEW CONCRETE	28	EA	$ -	$ -	$ 175.00	$ 4,900.00	$ 4,900.00
	PEDESTALS (NO DETAIL AT CONCRETE PEDESTAL, ASSUMED							
	SIMILAR CONDITION AS AT DUNNAGE POSTS)							
	FIREPROOFING							
	PATCH / REPAIR EXISTING FIREPROOFING AFFECTED BY DEMOLITION	8,860	SF	$ 0.50	$ 4,430.00	$ 2.50	$ 22,150.00	$ 26,580.00
	AND INSTALLATION OF CEILINGS AND DUE TO MEPS WORK							
	MISCELLANEOUS FIREPROOFING OF NEW STEEL FRAMING (AT ROOF	1	LS	$ 500.00	$ 500.00	$ 5,500.00	$ 5,500.00	$ 6,000.00
	OPENINGS) AND AT SLAB INFILLS							
07 84 00	FIRESTOPPING - INCL. W/ ASSOCIATED MEPS TRADES							

CSI Number	Description	Quantity	Unit	Unit Cost Of Material	Total Cost Of Material	Unit Cost Of Labor	Total Cost Of Labor	Total Cost: Materials & Labor
07 92 00	JOINT SEALANTS - INCL. W/ ASSOCIATED NEW CONSTRUCTION - INCL. W/ 09 21 00, 09 21 16.23, 10 21 40							
	Subtotal THERMAL AND MOISTURE PROTECTION =							**$ 180,300.00**
08 00 00	**OPENINGS**							$ -
08 31 00	ACCESS DOORS AND PANELS							
	NEW 20" X 20" 2HR-RATED SHAFT WALL ACCESS PANELS	2	EA	$ 300.00	$ 600.00	$ 900.00	$ 1,800.00	$ 2,400.00
	NEW 18" X 18" FLUSH-MOUNTED CEILING ACCESS PANELS	13	EA	$ 600.00	$ 7,800.00	$ 600.00	$ 7,800.00	$ 15,600.00
	NEW 12" X 12" FLUSH-MOUNTED CEILING ACCESS PANEL	1	EA	$ 300.00	$ 300.00	$ 900.00	$ 900.00	$ 1,200.00
	Subtotal OPENINGS =							**$ 19,200.00**
09 00 00	**FINISHES**							$ -
09 21 00	GYPSUM DRYWALL SYSTEMS							
	PATCH AND REPAIR EXISTING GWB CEILING AT AREA OF REMOVED REGISTER IN CELLAR	1	LOC	$ 300.00	$ 300.00	$ 2,700.00	$ 2,700.00	$ 3,000.00
	NEW GWB CEILING ASSEMBLY ON EXISTING HANGERS	1,770	SF	$ 20.00	$ 35,400.00	$ 51.00	$ 90,270.00	$ 125,670.00
	NEW GWB SOFFITS / FASCIAE AT CEILING HEIGHT TRANSITIONS	487	SF	$ 20.00	$ 9,740.00	$ 54.00	$ 26,298.00	$ 36,038.00
	EXTEND AND RECONSTRUCT EXISTING WINDOW HEAD SOFFITS	155	LF	$ 23.00	$ 3,565.00	$ 132.00	$ 20,460.00	$ 24,025.00
	CUT-OUTS IN NEW GWB CEILINGS FOR CEILING-MOUNTED FIXTURES AND DEVICES	1	LS	$ 240.00	$ 240.00	$ 2,160.00	$ 2,160.00	$ 2,400.00
	PATCH AND REPAIR EXISTING GWB WALL SURFACES DUE TO MEPS WORK	2	FLR	$ 1,800.00	$ 3,600.00	$ 7,200.00	$ 14,400.00	$ 18,000.00
09 21 16.23	GYPSUM BOARD SHAFT WALL ASSEMBLIES							
	NEW 5/8" TYPE X GWB (2 LYR ON ONE SIDE) / 1" GWB LINER PANEL (1LYR ON ONE SIDE) ON 2-1/2" C-H METAL STUDS SHAFT WALL, 2HR-RATED	175	SF	$ 14.00	$ 2,450.00	$ 69.00	$ 12,075.00	$ 14,525.00
	EXTEND EXISTING VERTICAL SHAFT TO ABOVE NEW ACT CEILING	1	LOC	$ 1,000.00	$ 1,000.00	$ 3,600.00	$ 3,600.00	$ 4,600.00

CSI Number	Description	Quantity	Unit	Unit Cost Of Material	Total Cost Of Material	Unit Cost Of Labor	Total Cost Of Labor	Total Cost: Materials & Labor
09 51 00	ACOUSTICAL CEILINGS							
	RESTORE EXISTING ACT TILE AND GRID AT AREA OF REMOVED DUCT	36	SF	$ 17.00	$ 612.00	$ 117.00	$ 4,212.00	$ 4,824.00
	IN CELLAR, QTY PER A-201.00							
	OPEN / CLOSE EXISTING ACT CEILING IN CELLAR FOR CONDENSATE	100	SF	$ 12.00	$ 1,200.00	$ 108.00	$ 10,800.00	$ 12,000.00
	LINE							
	NEW 2' X 2' ACT CEILING AND GRID ON EXISTING HANGERS	7,085	SF	$ 8.00	$ 56,680.00	$ 26.00	$ 184,210.00	$ 240,890.00
	CUT-OUTS IN NEW ACT CEILINGS FOR CEILING-MOUNTED FIXTURES	1	LS	$ 240.00	$ 240.00	$ 2,160.00	$ 2,160.00	$ 2,400.00
	AND DEVICES							
09 90 00	PAINTING AND COATING							
	CLEAN WALL AT EXISTING DIFFUSER LOCATIONS	4	LOC	$ -	$ -	$ 300.00	$ 1,200.00	$ 1,200.00
	PREPARE, PRIME AND PAINT ALL GWB CEILING SURFACES	4,757	SF	$ 3.00	$ 14,271.00	$ 16.00	$ 76,112.00	$ 90,383.00
	PREPARE AND PAINT EXISTING WALL SURFACES DUE TO MEPS WORK	3	FLR	$ 80.00	$ 240.00	$ 720.00	$ 2,160.00	$ 2,400.00
	Subtotal FINISHES =							**$ 582,355.00**
10 00 00	**SPECIALTIES**							
10 21 40	STATIONARY METAL BLADE WALL LOUVERS							
	NEW 6" X 6" STATIONARY BLADE LOUVERS W/ GALVANIZED RAIN	2	EA	$ 500.00	$ 1,000.00	$ 1,460.00	$ 2,920.00	$ 3,920.00
	PROTECTION (INCL. SEALANT AND WATERPROOFING)							
	Subtotal SPECIALTIES =							**$ 3,920.00**

BID SUBMISSION FORM

Bidder Name: C.D.E. Air Conditioning Co., Inc.
Procurement Title: 85023B0033-LBC16MPHC Mapleton Branch Library HVAC Replacement (Medium GC PQL)
RFx Name: 85023B0033-LBC16MPHC Mapleton Branch Library HVAC Replacement (Medium GC PQL)

The above-named bidder affirms and declares:

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

Lump Sum Bid Amount (Bid Price Item Grid)	$ 4,667,813.00
+ All Allowances (Allowances Item Grid)	$ 15,000.00
= Total Bid Price: (a/k/a Total Amount)	$ 4,682,813.00

Bidder Signature

EIN (if applicable): 11-2217107
(EIN must match the EIN of the entity that submitted bid information in PASSPort)

Bidder Name: C.D.E. Air Conditioning Co., Inc.

By: Joseph F. Azara
(Name of Partner of Corporate Officer)

Signature: _____
(Signature of Partner of Corporate Officer)

*PLEASE SEE NEXT PAGE FOR CDE's PARTIAL LIST OF COMPLETED PROJECTS.

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)

C.D.E. AIR CONDITIONING CO., INC.
PARTIAL LIST OF COMPLETED PROJECTS

PROJECT NAME AND LOCATION	PROJECT NUMBER	OWNER/CONTACT	TELEPHONE NO.	FINAL CONTRACT PRICE	COMPLETION DATE
Notre Dame Academy A/C for Elementary School & Cottage		Notre Dame Carmine Winters	(347) 552-1504	243,500	September. 2022
LaGuardia Community College Boiler Replacement Project	3152809999	The Fulcrum Group Patrick Quigley/Stephen Kretzmer	(212) 463-0519	6,989,603	August. 2022
PS 11 (Queens) 54-25 Skillman Avenue	C000013556	Citnalta Construction Philip Milo/Lenny Duke	(631) 564-2614 (516) 672-8693	14,597,519	June. 2022
2 Bronx Libraries Replacement of HVAC & BMS	20181425816	NYC DDC Hamid Tavana	((646) 235-3427	1,751,631	June, 2022
Morrisania Library Rooftop HVAC Unit Replacement HVAC Upgrade	20201407086	NYC DDC Kayla Homm	(347) 622-0455	1,629,841	June, 2022
67th Street Branch Library HVAC Roof Replacement	20191403886	NYC DDC Kayla Hom	(718) 391-1265 (646) 879-6572	2,189,511	March, 2022
26th Ward Water Pollution Control Plant 122-66 Flatlands Avenue, Brooklyn NY	20161410771 Contract 26W-20	Skanska-Picone, JV Michael Wright	(516) 403-0915	3,777,432	March, 2022
St. James Recreation Center Reconstruction of Boiler, Heating System & A/C	X044-113MA1 20191407039	NYC Dept. of Parks Frank Fusco	(929) 271-2704 (917) 530-4361	1,650,148	January, 2022
Long Island Baptist Houses Replacement of Boilers & Hot Water Heaters	BL1821015	NYCHA Kelwyn Lyken	(212) 306-4611	4,189,499	September, 2021
Schiff House Daycare Center Renovation	3340909999	Inniss Construction Andy Inniss	(718) 291-8102	1,848,107	September, 2021
4 DHS Site Energy Efficiency Measures	20171416940	NYC DDC Steven Thorne	(646) 617-4227	4,306,863	September, 2020
2 DCAS Sites Energy Conservation Measures	20181403173	NYC DDC Teodor Balan	(718) 391-2488 (917) 890-4373	985,179	June, 2020
Appellate Court House Roof and Operational Spaces Upgrade	20161429673	Neelam Construction Vendant Bhanderi	(201) 768-2213 (201) 835-9339	737,682	May, 2020
Bill Brown Memorial Park Reconstruction of Comfort Station	B109-112M	Northe Group, Inc. Albert Zihenni	(212) 533-6070	313,575	May, 2020
Bowery Bay WTP, Contract BB-64 Main Sewage Pump Upgrades, Control & Piping	20151428773	Picone-Schiavone, JV Mike Boranian	(516) 790-3094 (516) 523-2143	1,240,499	May, 2020
Bronx Family & Criminal Court & Health Building Energy Conservation Measures	20171413981	NYC DDC Muhammad Hussain	(718) 916-5342	7,492,254	May, 2020
Bushwick Green Central Knoll Park Construction of Comfort Station	B395-115MA-1	NESCO Chris Holtz	(718) 361-0044	158,202	May, 2020
2 NYPD Precincts Replacement of Generators	P079GENER 2018/1426587	Commerce Electric James Tamboris	(718) 233-4955	816,928	May, 2020
HS IS 89 HVAC Work	C000014865	Delric Construction Anthony Delacerra/	(973) 427-0058	4,300,000	April, 2020

C.D.E. AIR CONDITIONING CO., INC.
PARTIAL LIST OF COMPLETED PROJECTS

		Robert Ricciardi			
Sorrentino Recreation Center Boilers / HVAC System	Q446-216M 2017142671	NYC Dept. of Parks & Recreation Vladimir Biba	(917) 635-2564 (718) 370—6708	1,523,757	April, 2020
Atlantic Men's Shelter & 67th Precinct Energy Upgrades	20171417117	NYC DDC Carlyle Clinton	(347) 865-0218	2,177,563	December, 2019
FIT Alumni Residence Hall HVAC Chiller Plant Upgrade	C1386	Kallen & Lemelson Sam Baytalsky	(212) 643-9898	2,704,884	December, 2019
Staten Island University Hospital (SIUH) UREA Make Ready	13-1707-18	EW Howell, Co. LLC Hans Laros	(516) 921-7100 (516) 390-8179	383,629	August, 2019
Hunts Point WPCP 1270 Ryawa Avenue, Bronx, NY	HP-237	Spectraserv, Inc. John Kling	(973) 589-0277	22,900	June, 2019
Baruch College HVAC & Controls Upgrade	3048509999	Genesys Engineering, P.C. Charles Klee Christopher Hollister	(914) 633-6490 (631) 974-5171 (914) 712-5840	8,831,090	February, 2019
Staten Island Armory Provide Energy Efficient Retrofit	45441H	Office of General Services (OGS) Tajudeen Alaya, Building CPM	(646) 296-2132	788,621	February, 2019
SUNY College of Optometry 33 West 42nd Street, NY NY	41056-02	State University Construction Fund (SUCF) Simon Stein, RA	(518) 320-3230 (518) 729-6248	5,461,466	February, 2019
Brooklyn Central Library OneNYC Energy Retrofit	20151429177	NYC DDC Rajiv Bhagat	(718) 391-1132 (347) 203-1755	5,914,313	January, 2019
South West Brooklyn Marine Transfer Station 1824 Shore Parkway, Brooklyn NY	20141418737	Prismatic Develop/NYC DDC Mike Pepitione, Prismatic	(973) 882-1133 X266 (973) 776-4680	8,663,567	January, 2019
Christopher Street Substation - PATH Replacement and Upgrade HVAC Work	PAT-624.154	Mass Electric Construction Co. Ricky Kahy	(201) 930-4930	1,088,579	December, 2018
26th Ward Water Pollution Control Plant	Project No. WP-205 Contract 26W-12H	NYC Dept. of Environ. Protection Joanna Heim	(718) 647-6510	12,927,364	December, 2018
SCA Headquarters – Data Center 3030 Thomson Avenue, LIC NY 11101	C000013304	Iannelli Construction Vincent Iannelli	(718) 836-2000	1,224,482	November, 2018
Susan Wagner High School – Black Box Theater	C000013573	Vertex Companies, Inc. Andrew Sargent	(646) 553-3500	4,274,313	November, 2018
PS 195 (Queens) Flood Elimination/Heating Plant Upgrade	C000013531	NYC SCA Muhammad Akbar	(917) 416-2608	6,632,268	October, 2018
PS 360 (Bronx) HVAC Replacement & New Roof	C000013495	NYC SCA Muhammad F. Sharif	(646) 879-1762	3,271,253	September, 2018
Asser Levy Bathhouse Boiler Reconstruction Asser Levy Place, NY NY	M64-213M	NYC Dept. of Parks & Recreation Vladimir Biba	(718) 760-6767 Cell: (646) 879-6572	1,347,730	May, 2018
CUNY Data Center AC-8 Replacement	CITYW-CUCF-01-09-07-GC-1	EPIC Management Dennis Hagerty	(845) 521-1022	381,180.00	March, 2018

C.D.E. AIR CONDITIONING CO., INC.
PARTIAL LIST OF COMPLETED PROJECTS

23rd Precinct Station House Installation of New Cooling Towers	20171406505	NYPD Stephen Sailer	(347) 245-8365	311,301	November, 2017
District 7 Sanitation Garage HVAC System Replacement	20151429101	NYC DDC Jermaine Francis	(718) 391-1342 (347) 401-4987	3,704,688	September, 2017
Governor's Island Facilities Management Building 110	90088	The LiRo Group Nadia Usmani	(516) 434-9721	1,662,254	March, 2017
NYC College of Technology – NYCCT Boiler Plant Repairs	ES-GSN080S	The LiRo Group/Ecosystem Marco Barbosa	(516) 214-8472 (347) 901-0278	1,391,706	January, 2017
Pre-K 66 (Staten Island) 1625 Forest Avenue, Staten Island, NY	C000013711	Arnell Construction Alvin Rodriguez	(718) 852-8500	4,012,000	January, 2017
Bowery Bay WPCP 4301 Berrian Boulevard, Astoria, New York	Project# WP-237 Contract BB-57H	Hazen & Sawyer/NYC DEP Eamon Kelly	(845) 642-4335	28,719,670	June, 2016
Bowery Bay WPCP Anaerobic Digester Gas System Improvements 4301 Berrian Boulevard, Astoria, New York	Project# WP-237 Contract BB-210	Spectraserv – CDM/NYPA John Kling	(973) 589-0277	2,083,679	April 2016
Metropolitan Hospital Center Energy Conservation HVAC Work	ES-GSN-0543	Parson Brinckerhoff Frank Verni, RA	(212) 423-7881 (917) 658-4811	1,605,768	April, 2016
Dapolito Recreation & John Jay Pool Reconstruction of Boilers	MG-113	NYC Dept. of Parks & Recreation Vladimir Biba	(718) 760-6767 Cell: (646) 879-6572	879,676	March, 2016
DEP Digester Gas System Improvement Various Locations – Oakwood Beach, Staten Island 26th Ward & Red Hook, Brooklyn, New York	ES-GSN-0149	Spectraserv –CDM/NYPA John Kling	(973) 589-0277	3,796,308	March, 2016
New York Psychiatric Institute Conversion of 4th Floor to Wet Lab	44220-C	Fratello Construction Steven Cianci	(631) 414-7171	2,392,110	February, 2016
PS 199 (Queens) Annex at St. Teresa 55-15 44th Street, Sunnyside, NY	C000013478	Delric Construction Robert Ricciardi	(973) 427-0058	691,345	February, 2016
United Nations Package 3 – Airside Capital Master Plan	Contract B Package 3	Skanska USA Building Bryan Kobb Sam Alacha Cell:	(917) 367-2246 (917) 444-0573 (212) 963-2477 (646) 208-1552	9,169,198	February, 2016
120 Schermerhorn Street, Brooklyn, NY Boiler Feedwater System Replacement	Project No. C0281BOIL	NYC DDC Rebecca Clough	(718) 391-1127	1,518,657	December, 2015
Manhattan Psychiatric Center Wards Island Manhattan Forensic Relocation Package No. 1	44579	Sea Crest Construction Corp. James Dergin	(516) 868-3000 Cell: (516) 903-6619	347,000	July, 2015
Manhattan Theater Club Renovation at Friedman Theater	PV256-FRI	NYC DDC Charles Lin	(718) 391-1138 (917) 506-0551	790,199	April, 2015
PS 181 (K) 1023 York Avenue, Brooklyn NY	C000013191	Triangle General Contractors Anant Nuraula	(718) 462-2608	19,641	April, 2015

C.D.E. AIR CONDITIONING CO., INC.
PARTIAL LIST OF COMPLETED PROJECTS

Kingsbridge Heights Community Center Construction of HVAC System	Contract No. X250-109MA1	NYC Dept. of Parks & Recreation Fred Hammerling	(718) 760-6643	880,721.00	January, 2015
Manhattan Pumping Station Newtown Creek WPCP	Project # WP-283 Contract NC-40H	Hazen & Sawyer/NYC DEP Alex Klar, P.E.	(718) 609-8701	12,623,793	January, 2015
Queens Children's Library Children's Library Discovery Center	20040018658	Hill International/NYC DDC Marc Zaretsky, Vice President	(212) 244-3700	7,979,398	December, 2014
United Nations South Screening Building		Skanska USA Building Raki Lavon	(917) 346-3739	76,588	December, 2014
Queens College Science Building HVAC Work	CITY-W-CUCF-01-09-04-MECH	STV/CUNY Jeanny Cheung,	(212) 614-3382	478,898	November, 2014
102 Precinct Station House New Air Cooled Chiller	CT 1 056 20131420928	NYPD Stephen Sailer	(718) 476-8699 (347) 245-8365	638,138	October, 2014
Newtown Creek WPCP, NC-36H 329 Greenpoint Ave., Brooklyn, NY 11222	Project WP-283 Contract NC-36H	Hazen & Sawyer/NYC DEP Stan DiMaris	(646) 739-3709	12,428,503	September, 2014
Parks District Headquarters Bushwick Inlet Park Kent Avenue, Between N. 9th Street, Brooklyn, NY	BG-38250-507M	NYC Dept. of Parks Matthias Augustin Lorenzo Calabrese	(718) 760-6828 (718) 760-6866	2,278,477	September, 2014
Tavern of the Green Core and Shell Renovation Contract No. 1 – General Construction Work	Contract TAVREH	NYC DDC Michael Nastasi	(718) 391-1174	3,473,822	August, 2014
Central Park Police Precinct 86th Street Transverse Road, New York NY	20060007059	AECOM – NY / NYC DDC Douglas Kerrigan	(646) 963-6011	4,268,423	July, 2014
Pier 40 HVAC Restoration	LC4548	LiRo Program & Construction Mark Conti	(516) 938-5476	331,279	January, 2014
Paerdegat Basin Water Quality Facility 1887 Ralph Avenue, Brooklyn, New York	WP-169 Contract # CSO-5H	Hazen & Sawyer, P.C. Pietro L. Palmari, P.E.	(718) 241-2053	21,828,306	September, 2013
71st Precinct Station House Replacement of Existing Boiler & Associated Accessories	20121419085	NYPD - Bldg. Maintenance Stephen Sailer, APM III Cell:	(718) 476-8699 (347) 245-8365	383,323	August, 2013
Hunter College City University of New York Chiller Replacement of A/C Upgrades	CITY-CUCF-01-09-02-GC3	EPIC Management/CUNY Vincent Ramadani	(212) 601-2766	1,375,398	April, 2013
Newtown Creek WPCP, NC-31H 329 Greenpoint Avenue, Brooklyn, NY	Project No. WP-283 Contract NC-31H	Malcolm Pirnie/NYC DEP Stan Damaris	(646) 739-3709	16,426,796	May, 2013

*PLEASE SEE NEXT PAGE FOR CDE's LIST OF PROJECTS IN PROGRESS.

B. Contracts currently under construction by the bidder

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

Project & Location	Contract Type	Contract Amount ($000)	Subcontracted to Others ($000)	Uncompleted Portion ($000)	Date Scheduled to Complete	Owner Reference & Tel. No.	Architect/ Engineer Reference & Tel. No. (if different from owner)

C.D.E. AIR CONDITIONING CO., INC.
CONTRACTS IN PROGRESS DECEMBER 31, 2022

PROJECT NAME AND LOCATION	PROJECT NUMBER	CONTACT /OWNER	TEL. NO.	CONTRACT PRICE INCL C.O.'S	PERCENT COMPLETE	BILLED TO DATE
Addabbo Family Health Center	3314409999 DA# 221327	DASNY Mark Igel	(718) 254-8293 (516) 641-2781	2,480,700	1	0
Animal Care & Control Center Reconstruction Staten Island, NY	20141408086	Minelli Construction Joanne DePalma/John Gertonson Blaine Belgrave, NYC DDC	 (631) 232-0222 (718) 391-1377	800,197	*	99
Broadway Library Interior Renovation HVAC Work	20228804715 LQD122BR2	XBR Inc. Sean Bronson	(718) 606-0072	574,422	61	47
Brooklyn College West Quad Building Pool Chemical Storage - HVAC Work	3575409999/CR8 DA# 219394	DASNY Robert Thelian	(718) 421-2621	599,668	80	72
Cumberland Hospital Cooling Tower Replacement	16-2022-037 27202101	NYC HHC Aminul Haque	(646) 694-5745	948,104	39	48
Eastchester Library HVAC Replacement	20191429056	NYC Dept. of Design & Construction Hamid Tavana Kayla Hom	 (718) 391-1265 (347) 622-0455	1,272,824	*	98
Flushing Library Chiller Replacement	PO 668748	Nick Cianciotti, Cameron Engineering	(631) 926-4124	4,391,799	8	11
Fresh Meadows Library Roof, HVAC & Ceiling Renovation	667137	Queens Public Library William Funk	(718) 990-0872	1,518,048	*	78
Gansevoort Penninsula Building Mechanical Construction	C5320	Corey H. Bedford, Gilbane Tom Adams, Hudson River	(718) 490-0877	494,068	22	6
Hillcrest Library Roof Replacement & HVAC Upgrade	20238802409 LQHIROOF	NYC Dept. of Design & Construction Pilar Ramirez	(718) 391-2647 (917) 943-7863	1,842,467	2	4
Hostos Community College Subcellar	3430109999 CR2	Constructomics Gabriel Mirkov	(212) 337-2300	1,692,390	*	99
Hunter College Campus School HVAC Upgrade	31574009999	Genesys Engineering, PC Gregg Matthews Christopher Hollister	(914) 633-6490 (914) 336-7883 (914) 712-5840	12,172,289	*	99
Hunts Point Library Renovation - Carnegie NYPL HVAC Work	J08568.120-0012-000	Gilbane Building Company Camille Rimmer	(212) 312-1600 917-890-6941	2,011,178	13	13
Jacobi Hospital, 4th Floor Auditorium HVAC Upgrades	21202104	Jacobs Engineering David Fox, P.E.	(917) 892-8374	596,905	35	38
Jamaica WWTP Reconstruction of Existing Chiller System	20201417478 J-191	Hazen & Sawyer Pietro Palmari, P.E.	(347) 312-3956 (347) 452-5216	1,736,037	33	24

* Denotes project substantially complete

C.D.E. AIR CONDITIONING CO., INC.
CONTRACTS IN PROGRESS DECEMBER 31, 2022

PROJECT NAME AND LOCATION	PROJECT NUMBER	CONTACT /OWNER	TEL. NO.	CONTRACT PRICE INCL C.O.'S	PERCENT COMPLETE	BILLED TO DATE
Laurelton Library HVAC Work	PO 669479	Nick Cianciotti, Cameron Engineering John Katimaris, QPL	(631) 926-4124 (718) 480 4260	1,045,726	1	0
Melrose Library Renovation - Carnegie NYPL HVAC Work	J08568.110-011-000	Gilbane Building Company Christian Calle	(212) 312-1600 (929)431-0313	1,827,000	26	17
Midtown North Precinct Replacement/Upgrade of HVAC	20238805087	NYPD Amr Eldion	(646) 610-5123 Cell: (917) 355-6316	1,513,075	1	0
Mott Haven Library HVAC Upgrade	20191429341	NYC Dept. of Design & Construction Kayla Hom/Hamid Tavana	(718) 391-1265 (646) 235-3427	2,112,593	*	94
Muhlenberg Library HVAC & Elevator Upgrade	20228804045 LNCA14MBG	NYC Dept. of Design & Construction Todd Alexander	(347) 404-0252	2,604,427	35	44
New York Aquarium Restoration HVAC	BP-27 HVAC	Turner Construction Co. Jeff Mattson Ron Speicher, Mechanical PM	(203) 209-9040 (646) 721-2013 (646) 721-2013	6,600,678	*	99
New York Hall of Science Chiller Replacement & BMS Upgrade	20211407831	NYC Dept. of Design & Construction Charles Lin	(917) 731-6801	2,619,481	*	98
NYPD 68th & 76th Precincts Boiler Replacements	20238803882	NYPD Amr Eldion	(646) 610-5123 Cell: (917) 355-6316	2,104,541	1	0
North River WWTP Contract NR-38 Cogeneration and Electrification	20171426056	Yonkers Contracting John Merolla	(914) 665-1500 (646) 374-0133	2,062,614	*	98
Queens 7 District Garage Renovation HVAC Work	S136-438 8502019VP0007C	Delric Construction Anthony Delacerra/Robert Ricciardi	(973) 427-0058	149,391	*	96
Queens College Razran Hall HVAC Upgrade & Asbestos Abatement	3066809999	Genesys Engineering, PC Charles Klee/Gina Tomero	(631) 974-5171	16,996,429	21	26
Rikers Island - OBCC Dishwashing Machines & Related Eqpt. - HVAC	072201748CPD	Commerce Electric James Tomboris	(718) 233-4955	303,770	*	99
Staten Island University Hospital (SIUH) North Campus	13-1725-05	EW Howell Co., LLC Hans Laros	(516) 921-7100 (516) 390-8179	15,131,461	88	99
Staten Island University Hospital (SIUH) Overbuild	13-18-16	EW Howell Co., LLC Hans Laros	(516) 921-7100 (516) 390-8179	11,482,357	99	99
The Scholars Academy IS 323 320 Beach 104th Street, Rockaway Park, NY	C000013533	NYC SCA Reinaldo Rosales	(718) 472-8237 (917) 418-3510	17,267,432	*	99
Von King Park Cultural Arts Center Reconstruction of Multipurpose Room	B088-111MA	D&S Restoration Dusko Joldzic	(973) 345-8020	1,248,453	*	99
West 79th Street Bridge Rotunda - Rehab. HVAC Work	4003-CDEA01	Judlau Ed White	(718) 554-2300	2,030,000	4	0

* Denotes project substantially complete

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)
St. James Recreation Center - Reconstruction	HVAC Prime	$1,196,183.00	4/23	NYC Parks Charlene Dawson 718-760-6553	
Carroll Gardens Branch Library - HVAC Replacement	HVAC Prime	$4,996,351.00	4/23	NYC DDC Sergio Vasquez 718-391-1364	Loring Engineers Jorge Piñas 212-563-7400
SI Childrens Museum - HVAC Upgrade	HVAC Prime	$5,362,043.00	4/23	NYC DDC Woon Lam 718-391-1364	Goldman Copeland Associates, PC 212-868-4660
Hunter College Kaye Playhouse Rooftop AHU Replacement and Asbestos Abatement	HVAC Prime	$3,699,084.00	TBD	DASNY Dominic Donadio 518-257-3596	Lizardo's Engeering Andrew Dubel 212-967-7651 X 354
115th Precinct - HVAC Replacement	HVAC Prime	$1,985,943.00	TBD	NYPD Jordan Glickstein 718-610-8623	
Queensboro Hill Library HVAC Upgrade	HVAC Prime	$1,995,233.00	TBD	NYC DDC Chinwee Summors 718-391-1004	RKTB Architects, P.C. 212-807-9500

Commercial
Domestic
Electric

C.D.E. Air Conditioning Co., Inc.
ESTABLISHED 1930

321 - 39th Street
Brooklyn, NY 11232

Phone: (718) 788-1040
Fax: (718) 788-2046
www.cdeair.com

March 29, 2023

Ms. Anika Barrington, ***Contract Manager***
NYC Department of Design and Construction
30-30 Thomson Ave.
Long Island City, NY 11101

Re: Pre-Award Process for Mapleton Branch Library – HVAC Replacement, LBC16MPHC : Project Specific Information

Ms. Barrington,

This letter is to address all Project Specific Information required from the "Pre-Award Process" Letter sent to us on 03/22/2023, it will include all attachments required respectively.

1. C.D.E. Air Conditioning was established in 1930 by Joseph F. Azara. Joseph F. Azara, Jr. has been the President since 1979. He has worked for C.D.E. since 1967. He is a past President of the New York Chapter of the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE). He is presently on the Board of Directors of the Subcontractors Trade Association (STA) and Chairman of the Public Agencies Committee. Mitchell I. Merdinger, our Vice President is also a past President of the New York Chapter of ASHRAE. Brian J. Azara, our Corporate Secretary, joined C.D.E. in 2005 after working for an HVAC design firm and is a third generation Azara in the HVAC industry. Our staff includes eleven (11) Mechanical Engineers. All have vast experience in all phases of HVAC Contracting. Our bonding company is Liberty Mutual Insurance Co., with a surety program of $100,000,000.00 single and an aggregate of $200,000,000.00 (Attached is our bonding capacity letter). To provide you with additional introductory information on C.D.E. Air Conditioning Co., please visit our website www.cdeair.com.

2. Please see attachments for resumes for all key personnel to be involved in the project.

3. It is too early to determine a list of significant pieces of equipment's expected to be used.

4. Please see attachments for work expected to be subcontracted.

5. It is too early to determine a list of key material suppliers.

6. Please see attachments for the Preliminary Bar Chart Time Schedule.

7. CDE will self-finance this project.

8. CDE does not foresee any issues impacting on our ability to perform the work according to the contract.

Respectfully,

Joseph F. Azara
President

ATTACHMENTS

BONDING CAPACITY LETTER

Liberty Mutual Insurance Company
One Battery Park Plaza, 30th Floor
New York, NY 10004

April 7, 2022

Re: **C.D.E. AIR CONDITIONING CO., INC.**
BONDING CAPACITY

To Whom It May Concern:

We, American Global, LLC and Liberty Mutual Insurance Company, hereby confirm that C.D.E. Air Conditioning Co., Inc. ("Contractor"), is a highly valued client of Liberty Mutual Insurance Company. We hereby confirm that the "Contractor" has a surety program of $100,000,000.00 single / $200,000,000.00 aggregate. We estimate the current available bonding capacity is $100,000,000.00.

Please be advised that all requests for performance and payment bonds are subject to the review and acceptance of the terms and conditions of the contract by the Surety Company and satisfactory evidence of financing for the job, and the normal underwriting review by the surety at the time of the request of the bonds.

This letter merely renders an opinion and does not constitute a bid bond or consent of surety. We assume no liability to you or to third parties if for any reason the "Contractor's" Surety Company declines to issue the bond.

Please feel free to call me at 516.231.4267 with any questions. By this letter, our client has authorized us to respond to any questions that you may have.

Liberty Mutual Insurance Company

By: _____
Krystal L. Stravato, Attorney-In-Fact

ACKNOWLEDGEMENT OF SURETY COMPANY

STATE OF New Jersey

COUNTY OF Morris

ON THE 7th DAY OF April, 2022 BEFORE ME PERSONALLY APPEARED Krystal L. Stravato TO ME KNOWN, WHO BEING BY ME DULY SWORN, DID DEPOSE AND SAY; THAT (S)HE IS THE ATTORNEY-IN-FACT OF Liberty Mutual Insurance Company, THE CORPORATION THAT EXECUTED THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED TO ME THAT SUCH CORPORATION EXECUTED THE SAME.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIXED MY OFFICIAL SEAL, AT MY OFFICE IN THE ABOVE COUNTY, THE DAY AND YEAR WRITTEN ABOVE.

Notary Public

William A. Drayton Jr.
Notary Public
State of New Jersey
My commission expires April 9, 2026

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

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

Certificate No: **8207609-985316**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Edward Reilly; Jaclyn Thomas; Kevin T. Walsh, Jr.; Krystal L. Stravato; Marisol Mojica; Michael Marino; Thomas MacDonald

all of the city of Whippany state of NJ each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, including but not limited to consents of surety for the release of retained percentages and/or final estimates on construction contracts or similar authority requested by the Department of Transportation, State of Florida, and the execution of such undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 7th day of April, 2022.

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

By: _____
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 7th day of April, 2022 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

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

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

By: _____
Teresa Pastella, Notary Public

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

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts: Section 5. Surety Bonds and Undertakings.
Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

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

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

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

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 7th day of April, 2022.

By: _____
Renee C. Llewellyn, Assistant Secretary

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

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

LIBERTY MUTUAL INSURANCE COMPANY

FINANCIAL STATEMENT — DECEMBER 31, 2020

Assets

Cash and Bank Deposits	$2,058,007,542
*Bonds — U.S Government	2,209,760,437
*Other Bonds	15,902,755,586
*Stocks	18,517,107,230
Real Estate	193,169,809
Agents' Balances or Uncollected Premiums	6,970,170,469
Accrued Interest and Rents	118,399,147
Other Admitted Assets	12,079,597,645
Total Admitted Assets	**$58,048,967,865**

Liabilities

Unearned Premiums		$8,448,706,991
Reserve for Claims and Claims Expense		23,879,216,613
Funds Held Under Reinsurance Treaties		343,068,613
Reserve for Dividends to Policyholders		1,192,716
Additional Statutory Reserve		77,397,000
Reserve for Commissions, Taxes and Other Liabilities		6,279,510,804
Total		**$39,029,092,737**
Special Surplus Funds	$178,155,102	
Capital Stock	10,000,075	
Paid in Surplus	10,945,045,214	
Unassigned Surplus	7,886,674,737	
Surplus to Policyholders		**19,019,875,128**
Total Liabilities and Surplus		**$58,048,967,865**

LIBERTY MUTUAL INSURANCE COMPANY INCORPORATED 1912 MASSACHUSETTS

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

I, TIM MIKOLAJEWSKI, Assistant Secretary of Liberty Mutual Insurance Company, do hereby certify that the foregoing is a true, and correct statement of the Assets and Liabilities of said Corporation, as of December 31, 2020, to the best of my knowledge and belief.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Corporation at Seattle, Washington, this 25th day of March, 2021.

T A Mikolajewski

Assistant Secretary

RESUMES FOR ALL KEY PERSONNEL

JOSEPH F. AZARA, JR.
215 Howard Avenue
Staten Island, New York 10301
Home: (718) 273-7870
Cell: (917) 682-7114

EXPERIENCE:

C.D.E. Air Conditioning Co., Inc. **Brooklyn, New York**
President January 1971 to Present
Chief Executive Officer and Chief Financial Officer actively involved with all phases of the H.V.A.C. & R industry. Commenced working with for C.D.E. in January of 1971 as Vice President in charge of Engineering. Elected to the position of President in January 1979. Guided C.D.E. from one million dollar a year Air Conditioning Contractor to its present position as a twenty million dollar a year Mechanical Contractor. C.D.E. has completed projects of increasing magnitude and technical sophistication for public agencies, construction managers and private clients.

Pratt and Whitney Aircraft **East Hartford, Connecticut**
Experimental Test Engineer June 1967 to May 1969
Responsible for building and testing compressor sections of jet engines. Worked on the development of state of the art engines for the F-111 military and 747 commercial planes. Responsibilities included writing the Final Test Report which was presented to the Corporate Officers.

EDUCATION:

New York Institute of Technology
New York, New York September 1967 to May 1969
B.S. Mechanical Engineering – Applied Thermodynamics Degree

Stevens Institute of Technology
Hoboken, New Jersey September 1965 to May 1967
Pursuing a degree of B.S. Mechanical Engineering

PROFFESSIONAL MEMBERSHIPS

American Society of Heating, Refrigeration & Air Conditioning Engineers (A.S.H.R.A.E.)
Past President of the New York Chapter
March 1972 to Present

NYC Technical College, Brooklyn, New York
Member of Advisory Board for Mechanical Technology Department

Subcontractors Trade Association (STA) Board of Directors as a member serves as Chairman of the Public Agency Committee and is Vice Chairman of the Safety Group Executive Committee

MITCHELL MERDINGER

475 East Chester Street
Long Beach, New York 11561
Home (516) 889-6564
Office (718) 788-1040
Email: mitchellm@cdeair.com

EXPERIENCE:

C.D.E. Air Conditioning Co., Inc. — **Brooklyn, New York**
Vice President — 12/87 to Present

- Supervise all project managers and superintendents in the completion of various large HVAC projects.
- Responsible for estimating multi-million dollar projects for public and private agencies.

Technical Career Institute — **New York, New York**
Part-Time Instructor — 01/85 to 01/88

- Taught computers, drafting and HVAC courses.
- Responsible for course preparation.

H. Sand & Co. — **Westbury, New York**
Project Manager — 01/83 to 12/87

- Managed multi-million dollar fast track public and private projects to completion.
- Assisted in estimating, purchasing and contracting departments.

EDUCATION:

State University of New York — **Stony Brook, New York**
B.S. Mechanical Engineering — December 1982

State University of New York — **Morrisville, New York**
A. A. Liberal Arts — June 1979

PROFESSIONAL MEMBERSHIP:

American Society of Heating, Refrigeration & Air Conditioning Engineers (A.S.H.R.A.E.)
Past President of the New York Chapter of ASHRAE

MITCHELL MERDINGER

PARTIAL LIST OF PROJECTS MANAGED:

WP-287 Coney Island WPCP 20H
Contact: John Barulich -
Hazen & Sawyer/MPI
(718) 609-8705
Contract Value: $18,131,864

Brooklyn Battery Tunnel BB-06
Contact: Earl Walcott - TBTA
(718) 797-6927
Contract Value: $13,298,402

Newtown Creek WPCP Contact 32H
Contact: Robert Lindaberry -
Greeley & Hansen
(212) 227-1229
Contract Value: $10,994,200

Huntspoint WPCP Contract 53H
Contact: Thomas Farrell - NYC DEP
(212) 378-3885
Contract Value: $4,871,269

FDNY Dispatch Operations
Contact: Patrick Maher -O'Brien Kreitzberg
(718) 441-4597
Contract Value: $4,357,659

Police Headquarters
Contact: Mark Lavides - NYC DDC
(212) 608-0025
Contract Value: $4,266,528

Coney Island WPCP Contract 8H
Contact: John Barulich -
Hazen & Sawyer/MPI
(718) 609-8705
Contract Value: $4,189,354

Jamaica WPCP Contract 56H
Contact: John Most - NYC DEP
(718) 244-1559
Contract Value: $3,830,504

Riker's Island GMDC Kitchen
Contact: Lawrence Large - URS Corp.
(718) 278-7654
Contract Value: $3,280,369

FDNY Training Center
Contact: Nick Argiro - Liro
(212) 876-8220
Contract Value: $3,400,881

Far Rockaway High School
Contact: Ken Faustmann NYC SCA
(718) 472-8293
Contract Value: $1,453,582

BRIAN J. AZARA

251 7TH STREET, APT. 8D, BROOKLYN, NEW YORK 11215
HOME: (718) 522-6164 • MOBILE: (646) 210-6372
E-MAIL: BRIANA@CDEAIR.COM

EDUCATION:

Lafayette College — **Easton, PA**
B/S Mechanical Engineering — 1999-2003

Poly Prep C.D.S. — **Brooklyn, NY**
College Prep — 1995-1999

EXPERIENCE:

C.D.E. Air Conditioning Co., Inc. — **Brooklyn, NY**
Corporate Secretary — May 2005 - Present
Involved in bid preparation, purchasing, project management, engineering and corporate IT.

AKF Engineers LLC — **New York, NY**
Design Engineer — June 2003 – May 2005
Calculated heating and cooling loads for building systems. Surveyed exisitng mechnaical systems for buildings. Designed air distribution and mechanial systems. Selected and laid out mechanical equipment such as pumps, chillers, fans and boilers. Prepared calculations, drawings and specifications. Served as project manager for projects. Attended meetings with Architects, Owners and building managers to discuss future and or current projects and problems.

C.D.E. Air Conditioning Co., Inc. — **Brooklyn, NY**
Engineer in Training — June - August 2002; June - August 2001
June - August 2000; June - August 1999
Revised record drawings and created new drawings using AutoCAD and manual drafting. Created Operation and Maintenance Manuals. Created and revised CPM schedulese using Primavera. Installed and administered a computer network. Reviewed equipment submissions prior to submission to consulting engineer and contacted vendors to resolve inconsistencies with the specificaitons. Assited Chief Estimator in the preperation of bids.

C.D.E. Air Conditioning Co., Inc. — **Brooklyn, NY**
Technician's Assistant — June - August 1998; June – August 1997
Assisted technicians in the installation and service of HVAC equipment.

COMPUTER SKILLS:

Microsoft Word, Microsoft PowerPoint, Microsoft Excel, AutoCAD R14-2005, ANSYS, MathCAD, Mathematica, Sure Trak, Primavera, Microsoft Project

PROFESSIONAL MEMBERSHIPS

American Society of Heating Refrigerating and Air Conditioning Engineers

SAFETY TRAINING/CERTIFICATIONS:

10-Hour OSHA Training Course in Construction Safety & Health
7-Hour Course for Site Safety Managers
Safety Awareness Training – Confined Space
GPRO Certification

BRUCE BARLAND

1515 Oriental Boulevard
Brooklyn, New York 11235
(718) 975-2082

EXPERIENCE:

Obtained numerous years of experience in various types of construction including commercial, industrial and institutional as a Construction/Project Manager in the HVAC industry. Extensive experience and responsibility for all phases of projects from time of award to successful completion with heavy emphasis on client relationships, scheduling, coordination between primary contractor and subcontractors, purchasing, payments to subcontractors, reviewing, approval and delivery of equipment, initialing/processing change orders.

C.D.E. Air Conditioning Co., Inc. **Brooklyn, New York**
Project Engineer 07/94 to Present

- Responsible for computerized and technical support of multi-million dollar city projects for: DEP, HHC, DDC, SCA, NYPD, DPR, DOC and other agencies.
- Organize and manage all trades working under C.D.E.'s supervision.
- Coordinate schedules and projects with other Contractors and Subcontractors.
- Supervise HVAC projects.
- Act as liaison between owners and owners' representatives.

Noll Mechanical Corp. **Woodside, New York**
Estimator/Manager 01/93 to 6/94

- Responsible for complete project management, including bid preparation, purchasing of equipment and job management.
- Cost estimating for various kinds of HVAC work on public works and private projects using computer estimating programs.
- Design of HVAC systems, as-built drawings and shop drawings using Auto Cad r. 12.

Ilan Mechanical Inc. of New York
Estimator 01/89 – 01/93

- Responsible for bid preparation based on quantity take-off material and equipment, market analysis for material and labor.
- Cost estimating for construction, demolition and alteration of all types of HVAC work.
- Prepare calculations on programmable calculator or computer using estimating programs.
- Design of HVAC systems, duct and piping layout.

Construction Co. of Noyabrsk **USSR**
Estimator/Manager 09/84 – 10/88

- Take-off drawings, cost estimating, detailed calculation of materials and labor required.
- Expertise and control of blue prints regarding field conditions.
- Involved in HVAC, plumbing and sprinkler work for industrial and residential projects.
- Permanent quality and quantity control.

EDUCATION:

Queensborough Community College — **Queens, New York**
Computer Aided Design & Drafting Certificate — 07/91 – 03/92

Institute of Railroad Engineering — **Leningrad, USSR**
BS in Civil Engineering — 09/79 – 07/84

Technical College of Construction — **Chernovtsy, USSR**
AS in Construction Engineering — 09/75 – 07/79

SAFETY TRAINING

7-Hour Site Safety Manager
10-Hour OSHA Training Course in Construction Safety & Health
30-Hour OSHA Training Course in Construction Safety & Health
Safety Awareness Training – Confined Space
NYC Department of Housing Preservation and Development Local Law Compliance Training Owner
NYC Buildings Construction Superintendent

BRUCE BARLAND

PROJECTS MANAGED:

- FDNY EMS-27
- FDNY Radio Repair Shop
- FDNY Dispatch Queens
- Tavern on the Green
- 102nd Police Precinct
- Hunter College Chiller
- Kingsbridge Community Center
- Mitchell Field Marine Store
- HHC Metropolitan Hospital Center
- Manhattan Psych Center – Wards Island
- PS 199 Contract 13478
- SouthWest Brooklyn Marine Transfer Station S216-399A
- Kings County Hospital Isolation Ward A42
- Staten Island Zoo
- Snug Harbor Music Hall
- Queens House of Detention for Men
- Rikers Island AMKC Kitchen and Services
- Rikers Island GMDC Kitchen and Remote Feeding
- Grand Central Terminal
- City Island and Marble Hill Pumping Station
- Rikers Island JATC 2A and 4B
- Covenant House Chiller Replacement
- Rikers Island GMDC Central Storage
- Bill Brown Memorial Park
- Covenant House Chiller Replacement
- Rockaway Water Pollution Control Plant Contract No. R-91
- Fort Washington Adult Day Care Center
- Ocean Bay Apartments Community Center
- Betances Houses IV & VI Community Center
- Flight 587 Memorial
- Jacob Riis Settlement House
- Spring Creek AWPCP – Upgrade HVAC
- Rikers Island RMSC – 800 Bed Addition
- Paerdegat Basin Water Quality Facility Contract CSO-5H
- S136-383Q District 7 Sanitation Garage – HVAC System Replacement
- E12-0023 Brooklyn Central Library – OneNYC Energy Retrofit
- Manhattan Appellate Courthouse – Roof and Operational Spaces Upgrade
- Atlantic Men's Shelter & 67th Precinct, Brooklyn Contract E14-0001
- NY Aquarium Restoration –
- 2 NYPD Precincts
- Rikers Island OBCC
- DSNY Queens 7 Garage
- LaGuardia Community College – Boiler Replacement
- Von King Park Cultural Arts Center – Reconstruction of Multi-Purpose Room
- Gansevoort Peninsula – Building Mechanical Construction
- West 79th Street Bridge Rotunda

Rudman J. Romain

(646) 345-2373

Possess experience in various types of construction with various agencies such as NYC School Construction Authority, NYC Department of Parks and Recreation, NYC Department of Environmental Protection and Port Authority of NY and NJ as an Assistant Project Manager, Project Manager, Estimator and Closeout Manager. Extensive experience and responsibility for all phases of projects from time of bid award to successful completion with heavy emphasis on client relationships, scheduling, coordination between primary contractor and subcontractors and prepare close out documents for completion turn over.

Experience

C.D.E. Air Conditioning Co., Inc. **Brooklyn, New York**
Project Manager
05/2019

- Responsible for computerized and technical support of multi-million dollar city projects
- Organize and manage all trades working under C.D.E.'s supervision.
- Coordinate schedules and projects with other Contractors and Subcontractors.
- Act as liaison between owners and owners' representatives.
- Review and process project submittals / shop drawings prior to submission to consulting engineer
- Coordinate and draft As-Built/ Record Drawings for project closeout
- Attend meetings
- Officiate Safety meeting and appropriate safety attire

CPN Mechanical, Inc. **Astoria, New York**
Project Manager
09/2017 to 05/2019

- Read and interpret Architectural/Engineering drawings
- Assign and supervise manpower daily and weekly work task
- Track installation progress
- Coordinate installations with client's **PM** and Supers
- Attend project design, progress and coordination meetings
- Prepare monthly payment requisitions
- Coordinate with material vendors and subcontractors

ACS System Associates **Mount Vernon, New York**
Senior HVAC Estimator/Close Out Manager
05/2010 to 09/2017

- Read and interpret Architectural/Engineering drawings
- Create cost estimate in a timely manner to meet deadlines
- Identify and quantify cost factors, such as production time, materials and labor expenses
- Distribute Bid documents to Subcontractors for quotes
- Prepare bid proposal, including cost breakdown, clarifications, scope and exclusions

MES, Inc. Picatinny Aresenal, **NJ.**
Assistant Project Manager (US Army Base)
05/2004 - 04/2010

- Read and analyzed Architectural/Engineering drawings
- Performed constructability review of plans and specifications
- Executed visual quality control assessments of work quality and materials
- Provided construction progress reports by collecting, analyzing, and summarizing construction and budget data and trends
- Supervised staff and safety management

Construction Laborer
05/2003 to 05/2004

- Cleaned and prepared construction sites to eliminate hazards
- Positioned, joined, aligned, sealed structural components, such as concrete wall sections and foundations.
- Measured, marked and recorded openings and distances to lay out areas for construction work.
- Read and interpreted plans, instructions and specifications to determine work activities.
- Performed demolition and excavation.

Education

Borough of Manhattan Community College Manhattan, New York
2009
Cost Estimating
U.S. Army Corps. Of Engi.neers
2006
Construction Quality Management for Contractors
City College of New York
2005
Construction Management Port-au-Prince, Haiti
University Quisqueya D'Haiti
1998 to 2000
Architectural Studies

Safety Training

10- Hour OSHA Training Course in Construction Safety & Health
4-Hour User Supported Scaffold
Licensed NYC Construction Superintendent
62 HR Site Safety Training – SST Supervisor
ASHRAE Member

Rudman J. Romain

PARTIAL LIST OF PROJECTS MANAGED & ESTIMATED/CLOSEUT:

Managed ProjectManager	**Contract Value**
Bryant Park South	$11,000,000.00
ERDLF	$6,000,000.00
HEPFF	$7,000,000.00
PYRO	$3,000,000.00
Eastchester Library	$1,132,266.00
Morrisania Library	$1,560,932.00
Muhlenberg Library	$2,600,214.00
Melrose Library	$1,800,000.00
Hunts Point Library	$1,910,317.00
Estimator & Close-Out Manager	
PS48R	$4,700,000
PS50R	$6,000,000
59th Street Recreation Center	$1,700,000
Pier A Phase III	$4,900,000
Waldorf Astoria	$2,300,000
JFK	$4,300,000
Hostos Community College	$500,000
Eger Healthcare SI	$1,000,000
Dock 72 Brooklyn	$850,000
Metro North- Harmon Station	$700,000
Zara Palisades	$$1,000,000
28 Liberty	$1,200,000
388-390 Greenwich	$8,000,000

Claude M. Gilchrist

127-08 172nd Street
Jamaica, NY 11434
(347) 554-1002

Possesses experience in various types of construction with various agencies such as NYC School Construction Authority, NYC Department of Parks and Recreation, NYC Department of Environmental Protection and NYC Department of Design and Construction. Extensive experience and responsibility for all phases of projects from time of bid award to successful completion with emphasis on client relationships, scheduling, coordination between primary contractor and subcontractors and preparation of close out documents for turnover.

Experience

C.D.E. Air Conditioning Co., Inc. Brooklyn, New York
Project Engineer
08/2018 to Present

- Review contract documents and drawings prior to starting project
- Coordinate with Owner and subs at project kickoff
- Create schedules
- Conduct meetings with project inspectors and owner representatives from initial to close out stage
- Communicate daily with management to provide progress and update of projects
- Daily planning and coordination of trades
- Record and maintain daily logs
- Officiate safety meeting and monitor appropriate safety attire
- Coordinate and manage all work on-site
- Review and process job Submittals / Shop drawings
- Enforce OSHA compliance and DOB regulations
- Maintain DOB & DOT permits at jobsite
- Cost tracking throughout the duration of the project also provide schedule of values for periodic requisitions to Owner
- Review and approve invoices for subcontractors and vendors
- Review, prepare and negotiate Change Orders and maintain Change Order Logs
- Organize and provide equipment/system training to Owner/Facility if needed
- Project Closeout

C.D.E. Air Conditioning Co., Inc. Brooklyn, New York
Assistant Project Engineer
11/2010 to 07/2018

- Responsible for computerized and technical support of multimillion-dollar city projects
- Organize and manage all trades working under C.D.E.'s supervision.
- Coordinate schedules and projects with other Contractors and Subcontractors.
- Act as liaison between owners and owners' representatives.
- Review and process project submittals / shop drawings prior to submission to consulting engineer
- Coordinate and draft As-Built / Record Drawings for project closeout
- Attend meetings
- Officiate Safety meeting and appropriate safety attire

Education

New York City College of Technology — Brooklyn, New York
08/2007 to 06/2011
Major Construction Management
Associates in Applied Science Construction Technology Dec. 2009
Bachelor's Degree, Facilities Management focus in Construction Management

Kingsborough Community College — Brooklyn, New York
02/2004 to 06/2006
Associates in Applied Science Accounting

Safety Training/Certification

10-Hour OSHA Training Course in Construction Safety & Health
40-Hour OSHA Training Course in Construction Site Safety Training Supervisor
ACI Certification Concrete Field Testing Technician
FDNY Certificate of Fitness for Construction Site Fire Safety Manager
NYC DOB Construction Superintendent

Claude M. Gilchrist

PARTIAL LIST OF PROJECTS MANAGED:

- PS 195 (Queens) Contract 13531
- PS 360 (Bronx) Contract 13495
- Scholars Academy IS 323 Contract 13533
- SCA Data Center Contract 13304
- 26th Ward Water Pollution Control Plant
- Baruch College Contract 3048509999
- SUNY College of Optometry 41056-02
- Broadway Library
- Baruch College – HVAC & Controls Upgrade
- Hunter College Campus School HVAC Upgrade
- LaGuardia Community College
- NY Aquarium Restoration – HVAC Work
- Queens College
- Governor's Island
- Von King Park Cultural Arts Center
- 102 Precinct Station House
- 4 DHS Site – Energy Efficiency Measures
- Long Island Baptist Houses – Replacement of Boiler

LIST OF WORK EXPECTED TO BE SUBCONTRACTED

LIST OF SUBCONTRACTORS:

1. Electrical Work - GSH Electric
2. Steel Work - North American Mfg. Corp.
3. Control Wiring - TBD
4. GC Work/Demolition - BTG Contracting LLC
5. Plumbing Work - TBD
6. Roofing Work - TBD
7. Piping Work - TBD
8. Balancing Work - TBD
9. Insulation Work - TBD
10. Duct Work - TBD

PRELIMINARY BAR CHART TIME SCHEDULE
(SENT AS SEPARATE PDF ATTACHMENT)

Mapleton Branch Library

CDE Air Conditioning

Preliminary Schedule 3-27-23

Project Start: 4/30/2023

TASK DESCRIPTION	PLAN START	PLAN END	TYPE
	4/30/2023	11/1/2024	
Pre-Construction			
Letter Of Award	4/30/2023	5/3/2023	B
NTP	5/30/2023	6/2/2023	B
Permits	6/30/2023	8/30/2023	B
HASP	6/30/2023	8/30/2023	B
Subcontractor Approval	6/30/2023	8/30/2023	B
CPM Submission	5/30/2023	6/30/2023	B
			B
Procurement			
Duct Cleaning Procedure	7/1/2023	8/1/2023	G
Electrical Shop Standards	7/1/2023	8/1/2023	G
Submit VFD's	7/1/2023	8/1/2023	G
Submit Concrete	7/1/2023	8/1/2023	G
Submit Acoustical Barrier Walls	7/1/2023	8/1/2023	G
Submit Structural Steel	7/1/2023	8/1/2023	G
Submit Roofng Materials	7/1/2023	8/1/2023	G
Submit Firestopping	7/1/2023	8/1/2023	G
Submit Access Doors	7/1/2023	8/1/2023	G
Submit Gypsum	7/1/2023	8/1/2023	G
Submit Acoustical Ceiling	7/1/2023	8/1/2023	G
Submit Paint	7/1/2023	8/1/2023	G
Submit Louvers	7/1/2023	8/1/2023	G
Submit Plumbing Materials	7/1/2023	8/1/2023	G
Submit Identification	7/1/2023	8/1/2023	G
Submit Piping Shop Standards	7/1/2023	8/1/2023	G
Submit Vibration Isolation	7/1/2023	8/1/2023	G
Submit Insulation	7/1/2023	8/1/2023	G

Mapleton Branch Library

CDE Air Conditioning

Preliminary Schedule 3-27-23

Project Start: 4/30/2023

55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
12 Ma 24	19 Ma 24	26 Ma 24	2 Ju 24	9 Ju 24	16 Ju 24	23 Ju 24	30 Ju 24	7 Ju 24	14 Ju 24	21 Ju 24	28 Ju 24	4 Au 24	11 Au 24	18 Au 24	25 Au 24	1 Se 24	8 Se 24

73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
15 Se 24	22 Se 24	29 Se 24	6 Oc 24	13 Oc 24	20 Oc 24	27 Oc 24	3 No 24	10 No 24	17 No 24	24 No 24	1 De 24	8 De 24	15 De 24	22 De 24	29 De 24	5 Ja 25	12 Ja 25

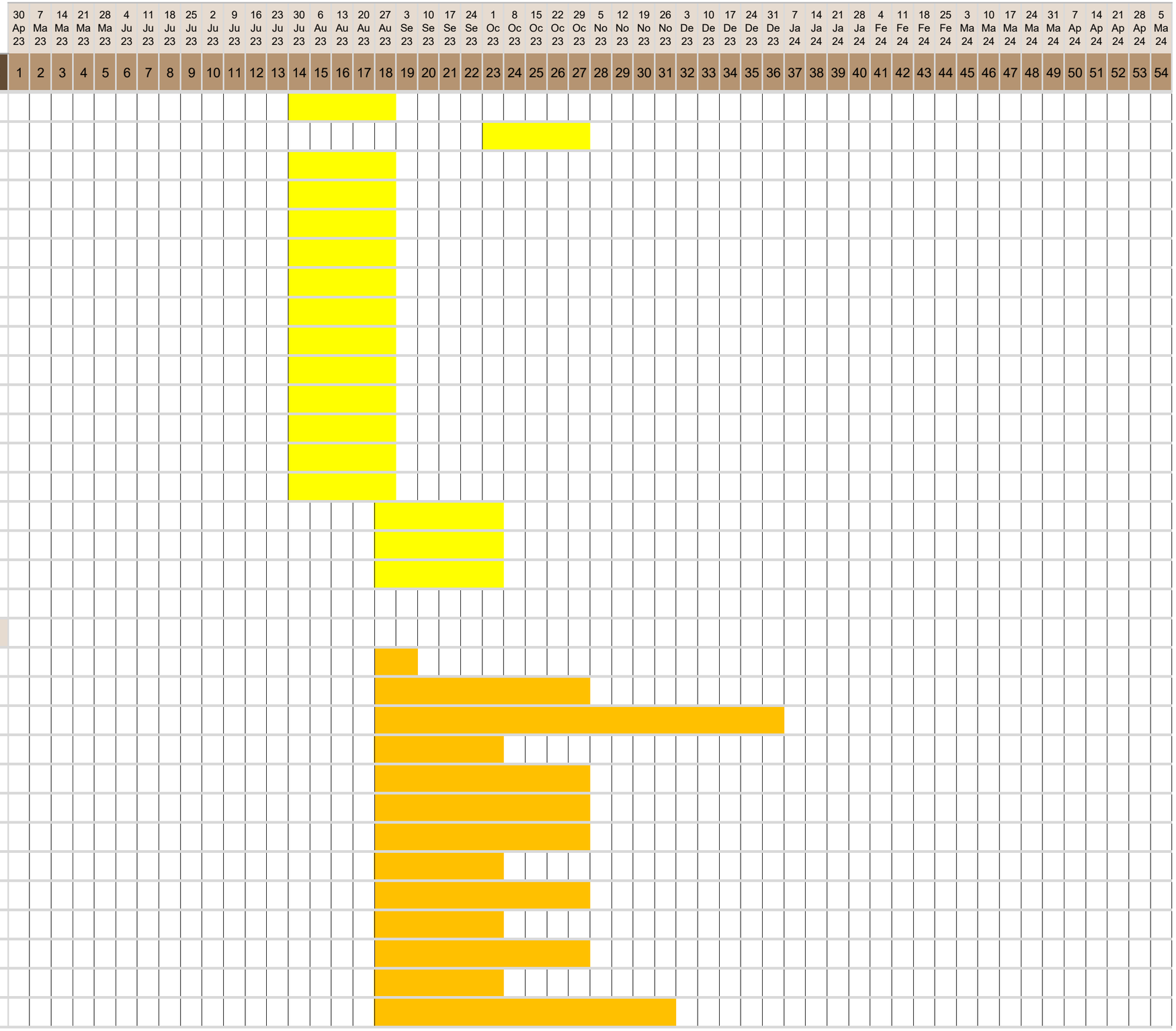
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
19 Ja 25	26 Ja 25	2 Fe 25	9 Fe 25	16 Fe 25	23 Fe 25	2 Ma 25	9 Ma 25	16 Ma 25	23 Ma 25	30 Ma 25	6 Ap 25	13 Ap 25	20 Ap 25	27 Ap 25	4 Ma 25	11 Ma 25	18 Ma 25

TASK DESCRIPTION	PLAN START	PLAN END	TYPE
	4/30/2023	11/1/2024	
Pre-Construction			
Letter Of Award	4/30/2023	5/3/2023	B
NTP	5/30/2023	6/2/2023	B
Permits	6/30/2023	8/30/2023	B
HASP	6/30/2023	8/30/2023	B
Subcontractor Approval	6/30/2023	8/30/2023	B
CPM Submission	5/30/2023	6/30/2023	B
			B
Procurement			
Duct Cleaning Procedure	7/1/2023	8/1/2023	G
Electrical Shop Standards	7/1/2023	8/1/2023	G
Submit VFD's	7/1/2023	8/1/2023	G
Submit Concrete	7/1/2023	8/1/2023	G
Submit Acoustical Barrier Walls	7/1/2023	8/1/2023	G
Submit Structural Steel	7/1/2023	8/1/2023	G
Submit Roofng Materials	7/1/2023	8/1/2023	G
Submit Firestopping	7/1/2023	8/1/2023	G
Submit Access Doors	7/1/2023	8/1/2023	G
Submit Gypsum	7/1/2023	8/1/2023	G
Submit Acoustical Ceiling	7/1/2023	8/1/2023	G
Submit Paint	7/1/2023	8/1/2023	G
Submit Louvers	7/1/2023	8/1/2023	G
Submit Plumbing Materials	7/1/2023	8/1/2023	G
Submit Identification	7/1/2023	8/1/2023	G
Submit Piping Shop Standards	7/1/2023	8/1/2023	G
Submit Vibration Isolation	7/1/2023	8/1/2023	G
Submit Insulation	7/1/2023	8/1/2023	G

TASK DESCRIPTION	PLAN START	PLAN END	TYPE
Submit DDC Controls	8/1/2023	10/1/2023	G
Submit Ductwork Shop Standards	7/1/2023	8/1/2023	G
Submit Fans	7/1/2023	8/1/2023	G
Submit Air Outlets	7/1/2023	8/1/2023	G
Submit AHU's	7/1/2023	8/1/2023	G
Submit RTU's	7/1/2023	8/1/2023	G
Submit Split Systems	7/1/2023	8/1/2023	G
Submit ECUH's	7/1/2023	8/1/2023	G
Submit EUH's	7/1/2023	8/1/2023	G
Submit Lighting	7/1/2023	8/1/2023	G
Submit Fire Alarm	7/1/2023	8/1/2023	G
Submit Heat Recovery Units	7/1/2023	8/1/2023	G
Submit Energy Recovery Vent.	7/1/2023	8/1/2023	G
Review and Approval			
R&A Duct Cleaning Procedure	8/1/2023	9/1/2023	Y
R&A Electrical Shop Standards	8/1/2023	9/1/2023	Y
R&A VFD's	8/1/2023	9/1/2023	Y
R&A Concrete	8/1/2023	9/1/2023	Y
R&A Acoustical Barrier Walls	8/1/2023	9/1/2023	Y
R&A Structural Steel	8/1/2023	9/1/2023	Y
R&A Roofng Materials	8/1/2023	9/1/2023	Y
R&A Firestopping	8/1/2023	9/1/2023	Y
R&A Access Doors	8/1/2023	9/1/2023	Y
R&A Gypsum	8/1/2023	9/1/2023	Y
R&A Acoustical Ceiling	8/1/2023	9/1/2023	Y
R&A Paint	8/1/2023	9/1/2023	Y
R&A Louvers	8/1/2023	9/1/2023	Y
R&A Plumbing Materials	8/1/2023	9/1/2023	Y
R&A Identification	8/1/2023	9/1/2023	Y
R&A Piping Shop Standards	8/1/2023	9/1/2023	Y
R&A Vibration Isolation	9/1/2023	10/1/2023	Y

TASK DESCRIPTION	PLAN START	PLAN END	TYPE
Submit DDC Controls	8/1/2023	10/1/2023	G
Submit Ductwork Shop Standards	7/1/2023	8/1/2023	G
Submit Fans	7/1/2023	8/1/2023	G
Submit Air Outlets	7/1/2023	8/1/2023	G
Submit AHU's	7/1/2023	8/1/2023	G
Submit RTU's	7/1/2023	8/1/2023	G
Submit Split Systems	7/1/2023	8/1/2023	G
Submit ECUH's	7/1/2023	8/1/2023	G
Submit EUH's	7/1/2023	8/1/2023	G
Submit Lighting	7/1/2023	8/1/2023	G
Submit Fire Alarm	7/1/2023	8/1/2023	G
Submit Heat Recovery Units	7/1/2023	8/1/2023	G
Submit Energy Recovery Vent.	7/1/2023	8/1/2023	G
Review and Approval			
R&A Duct Cleaning Procedure	8/1/2023	9/1/2023	Y
R&A Electrical Shop Standards	8/1/2023	9/1/2023	Y
R&A VFD's	8/1/2023	9/1/2023	Y
R&A Concrete	8/1/2023	9/1/2023	Y
R&A Acoustical Barrier Walls	8/1/2023	9/1/2023	Y
R&A Structural Steel	8/1/2023	9/1/2023	Y
R&A Roofng Materials	8/1/2023	9/1/2023	Y
R&A Firestopping	8/1/2023	9/1/2023	Y
R&A Access Doors	8/1/2023	9/1/2023	Y
R&A Gypsum	8/1/2023	9/1/2023	Y
R&A Acoustical Ceiling	8/1/2023	9/1/2023	Y
R&A Paint	8/1/2023	9/1/2023	Y
R&A Louvers	8/1/2023	9/1/2023	Y
R&A Plumbing Materials	8/1/2023	9/1/2023	Y
R&A Identification	8/1/2023	9/1/2023	Y
R&A Piping Shop Standards	8/1/2023	9/1/2023	Y
R&A Vibration Isolation	9/1/2023	10/1/2023	Y

TASK DESCRIPTION	PLAN START	PLAN END	TYPE
R&A Insulation	8/1/2023	9/1/2023	Y
R&A DDC Controls	10/1/2023	11/1/2023	Y
R&A Ductwork Shop Standards	8/1/2023	9/1/2023	Y
R&A Fans	8/1/2023	9/1/2023	Y
R&A Air Outlets	8/1/2023	9/1/2023	Y
R&A AHU's	8/1/2023	9/1/2023	Y
R&A RTU's	8/1/2023	9/1/2023	Y
R&A Split Systems	8/1/2023	9/1/2023	Y
R&A ECUH's	8/1/2023	9/1/2023	Y
R&A EUH's	8/1/2023	9/1/2023	Y
R&A Lighting	8/1/2023	9/1/2023	Y
R&A Fire Alarm	8/1/2023	9/1/2023	Y
R&A Heat Recovery Units	8/1/2023	9/1/2023	Y
R&A Energy Recovery Vent.	8/1/2023	9/1/2023	Y
Piping Drawings	9/1/2023	10/1/2023	Y
Duct Drawings	9/1/2023	10/1/2023	Y
Steel Drawings	9/1/2023	10/1/2023	Y
Fabrication & Delivery			
F&D Duct Cleaning Procedure	9/1/2023	9/3/2023	O
F&D Electrical Shop Standards	9/1/2023	11/1/2023	O
F&D VFD's	9/1/2023	1/1/2024	O
F&D Concrete	9/1/2023	10/1/2023	O
F&D Acoustical Barrier Walls	9/1/2023	11/1/2023	O
F&D Structural Steel	9/1/2023	11/1/2023	O
F&D Roofng Materials	9/1/2023	11/1/2023	O
F&D Firestopping	9/1/2023	10/1/2023	O
F&D Access Doors	9/1/2023	11/1/2023	O
F&D Gypsum	9/1/2023	10/1/2023	O
F&D Acoustical Ceiling	9/1/2023	11/1/2023	O
F&D Paint	9/1/2023	10/1/2023	O
F&D Louvers	9/1/2023	12/1/2023	O



TASK DESCRIPTION	PLAN START	PLAN END	TYPE
R&A Insulation	8/1/2023	9/1/2023	Y
R&A DDC Controls	10/1/2023	11/1/2023	Y
R&A Ductwork Shop Standards	8/1/2023	9/1/2023	Y
R&A Fans	8/1/2023	9/1/2023	Y
R&A Air Outlets	8/1/2023	9/1/2023	Y
R&A AHU's	8/1/2023	9/1/2023	Y
R&A RTU's	8/1/2023	9/1/2023	Y
R&A Split Systems	8/1/2023	9/1/2023	Y
R&A ECUH's	8/1/2023	9/1/2023	Y
R&A EUH's	8/1/2023	9/1/2023	Y
R&A Lighting	8/1/2023	9/1/2023	Y
R&A Fire Alarm	8/1/2023	9/1/2023	Y
R&A Heat Recovery Units	8/1/2023	9/1/2023	Y
R&A Energy Recovery Vent.	8/1/2023	9/1/2023	Y
Piping Drawings	9/1/2023	10/1/2023	Y
Duct Drawings	9/1/2023	10/1/2023	Y
Steel Drawings	9/1/2023	10/1/2023	Y
Fabrication & Delivery			
F&D Duct Cleaning Procedure	9/1/2023	9/3/2023	O
F&D Electrical Shop Standards	9/1/2023	11/1/2023	O
F&D VFD's	9/1/2023	1/1/2024	O
F&D Concrete	9/1/2023	10/1/2023	O
F&D Acoustical Barrier Walls	9/1/2023	11/1/2023	O
F&D Structural Steel	9/1/2023	11/1/2023	O
F&D Roofng Materials	9/1/2023	11/1/2023	O
F&D Firestopping	9/1/2023	10/1/2023	O
F&D Access Doors	9/1/2023	11/1/2023	O
F&D Gypsum	9/1/2023	10/1/2023	O
F&D Acoustical Ceiling	9/1/2023	11/1/2023	O
F&D Paint	9/1/2023	10/1/2023	O
F&D Louvers	9/1/2023	12/1/2023	O

TASK DESCRIPTION	PLAN START	PLAN END	TYPE
F&D Plumbing Materials	9/1/2023	11/1/2023	O
F&D Identification	9/1/2023	10/1/2023	O
F&D Piping Shop Standards	9/1/2023	10/1/2023	O
F&D Vibration Isolation	10/1/2023	12/1/2023	O
F&D Insulation	9/1/2023	10/1/2023	O
F&D DDC Controls	10/1/2023	2/1/2024	O
F&D Ductwork Shop Standards	9/1/2023	11/1/2023	O
F&D Fans	9/1/2023	2/1/2024	O
F&D Air Outlets	9/1/2023	1/1/2024	O
F&D AHU's	9/1/2023	3/1/2024	O
F&D RTU's	9/1/2023	3/1/2024	O
F&D Split Systems	9/1/2023	2/1/2024	O
F&D ECUH's	9/1/2023	1/1/2024	O
F&D EUH's	9/1/2023	1/1/2024	O
F&D Lighting	9/1/2023	2/1/2024	O
F&D Fire Alarm	9/1/2023	5/1/2024	O
F&D Heat Recovery Units	9/1/2023	3/1/2024	O
F&D Energy Recovery Vent.	9/1/2023	3/1/2024	O
Ductwork Fabrication	10/1/2023	11/1/2023	O
Steelwork Fabrication	10/1/2023	11/1/2023	O
Construction			
Mobilization	9/1/2023	9/5/2023	R
Set Up Field Office	9/5/2023	9/10/2023	R
Install Project Sign	9/10/2023	9/12/2023	R
Pre-Test Air Readings	9/18/2023	9/22/2023	R
Ceiling Removal Cellar	9/22/2023	10/6/2023	R
Remove/Store Light Fixtures Cellar	10/6/2023	10/13/2023	R
Ceiling Removal 1st Floor	10/13/2023	10/27/2023	R
Window Head Soffit Removal 1st	10/27/2023	11/3/2023	R
Remove Light Fixtures 1st Floor	10/27/2023	11/3/2023	R
Remove Wall fro Louver 1st Flr	11/3/2023	11/10/2023	R

TASK DESCRIPTION	PLAN START	PLAN END	TYPE	12 Ma 24	19 Ma 24	26 Ma 24	2 Ju 24	9 Ju 24	16 Ju 24	23 Ju 24	30 Ju 24	7 Ju 24	14 Ju 24	21 Ju 24	28 Ju 24	4 Au 24	11 Au 24	18 Au 24	25 Au 24	1 Se 24	8 Se 24	15 Se 24	22 Se 24	29 Se 24	6 Oc 24	13 Oc 24	20 Oc 24	27 Oc 24	3 No 24	10 No 24	17 No 24	24 No 24	1 De 24	8 De 24	15 De 24	22 De 24	29 De 24	5 Ja 25	12 Ja 25	19 Ja 25	26 Ja 25	2 Fe 25	9 Fe 25	16 Fe 25	23 Fe 25	2 Ma 25	9 Ma 25	16 Ma 25	23 Ma 25	30 Ma 25	6 Ap 25	13 Ap 25	20 Ap 25	27 Ap 25	4 Ma 25	11 Ma 25	18 Ma 25
				55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
F&D Plumbing Materials	9/1/2023	11/1/2023	O																																																						
F&D Identification	9/1/2023	10/1/2023	O																																																				
F&D Piping Shop Standards	9/1/2023	10/1/2023	O																																																			
F&D Vibration Isolation	10/1/2023	12/1/2023	O																																																			
F&D Insulation	9/1/2023	10/1/2023	O																																																			
F&D DDC Controls	10/1/2023	2/1/2024	O																																																			
F&D Ductwork Shop Standards	9/1/2023	11/1/2023	O																																																			
F&D Fans	9/1/2023	2/1/2024	O																																																			
F&D Air Outlets	9/1/2023	1/1/2024	O																																																			
F&D AHU's	9/1/2023	3/1/2024	O																																																			
F&D RTU's	9/1/2023	3/1/2024	O																																																			
F&D Split Systems	9/1/2023	2/1/2024	O																																																			
F&D ECUH's	9/1/2023	1/1/2024	O																																																			
F&D EUH's	9/1/2023	1/1/2024	O																																																			
F&D Lighting	9/1/2023	2/1/2024	O																																																			
F&D Fire Alarm	9/1/2023	5/1/2024	O																																																			
F&D Heat Recovery Units	9/1/2023	3/1/2024	O																																																			
F&D Energy Recovery Vent.	9/1/2023	3/1/2024	O																																																			
Ductwork Fabrication	10/1/2023	11/1/2023	O																																																			
Steelwork Fabrication	10/1/2023	11/1/2023	O				3																																															
Construction																																																					
Mobilization	9/1/2023	9/5/2023	R																																																			
Set Up Field Office	9/5/2023	9/10/2023	R																																																			
Install Project Sign	9/10/2023	9/12/2023	R																																																			
Pre-Test Air Readings	9/18/2023	9/22/2023	R																																																			
Ceiling Removal Cellar	9/22/2023	10/6/2023	R																																																			
Remove/Store Light Fixtures Cellar	10/6/2023	10/13/2023	R																																																			
Ceiling Removal 1st Floor	10/13/2023	10/27/2023	R																																																			
Window Head Soffit Removal 1st	10/27/2023	11/3/2023	R																																																			
Remove Light Fixtures 1st Floor	10/27/2023	11/3/2023	R																																																			
Remove Wall fro Louver 1st Flr	11/3/2023	11/10/2023	R																																																			

TASK DESCRIPTION	PLAN START	PLAN END	TYPE
Ceiling Removal 2nd Floor	11/10/2023	11/24/2023	R
Window Head Soffit Removal 2nd	11/24/2023	12/1/2023	R
Remove Light Fixtures 2nd Floor	12/1/2023	12/8/2023	R
Remove/Store Light Fixtures 2nd Fl	12/1/2023	12/8/2023	R
Refrigerant Removal Ext Equip.	12/8/2023	12/15/2023	R
MEP Demolition Cellar	12/15/2023	12/29/2023	R
MEP Demolition 1st Flr	12/29/2023	1/12/2024	R
MEP Demolition 2nd Floor	1/12/2024	1/26/2024	R
MEP Demolition Roof	1/26/2024	2/9/2024	R
Install Duct Cellar	2/9/2024	3/8/2024	R
Install Piping Cellar	2/16/2024	3/8/2024	R
Install Electrical Cellar	2/16/2024	3/8/2024	R
Install HRU Units Cellar	2/16/2024	3/8/2024	R
Install ERV-1 Cellar	2/16/2024	3/8/2024	R
Install AC-1 Cellar	2/16/2024	3/8/2024	R
Install Lighting Cellar	3/8/2024	3/22/2024	R
Install FA Cellar	3/8/2024	3/22/2024	R
Install Air Outlets Cellar	3/8/2024	3/22/2024	R
Install Insulation Cellar	3/8/2024	3/22/2024	R
Install Controls Cellar	3/8/2024	3/22/2024	R
Install Ceiling Cellar	3/22/2024	4/5/2024	R
Install Duct 1st Flr	4/5/2024	4/19/2024	R
Install Piping 1st Flr	4/12/2024	4/26/2024	R
Install Electrical 1st Flr	4/12/2024	4/26/2024	R
Install Lighting 1st Flr	4/12/2024	4/26/2024	R
Install Air Outlets 1st Flr	4/12/2024	4/26/2024	R
Install FA 1st Flr	4/12/2024	4/26/2024	R
Install HRU Units 1st Flr	4/12/2024	4/26/2024	R
Install Insulation 1st Flr	4/12/2024	4/26/2024	R
Install Controls 1st Flr	4/12/2024	4/26/2024	R
Install Ceiling 1st Flr	4/26/2024	5/10/2024	R
Install Duct 2nd Flr	5/10/2024	5/24/2024	R

TASK DESCRIPTION	PLAN START	PLAN END	TYPE
Ceiling Removal 2nd Floor	11/10/2023	11/24/2023	R
Window Head Soffit Removal 2nd	11/24/2023	12/1/2023	R
Remove Light Fixtures 2nd Floor	12/1/2023	12/8/2023	R
Remove/Store Light Fixtures 2nd Fl	12/1/2023	12/8/2023	R
Refrigerant Removal Ext Equip.	12/8/2023	12/15/2023	R
MEP Demolition Cellar	12/15/2023	12/29/2023	R
MEP Demolition 1st Flr	12/29/2023	1/12/2024	R
MEP Demolition 2nd Floor	1/12/2024	1/26/2024	R
MEP Demolition Roof	1/26/2024	2/9/2024	R
Install Duct Cellar	2/9/2024	3/8/2024	R
Install Piping Cellar	2/16/2024	3/8/2024	R
Install Electrical Cellar	2/16/2024	3/8/2024	R
Install HRU Units Cellar	2/16/2024	3/8/2024	R
Install ERV-1 Cellar	2/16/2024	3/8/2024	R
Install AC-1 Cellar	2/16/2024	3/8/2024	R
Install Lighting Cellar	3/8/2024	3/22/2024	R
Install FA Cellar	3/8/2024	3/22/2024	R
Install Air Outlets Cellar	3/8/2024	3/22/2024	R
Install Insulation Cellar	3/8/2024	3/22/2024	R
Install Controls Cellar	3/8/2024	3/22/2024	R
Install Ceiling Cellar	3/22/2024	4/5/2024	R
Install Duct 1st Flr	4/5/2024	4/19/2024	R
Install Piping 1st Flr	4/12/2024	4/26/2024	R
Install Electrical 1st Flr	4/12/2024	4/26/2024	R
Install Lighting 1st Flr	4/12/2024	4/26/2024	R
Install Air Outlets 1st Flr	4/12/2024	4/26/2024	R
Install FA 1st Flr	4/12/2024	4/26/2024	R
Install HRU Units 1st Flr	4/12/2024	4/26/2024	R
Install Insulation 1st Flr	4/12/2024	4/26/2024	R
Install Controls 1st Flr	4/12/2024	4/26/2024	R
Install Ceiling 1st Flr	4/26/2024	5/10/2024	R
Install Duct 2nd Flr	5/10/2024	5/24/2024	R

12 Ma 24	19 Ma 24	26 Ma 24	2 Ju 24	9 Ju 24	16 Ju 24	23 Ju 24	30 Ju 24	7 Ju 24	14 Ju 24	21 Ju 24	28 Ju 24	4 Au 24	11 Au 24	18 Au 24	25 Au 24	1 Se 24	8 Se 24	15 Se 24	22 Se 24	29 Se 24	6 Oc 24	13 Oc 24	20 Oc 24	27 Oc 24	3 No 24	10 No 24	17 No 24	24 No 24	1 De 24	8 De 24	15 De 24	22 De 24	29 De 24	5 Ja 25	12 Ja 25	19 Ja 25	26 Ja 25	2 Fe 25	9 Fe 25	16 Fe 25	23 Fe 25	2 Ma 25	9 Ma 25	16 Ma 25	23 Ma 25	30 Ma 25	6 Ap 25	13 Ap 25	20 Ap 25	27 Ap 25	4 Ma 25	11 Ma 25	18 Ma 25
55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108

TASK DESCRIPTION	PLAN START	PLAN END	TYPE
Install Piping 2nd Flr	5/17/2024	5/31/2024	R
Install Electrical 2nd Flr	5/17/2024	5/31/2024	R
Install HRU Units 2nd Flr	5/17/2024	5/31/2024	R
Install Lighting 2nd Flr	5/17/2024	5/31/2024	R
Install Air Outlets 2nd Flr	5/17/2024	5/31/2024	R
Instal FA 2nd Flr	5/17/2024	5/31/2024	R
Install Insulation 2nd Flr	5/31/2024	6/7/2024	R
Install Controls 2nd Flr	5/31/2024	6/7/2024	R
Install Ceiling 2nd Flr	6/7/2024	6/21/2024	R
Close Up Masonary Wall Roof	6/21/2024	6/28/2024	R
Close Up Shafts Roof	6/28/2024	7/5/2024	R
Install Steelwork Roof	7/5/2024	7/26/2024	R
Roofing Repair Work	7/5/2024	7/26/2024	R
Rig Equipment On Roof	7/26/2024	8/2/2024	R
Install Acoustical Wall Panels	8/2/2024	8/16/2024	R
Install Ductwork	8/16/2024	8/30/2024	R
Install Electrical Work	8/16/2024	8/30/2024	R
Install FA Work	8/16/2024	8/30/2024	R
Install Controls Roof	8/16/2024	8/30/2024	R
Install Insulation	8/30/2024	9/13/2024	R
Duct Cleaning	9/13/2024	9/20/2024	R
Closeout			
Start Up & Testing	9/13/2024	9/20/2024	P
Balancing	9/20/2024	9/27/2024	P
Commisioning	9/27/2024	10/4/2024	P
Install Identification	9/27/2024	10/4/2024	P
As Built Drawings	9/27/2024	10/4/2024	P
O&M Manuals	9/27/2024	10/4/2024	P
Training	10/4/2024	10/11/2024	P
Punchlist	10/11/2024	10/30/2024	P
Close Out	10/15/2024	11/1/2024	P

TASK DESCRIPTION	PLAN START	PLAN END	TYPE
Install Piping 2nd Flr	5/17/2024	5/31/2024	R
Install Electrical 2nd Flr	5/17/2024	5/31/2024	R
Install HRU Units 2nd Flr	5/17/2024	5/31/2024	R
Install Lighting 2nd Flr	5/17/2024	5/31/2024	R
Install Air Outlets 2nd Flr	5/17/2024	5/31/2024	R
Instal FA 2nd Flr	5/17/2024	5/31/2024	R
Install Insulation 2nd Flr	5/31/2024	6/7/2024	R
Install Controls 2nd Flr	5/31/2024	6/7/2024	R
Install Ceiling 2nd Flr	6/7/2024	6/21/2024	R
Close Up Masonary Wall Roof	6/21/2024	6/28/2024	R
Close Up Shafts Roof	6/28/2024	7/5/2024	R
Install Steelwork Roof	7/5/2024	7/26/2024	R
Roofing Repair Work	7/5/2024	7/26/2024	R
Rig Equipment On Roof	7/26/2024	8/2/2024	R
Install Acoustical Wall Panels	8/2/2024	8/16/2024	R
Install Ductwork	8/16/2024	8/30/2024	R
Install Electrical Work	8/16/2024	8/30/2024	R
Install FA Work	8/16/2024	8/30/2024	R
Install Controls Roof	8/16/2024	8/30/2024	R
Install Insulation	8/30/2024	9/13/2024	R
Duct Cleaning	9/13/2024	9/20/2024	R
Closeout			
Start Up & Testing	9/13/2024	9/20/2024	P
Balancing	9/20/2024	9/27/2024	P
Commisioning	9/27/2024	10/4/2024	P
Install Identification	9/27/2024	10/4/2024	P
As Built Drawings	9/27/2024	10/4/2024	P
O&M Manuals	9/27/2024	10/4/2024	P
Training	10/4/2024	10/11/2024	P
Punchlist	10/11/2024	10/30/2024	P
Close Out	10/15/2024	11/1/2024	P

T C N Y r D r S C r C U
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P 1 13 3 3
F 1 1 -

CONSTRUCTION EMPLOYMENT REPORT

GENERAL INFORMATION

1. Your contractual relationship in this contract is: Prime contractor_X_ Subcontractor____

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

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

N/A

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

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

3. Please indicate if you would like assistance from SBS in identifying certified M/WBEs for contracting opportunities: Yes___ No_X_

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

5. Are you a Union contractor? Yes _X_ No ____ If yes, please list which local(s) you affiliated with ____Local 638 - Steamfitters_____

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

PART I: CONTRACTOR/SUBCONTRACTOR INFORMATION

7. 112217107 josepha@cdeair.com
Employer Identification Number or Federal Tax I.D. Email Address

8. C.D.E. Air Conditioning Co., Inc.
Company Name

9. 321 39th Street, Brooklyn, NY 11232
Company Address and Zip Code

10. Joseph F. Azara 718-788-1040
Chief Operating Officer Telephone Number

11. Mitchell I. Merdinger 718-788-1040
Designated Equal Opportunity Compliance Officer Telephone Number
(If same as Item #10, write "same")

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

13. Number of employees in your company: 17

14. Contract information:

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

(b) $4,667,813.00
Contract Amount

(c) 85023B0033
Procurement Identification Number (PIN)

(d) LBC16MPHC
Contract Registration Number (CT#)

(e) TBD
Projected Commencement Date

(f) TBD
Projected Completion Date

(g) Description and location of proposed contract:

Mapleton Branch Library HVAC Replacement

15. Has your firm been reviewed by the Division of Labor Services (DLS) within the past 36 months and issued a Certificate of Approval? Yes X No___

If yes, attach a copy of certificate. (*Next Page)

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

If yes, attach a copy of certificate.

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

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

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

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

If yes,

Small Business Services
careers
businesses
neighborhoods

Kevin D. Kim
Commissioner

1 Liberty Plaza
11th Floor
New York, NY 10006

212.513.6300 tel
212.618.8891 fax
711 NY Relay

DLS #222CY520

December 9, 2022

Mr. Mitchell Merdinger
Vice President
C.D.E. Air Conditioning Company, Inc.
321 39th Street
Brooklyn, NY 11232

RE: **NYC Policy Department (NYPD) Contract**; Pin # 05622B0012; Replace and upgrade HVAC equipment & Accessories for Manhattan North Precinct; Contract Value: **$1,513,075.00**; **Continued Certificate of Approval**.

Dear Mr. Merdinger:

Please be advised that **C.D.E. Air Conditioning Company, Inc.** has already received notice of its approval for the three (3) year period indicated in the Department of Small Business Services/Division of Labor Services (DLS) Certificate of Approval dated May 14, 2021, for DLS File No. 220CY319.

As your organization continues to meet the equal employment opportunity requirements of the City of New York, DLS approves the awarding of the above-referenced contract. This approval does not extend the initial three (3) year approval **(April 28, 2020 – April 27, 2023**) referred to above.

If you have any questions, please call Judy Mitchell-Albert, Project Manager at (212) 513-9272 or e-mail her at jmitchell-albert@sbs.nyc.gov.

Very truly yours,

Miri Shpuza/MS
Chief Vendor Compliance Officer
Division of Labor Services

c: Jordan Glickstein (NYPD)
Judy Mitchell-Albert (SBS)
File

(a) Name and address of OFCCP office.

_____

_____

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

If yes, attach a copy of such certificate.

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

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

(d) Were any deficiencies found? Yes___ No_X_

If yes, attach a copy of such findings.

19. Is your company or its affiliates a member or members of an employers' trade association which is responsible for negotiating collective bargaining agreements (CBA) which affect construction site hiring? Yes_X_ No___

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

(please see attachements at the end of this document)

PART II: DOCUMENTS REQUIRED

(Please see attachements at the end of this document)

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

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

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

x (c) Employee Policy/Handbook

_____ (d) Personnel Policy/Manual

_____ (e) Supervisor's Policy/Manual

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

x (g) Collective bargaining agreement(s).

x (h) Employment Application(s)

_____ (i) Employee evaluation policy/form(s).

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

x (k) Sexual Harassment Policy

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

(a)	Prior to job offer	Yes___ No_X_
(b)	After a conditional job offer	Yes___ No_X_
(c)	After a job offer	Yes_X_ No___
(d)	Within the first three days on the job	Yes_X_ No___
(e)	To some applicants	Yes___ No_X_
(f)	To all applicants	Yes___ No_X_
(g)	To some employees	Yes___ No_X_
(h)	To all employees	Yes_X_ No___

22. Explain where and how completed I-9 Forms, with their supportive documentation, are maintained and made accessible.
it is maintained in a folder for each employee, separately.

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

If yes, is the medical examination given:

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

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

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

If yes, list the document(s) and page number(s) where these written policies are located.
Can be found on our website, a shared drive all employees have access and our employment application form.

25. Does the company have a current affirmative action plan(s) (AAP)
_X___Minorities and Women
_X___Individuals with handicaps
_____Other. Please specify _____

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

If yes, please attach a copy of this policy. (*Next page)

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

CDE Air Conditioning
Grievance Procedure

Introduction
Although we seek to provide a workplace in which all employees feel that they are an important part of CDE Air Conditioning, and where employees feel fairly treated, there may be times when you have a dispute with a supervisor or the Company which can best be resolved through a formal procedure for dispute resolution. All disputes between any employee and the Company are to be resolved by in accordance with the following procedure. Please note, however, that the Company reserves the right to modify this procedure at any time and nothing in this procedure should be construed to constitute a contract between you and the Company or to constitute any part of a contract between you and the Company.

Any dispute between you and the Company may be resolved using this grievance procedure, with the exception of oral reprimands which are not recorded in your personnel file.

A grievance is a complaint by an employee concerning any matter related to the employee's employment with the Company. All grievances must be in writing, you must state clearly and concisely all the known facts related to your grievance, including "who, what, where, when and the why." Clearly explain why you disagree with act or omission that forms the basis for the grievance. Also explain what remedy you are requesting. You must sign and date the grievance.

Grievance Procedure

Preliminary Step
You must first address your grievance with your immediate supervisor. This may be done orally in informal discussion. If your informal attempts to resolve the matter are not successful, you may implement the formal grievance process.

Step 1
You must first submit your grievance in writing to your immediate supervisor. Grievances must be submitted within [*30*] calendar days following the date you first knew or should have known of the grievance. If you do not submit the grievance within the [*30*] day period, you waive your right to assert it.

Your supervisor will respond in writing within ten (10) days following receipt of your grievance. All grievances and replies in Step 1 must be in writing. If the grievance is not settled in Step 1, then you may proceed to Step 2.

Step 2
Within ten (10) days following your receipt of the written answer to your Step 1 grievance from your supervisor, you may appeal the disposition of your grievance by your supervisor to the president The president will then undertake an investigation of your grievance and the underlying facts. Within 15 business days following receipt of your grievance the president

will meet with you in person to discuss your grievance. The president will then provide a written response to your grievance within 15 business days following the date of your meeting.

Step 3

You may appeal a Step 2 grievance to Step 3 and request final and binding arbitration of your grievance. The request for arbitration must be in writing and must be made within 30 days following receipt of the response of the President.

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

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

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

If yes, attach a log. See instructions.

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

If yes, list the job(s), submit a job description and state the reason(s) for the qualification(s).
___Steamfitter - Steamfitting, physical requirement_____
_____

30. Are there any jobs for which there are age, race, color, national origin, sex, creed, disability, marital status, sexual orientation, or citizenship qualifications? Yes___ NoX

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

SIGNATURE PAGE

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

C.D.E. Air Conditioning Co., Inc.
Contractor's Name

Paula Bravo — Office Manager
Name of person who prepared this Employment Report — Title

Joseph F. Azara — President
Name of official authorized to sign on behalf of the contractor — Title

718-788-1040
Telephone Number

Signature of authorized official — 3/29/2023 Date

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

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

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

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

Only original signatures accepted.

Sworn to before me this 29th day of March 20 23

Notary Public — Authorized Signature — 3/29/2023 Date

PAULA BRAVO
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01BR6367980
Qualified in KINGS County
Commission Expires 12/04/2025

FOR OFFICIAL USE ONLY: File No.

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

1. Do you plan to subcontractor work on this contract? Yes X No___

2. If yes, complete the chart below.

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

SUBCONTRACTOR'S NAME*	OWNERSHIP (ENTER APPROPRIATE CODE LETTERS BELOW)	WORK TO BE PERFORMED BY SUBCONTRACTOR	TRADE PROJECTED FOR USE BY SUBCONTRACTOR	PROJECTED DOLLAR VALUE OF SUBCONTRACT
GSH Electric Inc. North American Mfg. Corp. TBD	B H H	Electrical Work Steel Work Control Wiring	Electrical Work Steel Work Control Wiring	$897,800.00 $343,500.00 $125,000.00
BTG Contracting LLC Louis L. Buttermark & Sons Inc. TBD	F None None	GC Work/Demolition Plumbing Work Roofing Work	GC Work/Demolition Plumbing Work Roofing Work	$850,000.00 $16,254.00 $175,000.00
TBD TBD TBD	None None None	Piping Work Balancing Work Insulation Work	Piping Work Balancing Work Insulation Work	$180,000.00 $13,500.00 $80,000.00
TBD	None	Duct Work	Duct Work	$315,000.00

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

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

FORM B: PROJECTED WORKFORCE TOO EARLY TO DETERMINE

TRADE CLASSIFICATION CODES

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

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

Trade: _____

Union Affiliation, if applicable _____

Total (Col. #1-10): _____

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

Total Female (Col. #6 – 10): _____

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

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

_____

_____

FORM B: PROJECTED WORKFORCE TOO EARLY TO DETERMINE

Trade:

_____

Union Affiliation, if applicable

_____

Total (Col. #1-10):

_____

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

_____

Total Female (Col. #6 – 10):

_____

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

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

_____

_____

FORM C: CURRENT WORKFORCE

TRADE CLASSIFICATION CODES

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

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

Trade:
Steamfitters

Union Affiliation, if applicable
Local 638

Total (Col. #1-10):
3

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

Total Female (Col. #6 – 10):
0

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

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

Advertised online

FORM C: CURRENT WORKFORCE

TOO EARLY TO DETERMINE

Trade:

_____

Union Affiliation, if applicable

_____

Total (Col. #1-10):

_____

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

_____

Total Female
(Col. #6 – 10):

_____

	MALES					FEMALES				
	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J										
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What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

_____

_____

ATTACHMENTS
19: CURRENT COLLECTIVE BARGAINING AGREEMENT

TRADE AGREEMENT

Between

ENTERPRISE ASSOCIATION
LOCAL UNION 638

Steam, Hot Water, Hydraulic, Sprinkler, Pneumatic Tube, Ice Machine and General Pipe Fitters of New York and Vicinity, Local Union No. 638 of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada

and

MECHANICAL CONTRACTORS ASSOCIATION
OF
NEW YORK, INC.

Effective July 1, 2021

Terminates June 30, 2023

FORWARD

The Association and Employers hereby recognize Steamfitters' Local Union 638 of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada as the sole and exclusive bargaining representative for all their employees performing any work covered by this Agreement and employed by the employer in the geographical jurisdiction of the Enterprise Association, namely, the City of New York, Nassau and Suffolk counties and all of Long Island. This Agreement together with its Working Rules shall govern all steamfitting work performed under this Agreement by any contractor party to or bound by and subject to this Agreement within the trade jurisdiction as set forth herein.

INDUSTRY MISSION

It is the mission of Enterprise Association Steamfitters Local Union 638 and the Mechanical Contractors Association of New York, Inc. to build the finest mechanical and fire suppression systems in New York City, Nassau and Suffolk Counties. Our efforts will include providing highly skilled, productive craftsmen working a fair day's work for a fair day's pay.

Employers will seek to promote the industry and support continued education and training for all personnel and build the safest and most efficient projects possible for our customers.

Together, the Union and the Employers pledge to continue to provide the most cost effective, productive and highest quality work anywhere in the industry.

It is our hope that the adoption of this Standard for Excellence will be the benchmark for the industry now and in the future.

RULES

Rules of the Enterprise Association applying to work at the steamfitting trade and its many branches, in the City of New York and in Nassau and Suffolk Counties, New York and all of Long Island.

Rule I.
WORKING DAY

Section Ia. The hours of labor shall be seven (7) hours per day to be performed between six (6:00) o'clock A.M. to three-thirty (3:30) o'clock P.M., as reasonably designated by the Employer with the consent of the Union, every day for the entire work force, except Saturday and Sunday and legal holidays. The Employer shall notify the Union twenty-four (24) hours prior to the start of any job which starts at any other time than eight (8:00) o'clock A.M. Once the Employer has designated a starting time for a job, it may not be changed without the consent of the Union.

Section Ib. If a contractor has not designated a 6:00 o'clock A.M. start as per Rule I, Section Ia., and when burning, welding, soldering, chopping, core boring, drilling or material deliveries are required by the owner of an occupied building to be done before the regular hours of labor, with the request of the Employer and with the consent of the Union, the hours of labor shall be seven (7) hours per day to be performed between six (6) o'clock A.M. and one-thirty (1:30) o'clock P.M. with the first hour to be paid at a fifty (50%) percent differential of the regular rate of wages, including fringe benefits.

Section II. No steamfitter or apprentice shall be allowed to apply to any shop or office for employment except between the hours of eight (8:00) o'clock A.M. and three-thirty (3:30) o'clock P.M.

Section III. If a steamfitter is employed on Temporary Heat, the shift shall consist of eight (8) hours or eight and one-half (8 ½) hours as applicable. One or more of these shifts may be used.

Section IV. Each shift shall be known as the working day for temporary heat, every day including Saturday, Sunday and legal holidays.

Section V. The working days above named shall be known as regular time and shall be time actually employed at work.

Section VI. Shift Work may be performed during other than the regular working day as defined in Section I. All Shift Work shall be performed in accordance with Rule XV.

Section VII. Where licenses are required, no steamfitter or apprentice should knowingly work for any unlicensed contractor.

Rule II.
RATE OF WAGES

Section I. Regular time for a steamfitter except as noted in Section II of this Rule shall be paid for at the following rates:

From July 1, 2021 to June 30, 2022, $60.80 per hour ($425.60 per day of seven (7) hours) plus $18.75 per hour Welfare, $20.40 per hour Pension, $7.00 per hour Vacation, and $11.25 per hour Security Benefit Fund.

In addition to the above each employer shall pay $.74 per hour Educational Fund for each and every hour worked and 1% per hour of the Journeyman Steamfitter wage rate less fringe benefits into the Industry Promotion Fund for each and every hour worked. (See Rules XVIII, XVIII-B, XIX, XIX-B, XX, XXI, XXII, XXIII, XXIII-A and XXIII-B.)

ADDITIONAL INCREASES

July 1, 2022 to June 30, 2023 $2.25

NEW YORK CITY PAID SICK TIME ACT. The contributions made in this section are made in lieu of paid sick days to the employees. By the Parties agreeing to this provision, they expressly waive the provisions of the New York State Paid Sick Leave Law and the requirements under Section 196-b of New York State Labor Law, the New York City Paid Sick and Safe Leave Law, or comparable legislation that may be enacted by any local, state or federal government on the basis that comparable benefits are provided to the employees covered by this collective bargaining agreement in the form of contributions into various funds in lieu of paid days off.

The money increases stated above are all inclusive, that is, it includes wage increases and Pension, Welfare, Vacation, Security Benefit, and Supplemental Retirement Plan 401(a**)** contributions respectively; the contributions of $.74 on each hour worked to the Educational Fund and 1% per hour of the Journeyman Steamfitter wage rate less fringe benefits to the Steamfitting Industry Promotion Fund of New York and Long Island are over and above the agreed upon package. There will be an additional $.06 per hour worked to the Building Trades per capita, $.03 per hour worked to the Industry Development Fund, $0.04 per hour worked to the Labor Management Cooperation Committee and $0.10 per hour worked to the United Association Training Fund. All are over and above the agreed upon package.

The regular hours of labor shall be seven (7) hours per day which is to be performed between the hours of six (6:00 o'clock A.M. and three-thirty (3:30) o'clock P.M. Fractions of days worked as a result of weather, safety, act of God, or circumstances beyond the control of the contractor shall be paid for at the same rate, but no steamfitter or apprentice shall be employed for less than two hours. The lunch period under this Section shall be one-half hour and at the option of the employer, and shall be between the hours of twelve (12:00) noon and twelve-thirty (12:30) o'clock P.M., or twelve-thirty (12:30) o'clock P.M. and one (1:00) o'clock P.M. If work starts before eight (8:00) o'clock A.M. the lunch period may be adjusted accordingly. No overtime shall be paid for labor performed during the regular working day. Any steamfitter being laid off will receive a minimum of 7 hours pay for the day of lay off.

Section II. The wages and fringes of steamfitters working on the operation and/or maintenance of temporary heat and/or temporary air conditioning shall be paid and increased proportionately in accordance with the steamfitters effective wage rate and fringe benefit payments.

No steamfitter operating and/or maintaining temporary heat shall be employed for less than an eight hour shift.

Section III. Apprentices shall be paid a progressively increasing schedule of wages as noted below based on the following percentages of the wage rate and fringes payable to journeymen steamfitters and subject to the provisions of Rule XX with respect to payments to Apprentices for attendance at classes:

1st year - 40% of a journeyman steamfitter rate of wages and all fringes

2nd year - 50% of a journeyman steamfitter rate of wages and all fringes

3rd year - 60% of a journeyman steamfitter rate of wages and all fringes

4th year - 70% of a journeyman steamfitter rate of wages and all fringes

5th year - 80% of a journeyman steamfitter rate of wages and all fringes

Wherever Trainees are employed they shall be paid in accordance with the above apprenticeship rates.

Section III A. When apprentices are available, a contractor must hire one apprentice for each six (6) workers on a jobsite, e.g., six (6) workers, one (1) worker must be an apprentice; twelve (12) workers, two (2) workers must be apprentices, etc.

Section IV. When shift work, as defined in Rule XV, or in Rule XV (f) and (g) of the Public Works

Supplement, is performed steamfitters and/or apprentices shall be paid the wage rate and fringe benefit contribution rate for regular time worked plus a fifteen percent (15%) premium on both wages and fringe benefit contributions.

A shift shall be worked for a minimum of five (5) days Monday through Friday.

Shift work shall be worked for a minimum of three (3) days Monday through Friday when working at a college or university.

Section V. When the sixth (6^{th}) steamfitter is employed on a particular job, a Foreman's rate of Two Dollars ($2.00) per hour, in addition to the regular rate of wage for a journeyman steamfitter, shall be paid to the steamfitter on that job who is designated by the Employer as the Foreman.

Rule III.
RATE FOR OVERTIME AND HOLIDAYS

Section I. Any work done between three-thirty (3:30) o'clock P.M. and six (6:00) o'clock A.M. or seven (7:00) o'clock A.M. as stated in Rule I, Section I, and on Saturdays (with the exception stated in Rule I, Sections III and IV), Sundays, New Year's Day, Presidents' Day, Memorial Day, Fourth of July, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day and Christmas Day, shall be paid for at double the rate for regular time, commencing at the hour at which the steamfitter reports for work by direction of the Employer. The hours of labor for weekends or holidays shall be no less than seven (7) hours at double the rate. Fractions of days worked as a result of weather, safety, act of God, circumstances beyond the control of the contractor or if previously agreed to between the union and the employer, shall be paid for the same rate, but no steamfitter or apprentice shall be employed for less than two (2) hours at double the rate. In all cases, the holidays described herein will be observed on the day and date established by the State of New York.

On jobs shut down for safety reasons by a governmental agency and beyond the control of the union and the employer, steamfitters shall be paid only for hours worked at the time of the shut down. If the job remains shut down for safety reasons for 48 hours or more, steamfitters may be transferred to another job or laid off by telephone. If a lay off occurs due to a job being shut down for safety reasons, the steamfitter shall not receive compensation for any hours not worked.

In the event a job site is closed for a holiday not specified herein the Employer can either transfer the Employees to another job site or arrange for overtime work to compensate the Employee for any time lost. If the Employees are not transferred or paid overtime then the Employees shall be paid regular time wages

for the time lost. Overtime will be made available within five (5) working days preceding or following the holiday or holy day.

No overtime shall be paid for labor performed during the regular working day.

Section II. Except for Shift Work when it is not convenient to start work until between the hours of eleven (11:00) o'clock P.M. and four (4:00) o'clock A.M., then the steamfitter's time shall commence at eleven (11:00) o'clock P.M. and continue until said work is completed. Under these conditions, no steamfitter shall receive less than one (1) day's pay regular time.

Section III. The Employer will give Employees 24 hours' notice of scheduled overtime requirements for weekend work. All emergency overtime will be worked as required.

Rule IV.
METHOD OF PAYMENT

Section I. All steamfitters and apprentices shall be paid at quitting time in cash on Thursday or by check on Wednesday for the week ending the Tuesday prior at the option of the employer. A two hour penalty of wages and benefits will be paid in the event a steamfitter does not receive wages due him on pay day, except for extenuating circumstances as agreed by the Joint Trade Board.

If wages are paid by check, the Employer must be in compliance with the requirements of Rule XXIV of this Agreement. Payments to be made at the option of the Employer, either on the job or at the shop. When a steamfitter or apprentice is laid off or discharged or not put to work, he shall at once be paid the wages due him in cash.

If an Employer has permission to pay by check, he shall have authorization to lay off by check.

Section II. The Union may refuse to permit employees to work for any employer who is delinquent in either wage or fund payments or who fails to submit signed and timely reporting forms to the Fund Office in the format and at the times required by the Trustees, or who fails to permit the Fund Office to conduct a payroll audit within 10 days from the receipt of written demand by the Fund Office, mailed to the Employer by registered mail, return receipt requested, to conduct such audit, or who is delinquent in the furnishing of a bond or certified check, required under this Agreement.

When an employer's delinquency in fund payments causes the Union to remove employees from that employer's jobsites more than once in a ninety (90) day period, said employer shall pay one day's wages including fringe benefits to each employee who was removed from the job.

Section III. The checks issued for wages by all Employers who have received permission to pay by check shall meet the following conditions:

A. The Employer's bond shall be in compliance with the requirements of Rule XXIV.

B. Checks must be drawn on a bank with a branch in New York.

C. The Steamfitting Industry Promotion Fund will guarantee the payment of all bad checks, and will issue an additional check in the amount of $250 for any inconvenience due to a bad check issued to the steamfitter or apprentice. The payment will be provided by the Promotion Fund within 96 hours from when the Promotion Fund is notified. Steamfitters must notify the Promotion Fund within 45 days of the check having been issued.

D. Employers who are delinquent in fringe benefit payments under this contract in excess of one-half of their bond will have their check payment privilege suspended until reapproved by the Joint Trade Board.

Section IV. The Employers recognize and shall administer a checkoff system for payment of work dues from Building Trades journeyman and apprentice steamfitters to the Union who voluntarily sign a written authorization card in the form provided by the Union.

Section V. At the option of the employer, subject to the approval of the steamfitter or apprentice, wages may be paid by direct bank transfer. If so elected, wages due at layoff may be paid by the same method.

Rule V.
STEAMFITTERS TO WORK IN UNITS OF TWO

All work to be performed within the jurisdiction of Enterprise Association must be performed by journeymen steamfitters or apprentices working in units of two, one of whom must be a steamfitter. A unit shall consist of:

A. Steamfitter with a steamfitter, or

B. Steamfitter with an apprentice.

Rule VI.
WHERE STEAMFITTERS AND APPRENTICES ARE TO BE AT STARTING TIME

Each steamfitter and apprentice shall be paid from the time at which he leaves the job shanty at the beginning of work within the territory of Greater New York and all of Long Island and there shall be no board or carfare

paid to steamfitters or apprentices working in said territory.

A steamfitter who is sent to work outside of the above noted territory shall take the boat, train or car leaving either of the extreme points of the territory, as directed by his employer, going on boat, train or car leaving nearest starting time and returning take the boat, train or car arriving nearest quitting time.

Rule VII.
EXPENSES ALLOWED TO STEAMFITTERS

Each steamfitter working outside of the limits described in Rule VI shall receive from his employer traveling expenses to and from the place at which the work is located for as many trips as he is directed by his employer to make. He shall also receive a reasonable amount of board paid by him and he shall receive regular wages for all regular time consumed in traveling.

If the steamfitter leaves his work before it is completed and without the consent of his employer, it shall be at his own time and expense.

The Steamfitting Industry Promotion Fund shall pay to steamfitters the total sum of four-hundred ($400) dollars for successfully passing any welders qualification test taken after the normal working day at the Industry Training Center. This reimbursement shall be paid no more than once per requalification period, as determined by the Department of Buildings or any other governing agency.

Rule VIII.

In going from his shop to his work, or from his work to the shop, a distance of more than one mile, each steamfitter or apprentice shall receive from his employer the necessary fare.

Rule IX.
CUTTING, MAKING UP FITTINGS AND FIRE STOPPING

Section I. All pipe except sprinkler work may be cut, threaded, grooved and have fittings made up by hand or machine on the job or in the shop of the direct employer at the option of direct employer. If the said shop is a permanent shop, equipped with permanently installed pipe cutting and threading machinery, then the work shall be done by a steamfitter working alone. When a direct employer has no permanently installed pipe cutting machinery in his shop, such work shall be done in accordance with Rule V on the job or in a shop employing steamfitters in accordance with Rule V.

Pipe five (5") inches and over at the option of the direct employer, may be cut, threaded or grooved in the shop of the direct employer or in a shop employing 638 steamfitters working in accordance with Rule V.

Specialty Pipe of all diameters can be ordered from a supply house cut to a convenient length that shall be at a minimum four (4") inches longer than its final fabricated length. Pipe so ordered will have a maximum of one (1) mill bevel, thread or groove. The other end shall have a machined or burned cut.

HVAC pipe, schedule 40 or heavier, 4 inches and under, can be ordered from a supply house in half-lengths grooved, beveled or threaded on both ends.

Section II. All combination sprinkler/standpipe systems exclusive of cross mains, stringers and fire hose stations and connecting pipe to same may be cut, threaded or grooved, in the shop of the direct employer or on the job at the option of direct employer. If the said shop is a permanent shop, equipped with permanently installed pipe cutting and threading machinery, then the work shall be done by a steamfitter working alone. When a direct employer has no permanently installed pipe cutting machinery in his shop, such work shall be done in accordance with Rule V on the job or in a shop employing steamfitters.

All fittings above 2” on sprinkler work may be made up in the shop of the direct employer by a Steamfitter working alone or on the job in accordance with Rule V, at the option of the employer. The makeup of fittings up to and including 2” in diameter can be ordered from any shop. Prefabricated flexible sprinkler heads not to

exceed twenty-four (24) inches are permissible.

All types of chemical fire protection systems are the work to be performed by journeymen steamfitters and/or apprentices.

Welded outlets on sprinkler mains with yellow labels shall be allowed in Nassau and Suffolk Counties.

Section III. All pipe fabrication performed in a shop under Sections I and II must be labeled before leaving the shop. The journeyman performing the work must attach a label to the pipe showing the journeyman's name, signature, book number, name and address of the shop and date when work was performed to demonstrate that such work was done by a journeyman steamfitter within this bargaining unit and under the terms of this Agreement. Reproductions of the journeyman's signature will not be acceptable.

Labels shall be obtained by written application to Local Union 638 from individual employers. These labels shall be delivered by the Union to the steamfitter in charge of each shop, and he shall be fully responsible for the proper distribution of these labels.

Section IV. Radiator branches, convector branches and coil connections shall be cut, threaded, welded, brazed, glued, soldered or any other method of joining shall be done on the job by hand or machine in accordance with Rule V or in the shop of the direct employer using a steamfitter working alone, or at the option of the contractor in a shop employing 638 steamfitters in accordance with Rule V. Where so specified by the engineer, fan coil units may be delivered to the jobsite with factory pre-piped valve packages.

Section V. The erection and assembly of all pipe hangers and the erection only of supports and manufactured or fabricated structural attachments for work covered by this Agreement is the work of the steamfitter and apprentice in accordance with Rule V. Back to back channels, tube steel, and back to back angle iron suspended from structural attachments may be cut and/or welded in the shop of the direct employer or on the job in accordance with Rule V.

All threaded hanger rods shall be cut on the job or in the shop of the direct employer. Where plain hanger rods are utilized, the cutting and threading of rods under three quarter inch will be done on the job or in the shop of the direct employer.

Section VI. Pipe of all diameters can be ordered from a supply house cut into pieces for ease of access or handling and delivered to the job site. Pipe so ordered will not be cut to sketch and will have a maximum of one (1) mill bevel, thread or groove. The other end shall have a machined or burned cut.

Section VII. All pipe used for temporary heat which has been cut in the shop or on the job and subsequently removed may be used again.

Section VIII. All disconnecting and dropping to the floor of temporary piping used in construction is the work of the steamfitter.

Section IX. Fire Stopping of uninsulated pipe is the work of the Steamfitter.

Section X. Geothermal Piping is the work of the steamfitter within the scope of their jurisdiction.

Rule X.
WELDING

Acetylene, electric, fusion or other forms of cutting or welding fabrication shall be done on the job or in a shop at the option of the Employer in accordance with the conditions as set forth herewith.

Section I. All welding fabrication except for electric power generating plant installations shall be done by a steamfitter working alone in the shop of the direct employer, or shall be done in accordance with Rule V either on the job or in any other shop employing Local 638 Steamfitters and/or Apprentices.

On electric power generating plant installations over 100 megawatts all welding fabrication eight (8") inches and over shall be done in the shop of the direct employer or any other shop employing Local 638 Steamfitters

and/or Apprentices using Steamfitters working alone or in any other pipe fabrication shop having a signed agreement with the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada. Welding fabrication six (6") inches and under shall be done in the shop of the direct employer using Steamfitters working alone or in accordance with Rule V either on the job or in any other shop employing Local 638 Steamfitters and/or Apprentices.

A direct employer is a contractor who bids on a job directly for a public or private letting agency. If a direct employer bids and wins a job for erection and fabrication, it shall be done in accordance with Section I.

Section II. All pipe fabrication performed in a shop under this Agreement must be labeled before leaving the shop. The journeyman performing the work must attach labels to the pipe showing the journeyman's name, signature, book number, name and address of the shop and date when work was performed to demonstrate that such work was done by a journeyman steamfitter within this bargaining unit and under the terms of this Agreement. Reproductions of the journeyman's signature will not be acceptable.

Labels shall be obtained by written application to Local Union 638 from individual employers. These labels shall be delivered by the Union to the steamfitter in charge of each shop, and he shall be fully responsible for the proper distribution of these labels.

Section III. The fabrication of van stone joints, the making of hammer welds, or the welding of boiler headers, street steam headers, circular coils, trombone coils, zigzag coils, trunk coils, double pipe refrigerating machine coils, atmospheric type condensers, absorbers, weak liquor coolers and rectifiers of refrigerating machines may be done by the employer without reference to any jurisdiction by Enterprise Association. All other pipe welding is to be performed by journeymen steamfitters.

Section IV. There shall be no exception to this Rule unless an employer makes a specific request on a specific job which must be submitted to the Board of Arbitration for review, prior to start of job. If approved by the Board of Arbitration, approval shall be for that job only and shall not prejudice this Rule on any other work.

Rule XI.
TEMPORARY SERVICES

Section I. Except as described in Section VII, Steamfitters working alone shall have jurisdiction in the operation and/or maintenance of all temporary heat work at all times whenever temporary heat is on a building regardless of the source of heat supply. If the fire is banked or if no heat is in the radiators, steamfitters shall have no claim for temporary heat operation and/or maintenance. Steamfitters shall have no claim for temporary heat operation and/or maintenance in any building or structure or addition thereto that will have a total of 1,500 sq. ft. of equivalent direct radiation or less, exclusive of mains and risers installed in said building or structure or addition thereto when completed.

Section II. Before the commencement of any temporary services for providing heating or air conditioning on a project utilizing systems installed under this agreement, a pre-temporary services conference shall be held, with the Owner/General Contractor/Construction Manager, the Contractor and appropriate Local 638 Business Agent to establish the basic guidelines, rules and procedures with regard to any temporary services requirements for the project. Said conference shall be held at such time as to give all appropriate parties ample time to provide those services needed.

Section III. Each steamfitter shall conform to the schedule of shifts provided for each job and shall report to his predecessor on the job at least fifteen (15) minutes before the shift changes and no fitter shall leave his shift until he is relieved. The steamfitters shall not do any other work and shall not be permitted to work more than one shift in a twenty-four hour day.

Section IV. The steamfitter on a shift shall meet any emergency arising to the best of his ability and with the object of protecting the interests of his employer.

Section V. It is agreed that when temporary services are required, that in the interests of security and safety, those people required to maintain temporary services shall sign in with an appropriate party and keep all necessary "logs".

Section VI. Temporary services, if required, shall be continued until such time as an Owner/General Contractor/Construction Manager provides the contractor a letter of acceptance for the mechanical system.

Section VII. When steamfitters employed by the mechanical contractor are present on the job during the regular working day, no temporary services steamfitter will be required.

Section VIII. All construction offices, engineers' offices, sales offices and finished model apartments on the floor are not subject to temporary air conditioning services.

Section IX. Before temporary services shall be terminated for a project, the Owner/General Contractor/Construction Manager must provide the Contractor with a letter stating that he accepts the mechanical system for the project and agrees to operate and maintain the mechanical system for the project.

Section X. When temporary air conditioning is required by an Owner/General Contractor/Construction Manager for hours other than normal temporary heat shift hours, then a minimum of two shifts will be required.

Section XI. The temporary services committee is established as a standing committee and will meet periodically to review any disputes in this area and will make recommendations to the Joint Trade Board.

Section XII. An employer will not engage a steamfitter on the above type heating maintenance or temporary air conditioning who cannot produce satisfactory evidence that the steamfitter has fifteen (15) years of experience.

Rule XII.
TOOLS AND SHANTIES

Section I. The Employer shall provide all necessary tools required for the steamfitter to perform the work. The steamfitter shall comply with all Employer rules and regulations in the use and care of these tools, and promptly report any that are missing, destroyed, or in need of repair. There should be no restriction on the use of tools or installation methods, except that, where required, proper certifications shall be provided by the contractor to the steamfitters.

Section II. The Employer shall provide suitable shanties for dressing facilities on all jobs. These shall be heated during winter months and window air-conditioners or similar shall be provided during the summer months. Where these are prefabricated for job assembly, they shall be job assembled by steamfitters.

Section III. In the event an employee's working clothes are destroyed by fire or water during other than working hours, the Employer shall compensate the employee for the replacement of these articles, but in no event shall the amount for replacement exceed Five Hundred ($500.00) dollars per employee. In the event personal property, including street or dress clothes of an employee, are destroyed due to fire or water, during working hours, the amount of damage shall be limited to Five Hundred ($500.00) dollars.

Rule XIII.
EFFICIENCY OF STEAMFITTERS
NO DISCRIMINATION

Inasmuch as greater efficiency is desirable, both parties will encourage efficiency and discourage any discrimination in employment of workers on the basis of age and unreasonable limitations on the amount of work a Steamfitter can do.

The parties agree not to discriminate on the basis of race, creed, color, national origin, sex, age, disability, marital status, sexual orientation or citizenship, with regard to employment, wages or other terms and conditions of employment.

Rule XIV.
DUTIES OF A STEAMFITTER

The duties of a Steamfitter shall be such as are described under the heading "Duties of a Steamfitter" in the agreement made and entered into by and between the United Association and the Enterprise Association, March 24th, 1914, and copy hereto attached.

Rule XV.
SHIFT WORK
(Existing Buildings – Occupied or previously occupied)

Section I. When work is performed, as in Rule II, Section IV, in existing buildings which are or have been occupied, shift work may be performed at the option of the employer Monday through Friday, in accordance with the following:

a) A shift shall consist of seven (7) working hours. All work performed in excess of seven (7) hours shall be paid at double the rate for regular time. No shift shall commence after 7:00 P.M. on Friday or 7:00 P.M. the day before Holidays. All work performed after 12:01 Saturday or 12:01 the day of a holiday will be paid at double the rate for regular time.

b) Starting time for each shift shall be designated by the Employer.

c) A steamfitter or apprentice who has worked during the same regular workday shall not be assigned to shift work.

d) The Employer shall notify the Union 24 hours prior to the start of shift work.

e) A steamfitter or apprentice shall not work more than one shift in a 24-hour period.

f) Pay for shift work shall be in accordance with Rule II, Section IV.

Rule XV-A
RIGGING

Steamfitters will do all rigging of their pipe-fittings-valves-equipment and all appurtenances and set all equipment when no license is required.

If a master rigging license is required by law and if the contractor who is party to this agreement holds a master riggers license and is the direct bidder or sub-contractor on the job, this work will be done by steamfitters.

If the said contractor has no license, steamfitters will work in composite crews with the trade holding the license when required by law. Once the equipment and appurtenances are landed on the floor and in a safe position, the steamfitters will move and set this equipment to its final destination. Truck deliveries will be taken from the sidewalk or truck dock by the steamfitter into the building.

There shall be no exception to this Rule unless an employer makes a specific request on a specific job which must be submitted to the Board of Arbitration for review, prior to start of job. If approved by the Board of Arbitration, approval shall be for that job only and shall not prejudice this Rule on any other work.

Rule XV-B.
SUB-CONTRACTING

1. All work covered under this agreement if sub-contracted, will be sub-contracted to a contractor signatory to this Agreement.

2. Any work that has been sub-contracted from signatories to this Agreement shall not be re-subcontracted.

3. It is the intent of this Agreement that sub-contracted work shall be all inclusive of labor, materials, tools, etc., required for this work and not be labor only contracts. Where testing, flushing, or chemical treatment is included in the prime contract then it shall be included in the subcontracted piping work.

4. The letting contractor shall notify the Fund Office, in writing, on a form provided by the Fund Office of his intent to sub-contract work. This notification must take place individually for each job subcontracted and before commencement of work by Local 638 members on the project being subcontracted. Effective January 1, 2022, Failure to properly notify the Fund Office may result in a penalty bond amount as per Rule XXIV. Local 638 or the Employer's Association may notify the Board of Arbitration of any failure by a letting contractor to properly notify the Fund Office. The Board of Arbitration shall review the complaint in a timely matter and may determine to require said employer to increase their bond. The maximum penalty bond required shall be quadruple the base bond amount required.

5. The contractor who opts to sub-contract will assure compliance of Rule XXIV of the Collective Bargaining Agreement.

6. The Fund Office shall notify the letting contractor and the Union if the sub-contractor becomes delinquent.

7. Fabrication sub-contracting shall be subject to Rules IX and X.

Rule XV-C.
DOUBLE BREASTING

To protect and preserve, for the employees covered by this agreement, all work they perform and all work covered by this agreement, and to prevent any device or subterfuge to avoid the protection and preservation of such work, it is agreed as follows:

If contractor performs on-site construction work of the type covered by this agreement, under its own name or the name of another, as a corporation, company, partnership, or other business entity, including a joint venture, wherein the contractor, through its officers, directors, partners, owners, or stockholders exercises directly or indirectly (including but not limited to management, control, or majority ownership through family members), management, control or majority ownership, the terms and conditions of this agreement shall be applicable to all such work. This rule is for a period commencing July 1, 2021 to June 30, 2022. This rule shall be evaluated by the joint trade board and can be extended for one (1) year periods if agreed to by the joint trade board (there shall be no arbitration to resolve any lack of agreement).

Rule XV-D
PUBLIC WORKS SUPPLEMENT

There is a separate Works Supplement applicable to any public works project (Federal, State, City) done under prevailing rate laws, and is applicable to HVAC and mechanical contracts with a dollar value not to exceed Thirty Million Dollars ($30,000,000) and to fire protection/sprinkler contracts with a dollar value not to exceed Three Million Dollars ($3,000,000) and to other projects subject to the approval of the Joint Trade Board. The Supplement is for a period commencing July 1, 2021 to June 30, 2022; the Supplement is to be evaluated by the Joint Trade Board and can be extended for one (1) year periods only if agreed to by the Joint Trade Board (there shall be no arbitration to resolve any lack of agreement).

If a job is bid under the Supplement then the terms of the Supplement remain in effect for that job until its completion. The second paragraph to Article X shall not apply to Supplement.

Rule XV-E
JURISDICTIONAL CLAIMS

The employer agrees to recognize the jurisdictional claims of Steamfitters Local 638 and of the United Association of Journeyman and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada ("United Association") that have been established in their Constitutions and By Laws, by agreements with other crafts, awards contained in the Green Book, or as a result of decisions by the National Joint Board for the Settlement of Jurisdictional Disputes, or its successor or which are recognized as being the jurisdiction of the United Association and Steamfitters Local 638 and further agrees to assign all such work to Steamfitters, to the extent the Employer has the ability to assign such work, subject to the 1914 Agreement, existing practices and

agreements, and future jurisdictional decisions.

Section I. The installation of all types of hydrogen piping and related equipment for production, transport, storage, power generation, comfort heating and cooling, industrial feedstocks, process heat, fuel cell production and transportation fuels.

Rule XVI.
SERVICE WORK

When an employer subscribing to this Agreement employs members of Refrigeration and Air Conditioning Service and Maintenance Mechanics, Metal Trades Branch of Local Union 638, to perform refrigeration, air conditioning, air cooling, stoker and oil burner service work, such work shall be performed in accordance with the terms of a Trade Agreement in effect between the Contractors' Association and the Metal Trades Branch of Local Union 638 described above.

Rule XVII.
SHOP STEWARDS

Where the Employer employs four (4) or more units (as defined in Rule V) of Enterprise Association members on a job, then the Union shall send the 7th member to the job to act as Shop Steward, or the business agent may appoint one of the members being sent to the job by an employer, after being notified by the employer, prior to the members being sent to job.

If a member is sent to the job by the Union he will be selected from a group of members who are both interested and qualified to be Shop Steward. Any such Shop Steward shall be a working steamfitter who shall act in behalf of the interests of the Union and whose duties shall not interfere with the work he is employed to perform by the Employer.

If there is a complaint presented against the member acting as Shop Steward, either by the contractor or the members on the job, it will be addressed by the Business Agent, Business Agent at Large and the President within three (3) days of receipt of the grievance.

If said complaint was made by the contractor and was not rectified, then there shall be a Pre Trade Board Committee Meeting on the issue within seven (7) days of preliminary hearings.

The Shop Steward and his partner will be the third (3rd) to last unit employed on the job site. If the appointed Shop Steward leaves a job voluntarily, then the members on that job will select a new Shop Steward from the steamfitters on the job.

When the Employer of a Shop Steward has three (3) or more units working overtime on the job where the Shop Steward is employed, the Shop Steward and his partner shall be included in one of the units working overtime.

The steamfitter in charge shall be the Shop Steward whenever there is no appointed Shop Steward on the job.

When the Union or MCA believe a MCA Contractor is in violation of the Trade Agreement by lumping, paying employees off the books, employing employees out of classification to perform work covered by the Trade Agreement, or performing work in violation of Rule XV-C, the Union or MCA shall contact the Shop Stewards Committee which shall consist of two (2) members from each Association. The Shop Stewards Committee shall decide whether the Union will have the right to send the third member to each job as Shop Steward for a period of one (1) year for that contractor. If no agreement is reached by the Shop Stewards Committee, the Union and MCA may forward the matter to the Joint Board of Arbitration for a decision, which Board shall then meet within two (2) days. The final determination by the Joint Board of Arbitration shall be final and binding and not subject to Arbitration.

The Employer agrees not to discriminate in any way against any person so designated as Job Steward, either due to his being designated or to his activities in behalf of Enterprise Association and members.

Rule XVIII.
WELFARE FUND

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay to the Steamfitters' Industry Welfare Fund eighteen dollars and fifty cents ($18.50) per hour for regular time as set forth in Rule I, and thirty-seven dollars ($37.00) per hour for overtime as set forth in Rules I and III for work performed by each journeyman steamfitter. Apprentices shall be paid in accordance with Rule II, Section III. These payments shall be made for work performed by them in the City of New York and in Nassau and Suffolk Counties, N.Y., before any deductions are made for withholding or other taxes. Such Fund was established by an Agreement and Declaration of Trust, dated May 15, 1946, to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

The Welfare Fund Trustees shall allocate from employer contributions to the Welfare Fund such amounts as they determine from time to time to establish accounts for participants in the Health Reimbursement Account Fund of the Steamfitters' Industry Welfare Fund. The Welfare Fund Trustees shall establish a ceiling on the amounts to be so allocated which shall initially be $5,000.

Rule XVIII-B
HEALTH REIMBURSEMENT ACCOUNT FUND OF THE STEAMFITTERS' INDUSTRY WELFARE FUND

The parties hereto agree to establish by an Agreement and Declaration of Trust, The Health Reimbursement Account Fund of the Steamfitters' Industry Welfare Fund ("HRA Fund"), which shall be a sub-trust of the Steamfitters' Industry Welfare Fund. The purpose of the HRA Fund is to provide reimbursement of medical care expenses to Steamfitters and Apprentices employed under the Trade Agreement, and their spouses and dependents. The HRA Fund shall be jointly administered by three (3) Employer Trustees and three (3) Union Trustees. The Fund Trustees are authorized to contribute to the account of a participant in the HRA Fund amounts previously contributed under Rule XVIII and allocated to the account of a Participant under a plan providing health benefits. The Fund Trustees are authorized to enter in an agreement with the Trustees of the Steamfitters' Industry Supplemental Retirement Fund to direct a portion of amounts to be paid to the Trustees pursuant to Rule XVIII (including amounts allocated to Participants in the HRA Fund in excess of $5,000) to be directed to the Steamfitters' Industry Supplemental Retirement Fund. Any such agreement shall only apply to amounts paid subsequent to such agreement. Any such amount shall be considered an amount which was directly contributed to the Steamfitters' Industry Supplemental Retirement Fund.

Rule XIX.
PENSION FUND

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay to the Steamfitters' Industry Pension Fund twelve dollars and eighty-five cents ($12.85) per hour regular time as set forth in Rule I and twenty-five dollars and seventy cents ($25.70) per hour for overtime as set forth in Rules I and III for work performed by each journeyman steamfitter. Apprentices shall be paid in accordance with Rule II, Section III. These payments shall be made for work performed by them in the City of New York and in Nassau and Suffolk Counties, N.Y., before any deductions are made for withholding or other taxes. Such Fund was established by an Agreement and Declaration of Trust dated November 1, 1950, to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Rule XIX-B.
SUPPLEMENTAL RETIREMENT PLAN

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay to the Steamfitters' Industry Supplemental Retirement Plan seven dollars and fifty-five cents ($7.55) per hour regular time as set forth in Rule I and fifteen dollars and ten cents ($15.10) per hour for overtime as set forth in Rules I and III for work performed by each journeyman steamfitter. Apprentices shall be paid in accordance with Rule II, Section III. These payments shall be made for work performed by them in the City of New York and in Nassau and Suffolk Counties, NY, before any deductions are made for withholding or other taxes. Such Fund was established by an Agreement and Declaration of Trust dated January 24, 1997, to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement to be amended in accordance with its terms.

Rule XX.
EDUCATIONAL FUND

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay to the Steamfitters' Industry Educational Fund seventy-four (.74) cents per hour for each and every hour worked by journeymen and apprentice steamfitters employed in the City of New York, Nassau and Suffolk Counties, N.Y. Apprentices shall be paid in accordance with Rule II, Section III. Such Fund was established under date of August 14, 1952 and by Agreement and Declaration of Trust, dated May 1, 1960 to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Each apprentice will attend class for eight (8) hours on one (1) day every other week in compliance with the requirements of said Educational Fund and the employer of each such apprentice will pay to the apprentice who attends such classes for the requisite eight (8) hours, a total of seven (7) hours of wages and fringes based on the corresponding percentages due to such apprentice as stated in Rule II, Section III.

Rule XXI.
VACATION PLAN

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay to every journeyman steamfitter employed by them an additional wage in the sum of seven dollars ($7.00) per hour regular time as set forth in Rule I and fourteen dollars ($14.00) per hour for overtime as set forth in Rules I and III. Apprentices shall be paid in accordance with Rule II, Section III. This additional wage, less any requisite withholdings or deduction therefrom as required by law, shall be paid to the Trustees of the Steamfitters' Vacation Plan to be established for the account of the respective steamfitter or apprentice and in accordance with the appropriate rules and regulations to be established by such Trustees; which payments shall be disbursed by said Trustees only to the steamfitter or apprentice with respect to whom such payments have been made (less actual expense of formulating and administering the trust) as a vacation payment to said steamfitter or apprentice, and in accordance with such rules and regulations as may be adopted by the Trustees in furtherance of the objectives set forth in this rule.

Such Plan was established by an Agreement and Declaration of Trust dated July 1, 1953, to which the Contractors' Association and Enterprise Association were parties and all Employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Plan, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Rule XXII.
SECURITY BENEFIT FUND

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay into the Steamfitters' Industry Security Benefit Fund which was established by an Agreement and Declaration of Trust dated September 1, 1961 as a trusteed fund jointly administered in compliance with law the sum of eleven dollars and twenty-five cents ($11.25) per hour regular time as set forth in Rule I and twenty-two dollars and fifty cents ($22.50) per hour for overtime as set forth in Rules I and III for work performed by each journeyman. Apprentices shall be paid in accordance with Rule II, Section III. Said sums less actual expenses of administering the trust shall be held by the Trustees of said Fund for the benefit of the steamfitter or apprentice with respect to whom such payments have been made and applied in accordance with such plan as may be adopted by the Trustees. Such plan shall qualify under applicable provisions of the Internal Revenue Code to insure deductibility of said payments from taxable income of the employer.

Such Fund was established by an Agreement and Declaration of Trust, dated September 1, 1961, to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Rule XXIII.
INDUSTRY PROMOTION FUND

Every employer shall during the term of this Agreement pay one percent (1%) per hour of the journeyman steamfitter wage rate less fringe benefits to the Steamfitting Industry Fund of New York and Long Island for each and every hour worked by journeymen and apprentice steamfitters for work performed by them in the City of New York and in Nassau and Suffolk Counties, NY. Such Fund was originated by an agreement dated July 6, 1966, to which the Contractors' Association and Enterprise Association were parties. Such Fund was established by a Declaration of Trust, dated September 30, 1966, and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all provisions of said Agreement and Declaration of Trust.

Rule XXIII-A.
LABOR-MANAGEMENT COOPERATION COMMITTEE

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay into the Labor-Management Cooperation Committee, which was established by an Agreement and Declaration of Trust dated July 1, 2008 as a trusteed fund jointly administered in compliance with law the sum of four cents ($0.04) per hour worked as set forth in Rule I for work performed by each journeyman. Said sums less actual expenses of administering the trust shall be held by the Trustees of said Committee for the benefit of the industry.

Such Fund was established by an Agreement and Declaration of Trust, dated July 1, 2008, to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Rule XXIII-B.
UNITED ASSOCIATION TRAINING FUND

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay into the United Association Training Fund the sum of ten cents ($0.10) per hour worked as set forth in Rule I for work performed by each steamfitter.

Rule XXIV.
BONDING AND FUND PAYMENT REQUIREMENTS AND ADMINISTRATION

The below bonding and fund payment requirements and administration procedures shall be effective January 1, 2022. For requirements in effect through December 31, 2021, please refer to the prior Local 638 Steamfitters Collective Bargaining Agreement.

Section I. Each Employer shall furnish a bond or an equivalent amount in cash to the joint benefit of the Trustees of the Steamfitters' Industry Welfare Fund, the Steamfitters' Industry Pension Fund, the Steamfitters Supplemental Retirement Plan, the Steamfitters' Industry Educational Fund, the Steamfitters' Industry Vacation Plan, the Steamfitters' Industry Security Benefit Fund, and the Steamfitting Industry Fund of New York and Long Island, including the guarantee to the Steamfitters' Industry Fund of wages paid by check (the "Funds"), guaranteeing payment to said Trustees, jointly and severally, of any and all amounts due from said Employer to each or all of the Funds, pursuant to the terms of this Agreement.

Such bond shall be in form and substance, and shall be issued by a surety, satisfactory to the said Trustees, jointly. Such bonds shall provide that the counties of New York and Nassau and Suffolk are proper venue.

The aggregate amount of the base bond shall be determined by the following:

0 to 6	Local 638 Employees	$60,000.00
7 to 14	Local 638 Employees	120,000.00
15 to 30	Local 638 Employees	170,000.00
31 to 60	Local 638 Employees	450,000.00
Over 61	Local 638 Employees	750,000.00

Section II. Each Employer will make the required Fund payments provided for in this Agreement within fourteen (14) calendar days following the close of the work week, i.e., for a work week ending on Tuesday, the Fund payments must be received by the Fund Office no later than the second following Tuesday except where Trustees have, in writing, authorized or directed other terms; with respect to any payments not made within the required time, an Employer will pay interest at 16 percent (16%), or the maximum rate, if any, fixed by Section 5-501 of the New York General Obligations Law (hereinafter "the Maximum Rate of Interest") from the date due, and, as liquidated damages, an additional amount equal to 20% of the unpaid contributions as determined by a court of competent jurisdiction, and will reimburse the Funds for the reasonable expense of collection including attorneys' fees and audit fees. In the event that an Employer is delinquent fourteen days after written notice of delinquency addressed to the Employer has been deposited in the U.S. mail by certified mail, return receipt requested, the said Employer shall be required thereafter for the remaining term of this Agreement to furnish a bond for double the amount required in Section I, and if the said Employer is thereafter delinquent at any time during the term of this Agreement of twenty-eight days after written notice of delinquency addressed to the said Employer has been deposited in the U.S. mail by certified mail, return receipt requested, the said Employer shall be required thereafter for the remaining term of this Agreement to furnish a bond for quadruple the amount required in Section I. In the case of delinquency, the maximum bond shall be quadruple the base bond amount required. The Trustees may, in their sole discretion, accept or require a personal bond, certified check, or guarantee of payment of one or more stockholders or officers of the Employer in lieu of the additional amounts which may be required of an Employer pursuant to this paragraph.

Application for such less frequent payments must be made in writing by the Employer and shall, upon approval, require a bond for double the amount required in Section I but in no case shall the base bond be more than $750,000.00. Such less frequent payments are described as monthly. Payment must be made within fifteen (15) calendar days following the close of the prior work month. If said employer has not remitted payment of funds for the prior month by the 15th of the following month, he shall be considered delinquent.

The Trustees, acting through Chairman and Co-Chairman or a sub-committee of Trustees designated by them, or the Administrator, have the authority to direct, in writing, an Employer that is unbonded and/or on the delinquency list more than three (3) times during the term of this Agreement to make its payments to the Funds within three (3) calendar days from the close of the work week, i.e., for a work week ending on Tuesday, the Fund payments must be received by the Fund Office no later than the Friday of the same calendar week. The

Trustees, as to any Employer so required to make Fund payments within three (3) days, may initiate arbitration and/or any other remedy available to them, at any time after the third calendar day from the close of the work week, without further notice. In addition, where a contractor is unbonded and/or on the delinquency list more than three (3) times during the term of this Agreement and/or issues a check to the Funds which is returned "unpaid for insufficient funds," "uncleared funds" or as to which the Employer stopped payment, the Trustees, through Chairman and Co-Chairman or a sub-committee of Trustees designated by them, have the authority to direct an Employer to make Fund payments by means of Certified Check, Bank Check, or Money Order. Any Employer that fails to meet a three (3) day payment schedule that may be directed pursuant to this Paragraph, and/or fails to pay by Certified Check, Bank Check or Money Order when so directed, shall be deemed delinquent within the meaning of Rule IV, Section II, and the Union may refuse to permit employees to work for such Employer.

Reporting of Fund payments by employee's name shall be submitted at the same time as payments are due.

In addition to any other action the Funds may be empowered to take, the Funds may bring an action pursuant to Sections 502 (G) (2) and 515 of the Employee Retirement Income Security Act of 1974, as amended, to enforce the Employer's obligation to make contributions. In any action under the preceding sentence in which judgment is awarded in favor of the Funds, such judgment shall award the Funds: the unpaid contributions, and interest at the Maximum Rate of Interest, and as liquidated damages an amount equal to 20 percent of the said unpaid contributions as determined by the court, and reasonable attorney's fees, audit fees and costs of the action, and such other legal or equitable relief as the court deems appropriate. Nothing in the foregoing two sentences shall be construed as a waiver or limitation on the Funds' or the Trustees rights to enforce an Employer's obligation to contribute in any other type of proceeding against the Employer and/or its shareholders and/or its officers.

In the event an Employer is delinquent hereunder as defined in Rule IV, Section II, the Funds, in their sole discretion, may initiate arbitration proceedings to obtain appropriate relief. The parties specifically agree that any claim made by the Funds based upon any such delinquency may be initiated by the Funds upon fourteen (14) days written notice of intention to arbitrate by registered mail or certified mail to the last address of the employer on record with the Fund Office, and to Roger Maher, as Arbitrator, or such other Arbitrator as the Board of Arbitration may from time to time select, to be settled by arbitration in accordance with the Voluntary Labor Arbitration Rules of the American Arbitration Association, except as otherwise provided herein and judgment upon the award rendered by the Arbitrator may be entered in any court having jurisdiction thereof and shall be final and binding upon the parties. Should the Employer fail to appear, together with his payroll records for the period of delinquency in question, the Arbitrator may find against the Employer by default. In any case in which the Arbitrator finds that the employer is indebted to the Funds, the award shall include: the unpaid contributions, and interest on unpaid or tardily paid contributions at the Maximum Rate of Interest; and as liquidated damages an amount equal to 20% (twenty percent) of the unpaid contributions as well as any sums due pursuant to Section IV of this Rule; and reasonable attorney's fees, audit fees and costs of collection, and such other legal and equitable relief as the Arbitrator deems appropriate. It is specifically agreed by the Employer that in any case in which the Funds serve a notice of intention to arbitrate (or demand for arbitration) which results in a notice of hearing being issued by the Arbitrator, contributions for all weeks which are claimed as due by the Funds as of the notice of intention to arbitrate as well as contributions for all weeks claimed as due by the Funds through the date of the arbitration hearing or adjourned date, if any shall be subject to such arbitration. Once the notice of the hearing is issued, payment of the sums claimed in the notice of intention to arbitrate and all sums claimed as becoming due thereafter in accordance with the preceding sentence, will not be deemed to have been made until the Fund Office receives such sums in the form of cash, certified check, or an uncertified check which the Fund Office determines has cleared prior to the arbitration hearing; the Fund's judgment as to the time of clearing of a check shall be conclusive. An Employer to whom a demand for arbitration has been mailed shall pay cancellation fee for legal, administrative and/or arbitration costs as follows: if all fringe benefits claimed in the demand for arbitration are paid, with interest, prior to the arbitrator mailing a notice of hearing, the cancellation fee is TWO HUNDRED DOLLARS ($200); if the notice of hearing has been issued by the arbitrator, and all fringe benefits claimed by the Funds as due as of the date of hearing have been paid, with interest, the cancellation fee is FOUR HUNDRED DOLLARS ($400), if paid more than twenty-four (24) hours prior to the scheduled starting time of the hearing and SIX HUNDRED DOLLARS ($600) if paid prior to, but less than twenty-four (24) hours before the scheduled starting time of the hearing. Initiation of the aforesaid arbitration procedure shall not preclude the Funds from pursuing any other remedy or remedies available to them including other remedies against the Employer and/or its officers and/or its shareholders. It is expressly understood and agreed that the arbitration provision herein shall not be an exclusive remedy.

At the option of the Funds, suit may be brought by the Funds against the Employer (a) in the Southern District or Eastern District of New York in the case of Federal court action by the Funds, or (b) in the courts of the State of New York, in which event the Counties of New York or Nassau are deemed proper venue, and the law of the State of New York shall apply except that federal law shall apply as to the remedies available through arbitration. It is agreed that the Funds may sue collectively or individually in their own name or, alternately, in the name of the Administrator and at least one Employer Trustee and one Union Trustee from each of the Funds.

The Funds, in their own name or, alternatively, in the name of the Administrator and at least one Employer Trustee and one Union Trustee from each of the Funds, may file mechanic's liens on behalf of each and every employee who works under this Agreement, with respect to any contribution due such employee and not paid in accordance herewith.

Section III. Each Employer who chooses to exercise the option of paying wages by check, as provided in Rule IV of this Agreement, shall, after receiving the required approval of the New York State Labor Commissioner, file a copy of such approval with a written request for permission to pay by check with the Board of Arbitration with the consent by the Employer Association, the Board of Arbitration will, alone, make such determination. The Board of Arbitration shall withhold approval from any Employer who has been delinquent in any wage or Fund payments during the preceding twelve months. The Board of Arbitration will recommend to the Steamfitters' Industry Fund Trustees, the name of such qualified Employer and after written approval by the Steamfitters' Industry Fund Trustees, the Employer may commence paying by check.

An Employer whose check for wages fails to clear in due course agrees forthwith to pay to the Steamfitting Industry Fund of New York and Long Island Trustees the face amount of such check together with interest at the Maximum Rate of Interest per annum from the date said Trustees paid such sum on behalf of the Employer together with the reasonable expense of collection.

Section IV. The Trustees may at any time direct a payroll audit of any Employer to verify the Fund payments. Failure by any Employer to permit such audit within a reasonable time from receipt of written demand by the Fund Office, mailed to the Employer by registered mail, return receipt requested, to conduct such audit, or to submit the reports of payments due to the Fund Office in accordance with the requirements of this Rule XXIV, shall constitute a breach of this Agreement and the rules attached for which Employer shall be liable to the Funds for liquidated damages in the sum of $500 per day for each day of delay in permitting such audit beyond the said 10 days, or in submitting the said reports in accordance with the Rule XXIV.

The Trustees shall notify the appropriate Enterprise Association officials of all delinquent Employers, including Employers who are not in compliance with the bonding, auditing and reporting requirements hereof, for action as provided for in Rule IV. All bonds furnished under this Rule shall provide for the bonding of the Employer's obligation to pay the Maximum Rate of Interest per annum of any delinquent Fund payments or wages and for the reasonable expense for collection including liquidated damages, audit fees and attorney fees in addition to the principal amount.

Rule XXV
Health & Safety Committee

By the Parties agreeing to this section, they expressly waive the provisions of the New York Health and Essential Rights Act (commonly referred to as the "Hero Act"). The Union and MCA shall meet as needed to discuss health and safety topics relevant to the industry, and where necessary, shall disseminate information and best practices to the industry.

AGREEMENT

ARTICLE I
FURNISHING ALL STEAMFITTERS REQUIRED

On this 1st day of July, 2021 it is hereby agreed between the Mechanical Contractors Association of New

York, Inc., hereinafter referred to as "Contractors' Association" and the Enterprise Association of Steam, Hot Water, Hydraulic, Sprinkler, Pneumatic Tube, Ice Machine and General Pipe Fitters of New York and Vicinity, Local Union No. 638, of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, hereinafter referred to as "Enterprise Association", that the Enterprise Association shall enforce all the foregoing Rules and shall furnish to the members of the Contractors' Association all the competent steamfitters and apprentices which they demand through the Contractors' Association and that in consideration thereof the members of the Contractors' Association will, in the employment of steamfitters and apprentices, observe the Rules of the Enterprise Association within the territory to which they apply as set forth in the copy of same hereto attached. No other Rules shall apply during the life of this Agreement.

ARTICLE II
LIST OF MEMBERS

It is further mutually agreed that the Contractors' Association within sixty (60) days after the signing of this Agreement will furnish the Enterprise Association a list of its members and will notify the Enterprise Association of any changes that take place in said list of members every month. A correct list of members of the Enterprise Association shall be furnished to the Contractors' Association within sixty (60) days after the signing of this agreement and the Enterprise Association shall each month notify the Contractors' Association of changes that take place in said list of members.

ARTICLE III
STRIKES AND LOCKOUTS

It is further mutually agreed that no strike against any member or members of the Contractors' Association shall be ordered by any officer of Enterprise Association or entered into by any member of the Enterprise Association nor shall any lockout against members of the Enterprise Association be declared by the Contractors' Association, so long as this Agreement and the rules hereto attached are conformed to by both parties.

ARTICLE IV
BOARD OF ARBITRATION

It is further mutually agreed that a Permanent Board of Arbitration shall be established; the said Board to consist of ten (10) members, five (5) members of the Contractors' Association and five (5) members of Enterprise Association.

ARTICLE V
INELIGIBLE MEMBERS

It is further mutually agreed that no member of the Board of Arbitration shall sit on any matter in which such member is an interested party.

ARTICLE VI
DUTIES OF BOARD OF ARBITRATION

Section I. It is further mutually agreed that the question, matters and complaints, which shall be presented to the Board of Arbitration for decision, shall be as follows:

All alleged violations of this Agreement or the Rules attached.

The determination of the true intent and meaning of any part of this Agreement or the Rules.

The making of a new agreement to supersede this Agreement at its termination.

Any other matter which may, by mutual agreement, be referred to the Board.

The Board of Arbitration shall meet monthly (unless mutually agreed unnecessary) to consider the probable number of steamfitters which shall be required in the near future to carry on the work of the members of the Contractors' Association.

Section II. The Board of Arbitration shall meet within two (2) weeks after the execution of this Agreement and shall select a permanent Arbitrator, who shall serve for one year. The Board shall select a new Arbitrator or renew the term of the Arbitrator for subsequent one year terms. All new appointments or reappointments shall be

made no more than 60 days nor less than 30 days prior to the end of the term. Should the appointed Arbitrator be unable or fail to act, the Board, by vote may vacate the appointment and shall make a new appointment within two (2) weeks.

If the Board of Arbitration fails to agree on any appointment within the time stated herein, they may, by agreement, extend the time for such appointment. However, if such time extension is not agreed to, each Association shall select an Umpire and the two (2) Umpires shall within two (2) weeks select the Permanent Arbitrator.

ARTICLE VII
PROCEDURE OF BOARD OF ARBITRATION

Section I. It is further mutually agreed that in case any of the Rules or Agreements are violated by either of the parties to this Agreement, or by any of its members, then no strike, work stoppage or lockout against any member or members of either of the associations shall be instituted by either association without first submitting the grievance or question at issue to the Board of Arbitration.

Prior to the alleged violation being filed by either party the following procedure will be adhered to: the charging party will notify in writing the Secretary of their respective association of the alleged violation within ten (10) working days of the alleged occurrence of a violation. A meeting will be scheduled between both associations within thirty (30) days, unless otherwise mutually agreed. Attending this meeting will be both interested parties and a subcommittee consisting of two (2) Trade Board representatives from each association. If the dispute cannot be resolved, it will then be formally submitted to the full Board of Arbitration for discussion.

The first meeting of the Board of Arbitration shall take place within fifteen (15) working days after notification in writing from the Secretary of the Association having a grievance, unless otherwise mutually agreed. When a decision is reached by the Board of Arbitration upon any matter submitted to it, the said decision shall be final and binding on both parties. Any subsequent action of either Association shall in no way alter or nullify the effect of said decision, nor shall said decision be abrogated by either Association without the consent of the Board of Arbitration.

If the Employer fails to attend the sub-committee meeting described in Section I, second paragraph, or if it fails to attend a meeting of the full Board of Arbitration referred to in Section I, third paragraph, the sub-committee or the full-committee, as the case may be, may issue a decision by default. If the subcommittee declines to issue a written decision in an instance when the employer fails to appear, the full committee shall then meet. If the employer fails to appear at the full committee meeting and the committee fails to render a decision, the union may seek appointment of an arbitrator.

Each Association shall have one (1) vote.

The Rules and Regulations of the Joint Arbitration Board for the Conduct of Grievances Pursuant to Article VII shall prevail and a copy of said rules shall be provided upon request.

Section II. Should the Board of Arbitration fail to agree after three (3) consecutive meetings, except as to interpretation of the Agreement of March 24, 1914, hereto attached, said Board of Arbitration shall within two (2) days refer the dispute to the Arbitrator, and each side shall make its argument before the Arbitrator, who shall within two (2) working days thereafter render his decision, and said decision shall be final and binding upon both parties hereto.

ARTICLE VIII
JOINT ARBITRATION PLAN

It is further mutually agreed that both parties to this Agreement shall abide by a Joint Arbitration Plan that may be agreed upon by representatives of the several employers' associations and a majority of the unions of the building trades of New York City.

It is mutually agreed between the parties hereto that in event of disputes between trades, and disputes relative to question of jurisdiction of trade, the parties will abide by previous decisions as to jurisdiction published in the latest issue of the B.T.E.A. Handbook, commonly known as "The Green Book."

It is mutually agreed between the parties hereto that disputes between trades, and disputes relative to

jurisdiction of trade not covered by decision in the latest issue of the B.T.E.A. Handbook, commonly known as "The Green Book", shall be adjusted in accordance with the principles of the New York Plan for the Settlement of Jurisdictional Disputes as set forth in the Joint Arbitration Plan of the New York Building Trades as adopted on July 9, 1903, and amended on April 22, 1905, and as thereafter amended, except to the extent that Section 3 of the said Joint Arbitration Plan requires the employer to employ only members of the union directly or indirectly through subcontractors or otherwise.

Pending determination of any dispute under the New York Plan for the Settlement of Jurisdictional Disputes as stated in the preceding paragraph the members of the Union shall remain at work on the project without change in status.

ARTICLE IX
TERM OF THIS AGREEMENT

It is further mutually agreed that no change in this Agreement shall be asked for by either party hereto, to take effect prior to the first day of July 2023 and not then unless notice by the Association asking for such change is given to the other Association on or before the 31st day of January next preceding the first day of July 2023. Such notice shall be given in writing by Secretary of one Association to Secretary of the other Association, and shall state specifically all changes desired, and written receipt therefore shall be evidence of such notice.

In case no notice is served by either Association on or before January 31, 2023 then this Agreement shall continue in effect from year to year with right reserved for either party to serve notice on or before any 31st day of January in any year for any desired change to take effect on the following first day of July.

ARTICLE X

It is understood and agreed that this Agreement is based upon the Principles for Trade Agreements as set forth in the printed annex to this Agreement, and nothing in the Rules of the Enterprise Association attached hereto, or within this Agreement, shall be interpreted to contradict or nullify any of the said Principles.

It is agreed that if Enterprise Association furnishes Steamfitters to anyone upon more favorable terms or conditions than those contained herein, then this Agreement shall automatically be amended to incorporate such more favorable terms or conditions.

It is understood and agreed that in case any provisions of this Agreement shall be found to be contrary to law, such finding shall not in any way affect the other provisions of this Agreement, which shall, notwithstanding, continue in full force and effect, and the parties shall within ten (10) days after receipt of written notice by one party from the other, negotiate in an attempt to arrive at an appropriate substitute provision in light of such ruling.

In the event of change of applicable Federal laws affecting this Agreement, by virtue of which change it shall become legal for the Enterprise Association to demand that only members of Enterprise Association be employed in the performance of work under its jurisdiction, or to institute what is commonly known as the "closed shop", the Contractors' Association agrees that in such event and on the giving of ten (10) days’ notice to the Contractors' Association by Enterprise Association in writing by registered mail, this Agreement shall be deemed amended to the end that on and after the conclusion of the said ten (10) day period only members of the Enterprise Association shall be employed by the Contractors' Association in their performance of work coming within the jurisdiction of Enterprise Association and only members of the Metal Trades Branch of Local Union 638 shall be employed in the performance of service work more particularly described in Rule XVI of this Agreement.

For the Enterprise Association of Steam, Hot Water, Hydraulic, Sprinkler, Pneumatic Tube, Ice Machine, and General Pipe Fitters of New York and Vicinity, Local Union 638 of the United States and Canada

Local 638 Trade Board

Patrick Dolan

John Gruter

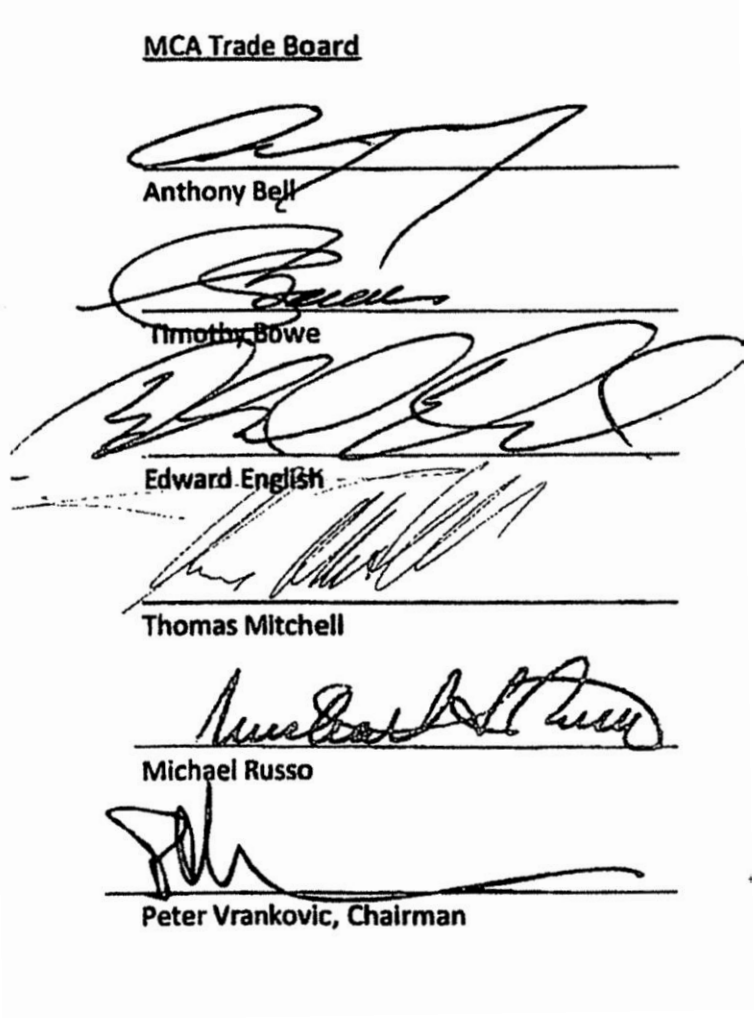
Brian Hart

Daniel Mulligan

Michael Mulvaney, Chairman

Joseph Welsh

For the Mechanical Contractors Association of New York, Inc.



**UNITED ASSOCIATION OF PLUMBERS
AND STEAMFITTERS OF
UNITED STATES AND CANADA**

To Whom It May Concern:

On March 24th, 1914, agreement was made between the United Association of Plumbers, Steam Fitters and Steam Fitters' Helpers of the United States and Canada and the Enterprise Association of Steam, Hot Water, Hydraulic, Sprinkler, Pneumatic Tube, Ice Machine and General Pipe Fitters of New York and Vicinity, and the Progress Association of Steam, Hot Water and General Pipe Fitters' Helpers of New York and Vicinity, which resulted in the admission of the above-mentioned Enterprise and Progress Associations into the aforesaid United Association of Plumbers, Steam Fitters and Steam Fitters' Helpers of the United States and Canada, which agreement entitles the aforesaid Enterprise and Progress Associations to all constitutional rights and privileges of the United Association.

This agreement provides and is so understood that the Enterprise Association, known additionally as Local Union No. 638 of the United Association, shall have jurisdiction over all steamfitters in the City of New York, and that the Progress Association, known additionally as Local Union No. 639 of the United Association, shall have jurisdiction over all steamfitters' helpers in the City of New York and such other territory as may be hereinafter referred to.

It is understood, and contained in the terms of the agreement referred to, that the Enterprise Association and the Progress Association shall have territorial jurisdiction over such territory as is contained in the City of New York, all of Long Island and such other adjacent territory as may hereafter be agreed upon between the said Enterprise and Progress Associations and other Local Unions of the United Associations in the vicinity of New York City.

It is further understood and agreed that the said Enterprise and Progress Associations shall continue to observe all terms and conditions of agreements now existing between said Enterprise and Progress Associations and any employer or employers' association, without objection or interference on the part of the United Association of Plumbers, Steam Fitters and Steam Fitters' Helpers of the United States and Canada, or of any Local Union or Local Unions thereof.

It is understood and agreed that the members of the Enterprise and Progress Associations while working for employers located in the City of New York, shall, without hindrance, be privileged to work at the Steam Fitting trade in the counties of Hudson, Essex, Union, Bergen and Morris, in the State of New Jersey, and at the trades of Steam Fitting and Sprinkler Fitting in the County of Westchester, State of New York, without depositing clearance cards in the usual manner.

Members of regularly constituted United Association Locals, while working for employers located in the aforesaid New Jersey territory, and the county of Westchester, State of New York, shall have a reciprocal privilege as to the City of New York, provided such members receive a scale of wage prevailing in the City of New York.

The following plan of trade jurisdiction as indicating the work of a steamfitter and a steamfitters' helper is hereby accepted by the United Association through its general board of officers, and by the Enterprise Association and Progress Association.

DUTIES OF A STEAMFITTER

(1) Wherever any apparatus, utensil or appurtenance erected or installed by the steamfitter shall require a connection from the water supply of the building, or from any piping erected by the plumber, such supply or waste connection shall be made by the steamfitter. The plumber shall leave in the water supply piping and in the waste or sewer piping, suitable outlets, at practical and convenient points, and the steamfitter shall run all necessary piping from such outlets to the apparatus erected or installed by him and from such apparatus to such outlets.

Piping of every description, together with its accompanying fittings, valves and appurtenances (excepting, only, air piping for thermostatic valves) which joins together the several parts of apparatus erected or installed by the steamfitter, in accordance with the jurisdiction of a steamfitter as herein described, including by-passes, shall

be erected, installed and connected by the steamfitter, and this regardless of whether such piping conveys steam, water air-brine ammonia, oil or other liquids or any commercial product or any product in course of manufacture.

(2) All steam, pneumatic and hydraulic poser piping other than the piping for thermostatic valves.

(3) All steam and hot-water heating apparatus and all steam boilers connected to hot-water heating apparatus and all steam boilers connected to hot-water tanks.

(4) All heat regulating systems, excepting piping for thermostatic valves.

(5) All vacuum heating systems are the work of the steamfitter. All vacuum cleaning systems are the work of the plumber, provided, however, that same does not include any form of piping for cleaning electrical and other apparatus and machinery as provided for in paragraph No. 10.

(6) All pneumatic tube systems.

(7) All ice-making, refrigerating and cooling apparatus of every description. This does not include piping for transmitting ice water for drinking purposes.

(8) All hydraulic piping for elevator, and for the operation of curtains, presses and machinery.

(9) All oil piping in connection with power or heating apparatus, provided, however, that piping used for the transmission of liquid gasoline in garages, dye houses and cleaning establishments shall be the work of the plumber.

(10) All air piping for power work, cleaning of electrical and other apparatus and machinery.

(11) Placing, erecting and testing of all fan coils, humidifiers and air washers in connection with heating and ventilating apparatus and connecting together the parts thereof.

(12) Setting of all fixtures, pumps, tanks and heaters in connection with steam power apparatus or with steam or hot water heating apparatus.

(13) All steam connections for hot water tanks shall be the work of the steamfitter. The employees of the contractor furnishing the tank shall place it with all necessary hangers or supports and the plumber shall make all water connections to the tank.

Hot water tanks and heaters for domestic purposes, which have no steam connections, shall be installed by the plumber.

(14) All air piping for window or door opening devices or for switch or signal system or for like purposes.

(15) Building and repairing of water grates for power or heating.

(16) All sprinkler systems including all fire stand-pipes connected thereto shall be installed, complete, by the steamfitter, excepting, only, that the plumber shall set the meter and do all piping from the meter to the water supply main in the street.

(17) All fire stand-pipes not connected with the sprinkler system, nor with the water supply of the sprinkler system, shall be the work of the plumber.

(18) All steam and return connections of all kitchen utensils.

(19) All steam ejectors and all piping in connection therewith.

(20) All piping for the transmission of glucose, syrup, liquid sugar, ink or other liquids in manufacturing or commercial plants or for the transmissions of such other commodities as pass through piping from one point to another in manufacturing or commercial plants, when such liquids or commodities are part of the product of such plants, and all piping utilized for railings and racks and similar piping shall be the work of either the steamfitter or the plumber, provided, however, that pipe railings in engine rooms and boiler rooms shall be the work of the steamfitter.

In all matters as to which decisions have, heretofore, been rendered by the Arbitration Board of the New York Building Trades, such decisions shall govern the jurisdiction of the plumber and steamfitter.

Representing the United Association of Plumbers and Steamfitters of the United States and Canada:

JOHN R. ALPINE,

General President

THOMAS E. BURKE,
General Secretary-Treasurer

E.W. LEONARD,
General Organizer

THE PRINCIPLES FOR TRADE AGREEMENTS

As referred to in Article X of the agreement dated July 1, 2021 between the Mechanical Contractors Association of New York, Inc., and the Enterprise Association of Steam, Hot Water, Hydraulic, Sprinkler, Pneumatic Tube, Ice Machine and General Pipefitters of New York City and Vicinity, Local Union No. 638 of United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada.

PRINCIPLES UPON WHICH TRADE AGREEMENTS SHOULD BE BASED

1. There shall be no strikes or lockouts or stoppage of work, neither shall members of a union collectively leave the work of a member of the Building Trades Employers' Association. Trade agreements made by the Employers' Associations, members of the Building Trades Employers' Association, and trade unions shall provide that all disputes arising in the trade shall be settled by trade boards of arbitration, with an umpire if necessary, and the decisions of trade boards and umpires shall be final and binding.

2. There shall be no agreement providing for discrimination against building materials, raw or manufactured.

3. The amount of work a man may perform shall not be restricted by a union nor by the representative, officers or members of a union; and the use of machinery, tools, appliances or methods shall not be restricted or interfered with.

4. The employer shall be at liberty to employ and discharge whomsoever he sees fit; and the members of the unions shall be at liberty to work for whomsoever they shall see fit.

5. The foreman shall be the agent of the employer and shall not be tried for any of his acts as foreman without due notice of the trial, accompanied by a written statement of the charges against him, being given to the Joint Trade Board.

6. The trade associations and unions shall jointly maintain a system which will provide an adequate force of skilled mechanics. The Apprenticeship Plan of the New York Building Congress is endorsed.

7. Overtime shall not be worked, except when unavoidable.

8. There shall be no provision, in any trade agreement, having for its object the collection of debts.

9. There shall be no provisions, in any trade agreement, which will prevent the doing of cutting by the trade which installs the work for which the cutting is done.

10. Unskilled work, as defined in the trade agreements, may be performed by the laborers or helpers. The work that has been heretofore recognized to be in the possession of a trade shall not be submitted to arbitration, unless possession is claimed by a party or parties to a jurisdiction of trade dispute.

11. All contractors party to this agreement, agree to be bound by decisions of the United Association, the B.T.E.A. of New York City or the National Joint Board.

12. The Employers recognize that the Union had a legitimate goal of preserving bargaining unit work opportunities for the Steamfitters who are or have been regularly employed under the Trade Agreement.

The Employers also recognize that the above goal can sometimes best be achieved through the flexibility of modifying work rules (other than those pertaining to wages, benefit fund contribution rates, or apprentice ratios) for a particular project.

Therefore, if modifications are approved by the Joint Trade Board to preserve bargaining unit work, the Employers agree that they will not invoke the Most Favored Nations Clause, Article X, second paragraph, based

on the Trade Board's modification of Work Rules (other than those pertaining to wages, benefit fund contribution rates, or apprentice ratios) for a particular job project.

NEW SUPPLEMENT FOR LONG ISLAND AND RESIDENTIAL WORK IN NEW YORK CITY

For jobs bid on or after July 1, 2021, the terms of the Public Works Supplement will be used:

1. for all jobs on Long Island, NY except power generation jobs,

2. for residential jobs in Brooklyn, Queens, the Bronx, and Staten Island, NY,

3. for residential jobs in Manhattan.

For purposes of this provision "residential job" means all new construction or renovation of residential buildings, and a residential job is defined as single-family units contained in a multi-story building or a budget/economy hotel such as Hilton Garden Inn, Hampton Inn, Holiday Inn Express, Marriott Courtyard (or any others as agreed to by the Joint Trade Board); residential building does not include nursing homes, assisted living facilities, hospitals, college dormitories, or hotels (other than budget/economy hotels).

A residential building may include up to two floors of offices, stores, and/or restaurants; this Supplement shall not apply to those floors, unless included in the base building contract.

The most favored nation's provision of the Trade Agreement, Article X, second paragraph, will not apply to or be invoked as to this Supplement.

This Supplement shall not apply to, or be invoked as to any job bid prior to July 1, 2021, and this Supplement shall not apply to any job governed by a Project Labor Agreement bid prior to July 1, 2021.

All work bid under the terms and conditions of this Agreement, shall be completed under the terms of this Agreement.

Temporary services will be maintained at the owner's request in accordance with the Trade Agreement. Once the system is on automatic, then no temporary services will be required.

The Supplement shall expire June 30, 2022 as to item (3) residential jobs in Manhattan.

PUBLIC WORKS SUPPLEMENT

SCOPE

This Public Works Supplement is limited to public works projects (Federal, State, City) to be performed under prevailing rate laws (Davis-Bacon Act and/or Labor Law Section 220), and is applicable to HVAC and mechanical public works contracts with a dollar value not to exceed Thirty Million dollars ($30,000,000) and to fire protection/sprinkler public works contracts with a dollar value not to exceed Three Million dollars ($3,000,000).

TERM

The Supplement is for a period commencing July 1, 2021 to June 30, 2022; the Supplement is to be evaluated by the Joint Trade Board and can be extended for one (1) year periods only if agreed to by the Joint Trade Board (there shall be no arbitration to resolve any lack of agreement). If a job is bid under the Supplement then the terms of the Supplement remain in effect for that job until its completion.

RULE I

Section I: Hours of labor shall be 7 or 8 hours per day, at the contractor's discretion, to be performed between 6:00 six o'clock A.M. to 4:30 four thirty P.M.

Section VI: Parties agree to a shift plan for all work performed and the steamfitters and/or apprentices shall be paid the wage rate for regular time plus a fifteen percent (15%) premium on both wages and fringe benefit

contributions.

RULE III
RATE FOR OVERTIME AND HOLIDAYS

Section I. On transit projects, where work is performed in the vicinity of tracks all shift work on weekends and holidays may be performed at regular shift rates.

RULE V

Section I: All work to be performed under this agreement within the jurisdiction of the Enterprise Association must be performed by Journeymen Steamfitters, Apprentices or Trainees.

The crew size shall be any number of men required to safely perform the work, and shall be increased or decreased at the discretion of the employer.

Hiring of Steamfitters shall be in even numbers. An even number of Steamfitters shall be employed on the job at all times. At no time will the amount of Apprentices and/or Trainees exceed the number of Journeymen on the job. (The work of all Apprentices and Trainees will be supervised by a Steamfitter Journeyman).

Section II: It is the employer's discretion to designate a foreman who must be a Journeyman Steamfitter. A foreman so designated shall be allowed to work with tools.

RULE IX
CUTTING UP AND MAKING FITTINGS

Section I: All pipe may be cut, threaded, grooved and have fittings made up by hand or machine on the job or in the shop of the direct employer at the option of direct employer. If the said shop is a permanent shop, equipped with permanently installed pipe cutting and threading machinery, then the work shall be done by a Steamfitter working alone. When a direct employer has no permanently installed pipe cutting machinery in his shop, such work shall be done in accordance with Rule V on the job, or in any shop employing 638 Steamfitters.

Section II: All sprinkler and combination sprinkler/standpipe systems inclusive of cross mains, stringers and fire hose stations connecting pipe to same may be cut, threaded or grooved in a shop or on the job at the option of direct employer.

All fittings above 2" on sprinkler work may be made up in the shop of the direct employer by a Steamfitter working alone or on the job at the option of the employer. The makeup of fittings up to and including 2" in diameter can be ordered from any shop. Prefabricated flexible sprinkler heads not to exceed twenty-four (24) inches are permissible.

All types of chemical fire protection systems is the work to be performed by Journeymen Steamfitters and/or Apprentices.

Section III: All Pipe Fabrication performed in a shop under Section I and II must be labeled before leaving the shop. The Journeyman performing the work must attach labels to the pipe showing the Journeyman's name, signature, book number, name and address of the shop and date when work was performed to demonstrate that such work was done by a Journeyman Steamfitter within this bargaining unit and under the terms of this Agreement. Reproductions of the Journeyman's signature will not be acceptable.

Public works labels shall be obtained by written application to Local Union 638 from individual employers. These labels shall be delivered by the Union to the Steamfitter in charge of each shop, and he shall be fully responsible for the proper distribution of these labels.

Section IV: Radiator branches, convector branches and coil connections shall be cut, threaded, welded, brazed, glued, soldered or any other method of joining shall be done on the job by hand or machine in accordance with Rule V or at the option of the contractor in a shop employing 638 steamfitters.

Section VI: Pipe of all diameters can be ordered from a supply house cut into pieces for ease of access or handling and delivered to the shop of the direct employer or the job site. Half lengths of pipe ordered from a supply house may have a mill bevel, thread or groove on each end. Pipe up to and including 12" diameter may be ordered cut to length with both ends prepared from any supply house. This rule does not apply to combination standpipe.

Section VII: All pipe used for temporary services which has been cut in the shop or on the job and subsequently removed may be used again.

RULE X
WELDING

Section V: Pipe up to and including 12" in diameter may be ordered cut to length with both ends prepared from any supply house. This rule does not apply to combination standpipe.

RULE XI

Section VII: When Steamfitters are working in the building no temporary service personnel are required.

Section VIII: Temporary air conditioning services will only be required for central chiller plant operation.

Section XIII: When temporary services are required the number of Steamfitters required shall be determined by the employer and the Union for the safe operation of the system.

RULE XV
SHIFT WORK

Section I: Shift work may be performed at the option of the employer outside of the regular work day except Saturday, Sunday, and Holidays, in accordance with the following:

a) A shift shall consist of eight (8) working hours. All work performed in excess of eight (8) hours shall be paid at double the rate for regular time. No shift shall commence after 7:00 p.m. on Friday or 7:00 p.m. the day before holidays. All work performed after 12:01 Saturday or 12:01 the day before a Holiday will be paid at double the rate for regular time.

b) Starting time for each shift shall be designated by the employer.

c) A Steamfitter or Apprentice who has worked during the same regular workday shall not be assigned to shift work.

d) The employer shall notify the Union 24 hours prior to the start of shift work.

e) A Steamfitter or Apprentice shall not work more than one shift in a 24-hour period.

f) When shift work is performed, Steamfitters and/or Apprentices shall be paid the wage rate for regular time worked plus a 15% premium and regular fringe benefit contribution rate plus a 15% premium.

g) When the N.Y.S. Department of Transportation, a local School District, or any other Governmental Agency requires night shift work, employees shall be paid the wage rate for regular time worked plus a fifteen percent (15%) premium, together with the regular fringe benefit contribution plus a fifteen percent (15%) premium.

TERM OF THIS AGREEMENT

It is further mutually agreed that no change in this agreement shall be asked for by either party hereto, to take effect prior to the first day of July 1, 2023.

ARTICLE FIVE

It is understood and agreed that this agreement is based upon the Principles for Trade Agreements as set forth in the printed annex to this agreement, and nothing in the Rules of the Enterprise Association attached hereto, or within this agreement, shall be interpreted to contradict or nullify any of the said Principles.

It is agreed that the Favored Nation Clause as stated in the existing trade agreement is not applicable to the Public Works Supplement.

It is understood and agreed that in case any provision of this agreement shall be found to be contrary to law, such finding shall not in any way affect the other provisions of this agreement, which shall, notwithstanding,

continue in full force and effect and the parties shall within ten (10) days after receipt of written notice by one party to the other, negotiate in an attempt to arrive at an appropriate substitute provision in light of such ruling.

In the event of change of applicable Federal Laws affecting this agreement, by virtue of which change it shall become legal for the Enterprise Association to demand that only members of Enterprise Association be employed in the performance of work under its jurisdiction, or to institute what is commonly known as the "closed shop," the Employer agrees that in such event and on the giving of ten (10) days' notice to the Employer by Enterprise Association in writing by registered mail, this agreement shall be deemed amended to the end that on and after the conclusion of the said ten (10) days period only members of the Enterprise Association shall be employed by the Employer in the performance of work coming within the jurisdiction of Enterprise Association and only members of the Metal Trades Branch of Local Union 638 shall be employed in the performance of service work more particularly described in Rule XVI of this agreement.

INDEX FOR STEAMFITTING TRADE AGREEMENT

ATTACHMENTS
PART II: DOCUMENTS REQUIRED

HEALTH/DISABILITY BENEFIT COVERAGE

Interoffice Memo

To: All Staff
From:
Re: Aetna Health Plan Medical - Effective February 1st, 2023

Dear Valued Employee:

We have completed an extensive review of our Group Health Plan and are happy to advise that we will be remaining with Aetna's Health plan effective our February 1st, 2023 renewal. In addition, we are continuing the Health Reimbursement Arrangement (HRA) at the same level of 50% of the Deductible amount.

Please note there are no changes and will remain:

Our renewal plan with Aetna will have an Individual Deductible of $5,000 and a Family Deductible of $10,000 with the maximum out of pocket of $5,400 for an individual and $10,800 for a family.

Please find attached detailed summary of benefits.

If you have previously waived coverage and are interested in enrolling, now is the time.

The per pay (Weekly) contributions for the Aetna Medical Plan:
_____$ 1.00 Employee Only
_____$ 1.00 Employee + Spouse
_____$ 1.00 Employee + Child(ren)
_____$ 1.00 Family

_____I elect to waive medical coverage and understand that unless there is a qualifying event I will not be able to elect a plan until the next open enrollment period.

Reason for Refusal (please check all appropriate boxes)
❑ I have other coverage from:
- ❑ My spouse's employer ❑ Medicare ❑ Medicaid
- ❑ Veteran's Administration ❑ Union health plan
- ❑ Another source of coverage (please specify):

REQUIRED INFORMATION: _____
Name of Carrier Policy Number

Election: I authorize C.D.E. Air Conditioning Co., Inc. to make a pre-tax deduction from my paycheck each pay period which equals, and is used for, my share of the premium coverage I have selected for medical insurance. Authorization and Agreement: I understand this authorization revokes any previous salary reduction agreement for medical insurance. I further understand that this authorization will remain in effect for all future Plan Years unless revoked or modified. I understand these payroll deductions cannot be adjusted during the Plan Year, unless I experience a change in family status or other qualifying event as described in section 125 of the IRC and in the Summary Plan Description for the Tax Saver Plan. I further understand that this election will continue to apply to all future premium increases that are to be paid by employees.

_____ _____ _____
Employee Name Employee Signature Date

aetna : NY Silver OAEPO 5000 50% HSA PY

Coverage for: Employee + Family | Plan Type: EPO

The Summary of Benefits and Coverage (SBC) document will help you choose a health plan. The SBC shows you how you and the plan would share the cost for covered health care services. NOTE: Information about the cost of this plan (called the premium) will be provided separately. This is only a summary. For more information about your coverage, or to get a copy of the complete terms of coverage, https://www.aetna.com/sbcsearch/getpolicydocs?u=080200-100020-162213 or by calling 1-888-802-3862. For general definitions of common terms, such as allowed amount, balance billing, coinsurance, copayment, deductible, provider, or other underlined terms, see the Glossary. You can view the Glossary at https://www.healthcare.gov/sbc-glossary/ or call 1-888-802-3862 to request a copy.

Important Questions	Answers	Why This Matters:
What is the overall deductible?	For each Plan Year, In-Network: Individual $5,000 / Family $10,000.	Generally, you must pay all of the costs from providers up to the deductible amount before this plan begins to pay. If you have other family members on the plan, each family member must meet their own individual deductible until the total amount of deductible expenses paid by all family members meets the overall family deductible.
Are there services covered before you meet your deductible?	Yes. Preventive care in-network.	This plan covers some items and services even if you haven't yet met the deductible amount. But a copayment or coinsurance may apply. For example, this plan covers certain preventive services without cost sharing and before you meet your deductible. See a list of covered preventive services at https://www.healthcare.gov/coverage/preventive-care-benefits/.
Are there other deductibles for specific services?	No.	You don't have to meet deductibles for specific services.
What is the out-of-pocket limit for this plan?	In-Network: Individual $5,400 / Family $10,800.	The out-of-pocket limit is the most you could pay in a year for covered services. If you have other family members in this plan, they have to meet their own out-of-pocket limits until the overall family out-of-pocket limit has been met.
What is not included in the out-of-pocket limit?	Premiums and health care this plan doesn't cover.	Even though you pay these expenses, they don't count toward the out-of-pocket limit.
Will you pay less if you use a network provider?	Yes. See http://www.aetna.com/docfind or call 1-888-802-3862 for a list of in-network providers.	This plan uses a provider network. You will pay less if you use a provider in the plan's network. You will pay the most if you use an out-of-network provider, and you might receive a bill from a provider for the difference between the provider's charge and what your plan pays (balance billing). Be aware, your network provider might use an out-of-network provider for some services (such as lab work). Check with your provider before you get services.
Do you need a referral to see a specialist?	No.	You can see the specialist you choose without a referral.

All **copayment** and **coinsurance** costs shown in this chart are after your **deductible** has been met, if a **deductible** applies.

Common Medical Event	Services You May Need	What You Will Pay		Limitations, Exceptions, & Other Important Information
		In-Network Provider (You will pay the least)	Out–of–Network Provider (You will pay the most)	
If you visit a health care provider's office or clinic	Primary care visit to treat an injury or illness	50% coinsurance	Not covered	None
	Specialist visit	50% coinsurance	Not covered	None
	Preventive care /screening /immunization	No charge	Not covered	You may have to pay for services that aren't preventive. Ask your provider if the services needed are preventive. Then check what your plan will pay for.
If you have a test	Diagnostic test (x-ray, blood work)	50% coinsurance	Not covered	Applies to services received in office or in outpatient setting.
	Imaging (CT/PET scans, MRIs)	50% coinsurance	Not covered	Applies to services received in office or in outpatient setting.
If you need drugs to treat your illness or condition More information about **prescription drug coverage** is available at http://aet.na/nysg23	Preferred/non-preferred generic drugs	$15 copay/ prescription (retail), $37.50 copay/ prescription (mail order)	Not covered	Covers up to a 30 day supply (retail prescription), 31-90 day supply (mail order prescription). Your cost will be higher for choosing Brand over Generics; cost difference penalty doesn't apply to overall deductible or out-of-pocket limit. No charge for preferred generic FDA-approved women's contraceptives in-network.
	Preferred brand drugs	$65 copay/ prescription (retail), $162.50 copay/ prescription (mail order)	Not covered	
	Non-preferred brand drugs	50% coinsurance (retail & mail order)	Not covered	
	Preferred/non-preferred specialty drugs	Applicable cost as noted above for generic or brand drugs	Not covered	All specialty prescription drug fills on initial fill must be filled at a network specialty pharmacy except for urgent situations. Your plan may include access to CVS retail pharmacies for certain specialty drugs.
If you have outpatient surgery	Facility fee (e.g., ambulatory surgery center)	50% coinsurance	Not covered	None
	Physician/surgeon fees	50% coinsurance	Not covered	None
If you need immediate medical attention	Emergency room care	50% coinsurance	50% coinsurance	Out-of-network emergency room care cost-share same as in-network. No coverage for non-emergency care.
	Emergency medical transportation	50% coinsurance	50% coinsurance	Out-of-network cost-share same as in-network.

Common Medical Event	Services You May Need	What You Will Pay		Limitations, Exceptions, & Other Important Information
		In-Network Provider (You will pay the least)	Out–of–Network Provider (You will pay the most)	
	Urgent care	50% coinsurance	Not covered	No coverage for non-urgent use.
If you have a hospital stay	Facility fee (e.g., hospital room)	50% coinsurance	Not covered	None
	Physician/surgeon fees	50% coinsurance	Not covered	None
If you need mental health, behavioral health, or substance abuse services	Outpatient services	Office visits and all other outpatient services: 50% coinsurance	Not covered	None
	Inpatient services	50% coinsurance	Not covered	None
If you are pregnant	Office visits	No charge	Not covered	Cost sharing does not apply for preventive services. Maternity care may include tests and services described elsewhere in the SBC (i.e. ultrasound).
	Childbirth/delivery professional services	50% coinsurance	Not covered	
	Childbirth/delivery facility services	50% coinsurance	Not covered	
If you need help recovering or have other special health needs	Home health care	25% coinsurance	Not covered	Coverage is limited to 40 visits.
	Rehabilitation services	50% coinsurance	Not covered	Coverage is limited to 60 visits for Physical Therapy, Occupational Therapy & Speech Therapy combined.
	Habilitation services	50% coinsurance	Not covered	None
	Skilled nursing care	50% coinsurance	Not covered	None
	Durable medical equipment	50% coinsurance	Not covered	Coverage is limited to 1 durable medical equipment for same/similar purpose. Excludes repairs for misuse/abuse.
	Hospice services	50% coinsurance	Not covered	None
If your child needs dental or eye care	Children's eye exam	50% coinsurance	Not covered	Coverage is limited to 1 exam every 12 months up to age 19.
	Children's glasses	50% coinsurance	Not covered	Coverage is limited to 1 set of frames and 1 set of contact lenses or eyeglass lenses every 12 months up to age 19 unless required more frequently with appropriate documentation.
	Children's dental check-up	0% coinsurance	Not covered	Coverage is limited to 1 dental exam and cleaning per 6-month period up to age 19.

Excluded Services & Other Covered Services:

Services Your Plan Generally Does NOT Cover (Check your policy or plan document for more information and a list of any other excluded services.)

- Cosmetic surgery
- Dental care (Adult)
- Long-term care
- Non-emergency care when traveling outside the U.S.
- Private-duty nursing
- Routine eye care (Adult)
- Routine foot care
- Weight loss programs

Other Covered Services (Limitations may apply to these services. This isn't a complete list. Please see your plan document.)

- Acupuncture - Coverage is limited to 10 visits.
- Bariatric surgery
- Chiropractic care
- Hearing aids - Coverage is limited to one every 3 years (one or both ears). Includes repair and replacement.
- Infertility treatment - Benefit limitations may apply.

Your Rights to Continue Coverage: There are agencies that can help if you want to continue your coverage after it ends. The contact information for those agencies is: Department of Financial Services, Consumer Assistance Unit, 800-342-3736, https://www.dfs.ny.gov/consumers/health_insurance/new_york_health_insurance_policies__programs.

- If your group health coverage is subject to ERISA, you may also contact the Department of Labor's Employee Benefits Security Administration at 1-866-444-EBSA (3272) or www.dol.gov/ebsa/healthreform.
- For more information on your rights to continue coverage, contact the plan at 1-888-802-3862.
- For non-federal governmental group health plans, you may also contact the Department of Health and Human Services, Center for Consumer Information and Insurance Oversight, at 1-877-267-2323 x61565 or www.cciio.cms.gov.
- If your coverage is a church plan, church plans are not covered by the Federal COBRA continuation coverage rules. If the coverage is insured, individuals should contact their State insurance regulator regarding their possible rights to continuation coverage under State law.

Other coverage options may be available to you too, including buying individual insurance coverage through the Health Insurance Marketplace. For more information about the Marketplace, visit www.HealthCare.gov or call 1-800-318-2596.

Your Grievance and Appeals Rights: There are agencies that can help if you have a complaint against your plan for a denial of a claim. This complaint is called a grievance or appeal. For more information about your rights, look at the explanation of benefits you will receive for that medical claim. Your plan documents also provide complete information on how to submit a claim, appeal, or a grievance for any reason to your plan. For more information about your rights, this notice, or assistance, contact:

- If your group health coverage is subject to ERISA, you may contact Aetna directly by calling the toll-free number on your Medical ID Card, or by calling our general toll free number at 1-888-802-3862. You may also contact the Department of Labor's Employee Benefits Security Administration at 1-866-444-EBSA (3272) or www.dol.gov/ebsa/healthreform.
- Department of Financial Services, Consumer Assistance Unit, 800-342-3736, https://www.dfs.ny.gov/consumers/health_insurance/new_york_health_insurance_policies__programs.
- For non-federal governmental group health plans, you may also contact the Department of Health and Human Services, Center for Consumer Information and Insurance Oversight, at 1-877-267-2323 x61565 or www.cciio.cms.gov.
- Additionally, a consumer assistance program can help you file your appeal. Contact Community Health Advocates, Community Service Society of New York, 633 Third Avenue 10th Floor, New York, NY 10017, 1-888-614-5400, http://www.communityhealthadvocates.org/

Does this plan provide Minimum Essential Coverage? Yes.

Minimum Essential Coverage generally includes plans, health insurance available through the Marketplace or other individual market policies, Medicare, Medicaid, CHIP, TRICARE, and certain other coverage. If you are eligible for certain types of Minimum Essential Coverage, you may not be eligible for the premium tax credit.

Does this plan meet Minimum Value Standards? Yes.

If your plan doesn't meet the Minimum Value Standards, you may be eligible for a premium tax credit to help you pay for a plan through the Marketplace.

To see examples of how this plan might cover costs for a sample medical situation, see the next section.

About these Coverage Examples:

This is not a cost estimator. Treatments shown are just examples of how this plan might cover medical care. Your actual costs will be different depending on the actual care you receive, the prices your providers charge, and many other factors. Focus on the cost-sharing amounts (deductibles, copayments and coinsurance) and excluded services under the plan. Use this information to compare the portion of costs you might pay under different health plans. Please note these coverage examples are based on self-only coverage.

Peg is Having a Baby
(9 months of in-network pre-natal care and a hospital delivery)

- **The plan's overall deductible** **$5,000**
- **Specialist coinsurance** **50%**
- **Hospital (facility) coinsurance** **50%**
- **Other coinsurance** **50%**

This EXAMPLE event includes services like:

Specialist office visits *(prenatal care)*
Childbirth/Delivery Professional Services
Childbirth/Delivery Facility Services
Diagnostic tests *(ultrasounds and blood work)*
Specialist visit *(anesthesia)*

Total Example Cost	**$12,700**
In this example, Peg would pay:	
Cost Sharing	
Deductibles	$5,000
Copayments	$0
Coinsurance	$400
What isn't covered	
Limits or exclusions	$60
The total Peg would pay is	**$5,460**

Managing Joe's Type 2 Diabetes
(a year of routine in-network care of a well-controlled condition)

- **The plan's overall deductible** **$5,000**
- **Specialist coinsurance** **50%**
- **Hospital (facility) coinsurance** **50%**
- **Other coinsurance** **50%**

This EXAMPLE event includes services like:

Primary care physician office visits *(including disease education)*
Diagnostic tests *(blood work)*
Prescription drugs
Durable medical equipment *(glucose meter)*

Total Example Cost	**$5,600**
In this example, Joe would pay:	
Cost Sharing	
Deductibles	$5,000
Copayments	$200
Coinsurance	$0
What isn't covered	
Limits or exclusions	$20
The total Joe would pay is	**$5,220**

Mia's Simple Fracture
(in-network emergency room visit and follow up care)

- **The plan's overall deductible** **$5,000**
- **Specialist coinsurance** **50%**
- **Hospital (facility) coinsurance** **50%**
- **Other coinsurance** **50%**

This EXAMPLE event includes services like:

Emergency room care *(including medical supplies)*
Diagnostic test *(x-ray)*
Durable medical equipment *(crutches)*
Rehabilitation services *(physical therapy)*

Total Example Cost	**$2,800**
In this example, Mia would pay:	
Cost Sharing	
Deductibles	$2,800
Copayments	$0
Coinsurance	$0
What isn't covered	
Limits or exclusions	$0
The total Mia would pay is	**$2,800**

Note: These numbers assume the patient does not participate in the plan's wellness program. If you participate in the plan's wellness program, you may be able to reduce your costs. For more information about the wellness program, please contact: 1-888-802-3862.

The plan would be responsible for the other costs of these EXAMPLE covered services.

Assistive Technology

Persons using assistive technology may not be able to fully access the following information. For assistance, please call 1-888-802-3862.

Smartphone or Tablet

To view documents from your smartphone or tablet, the free WinZip app is required. It may be available from your App Store.

Non-Discrimination

Aetna complies with applicable Federal civil rights laws and does not unlawfully discriminate, exclude or treat people differently based on their race, color, national origin, sex, age, disability, gender identity or sexual orientation.

We provide free aids/services to people with disabilities and to people who need language assistance.

If you need a qualified interpreter, written information in other formats, translation or other services, call the number on your ID card.

If you believe we have failed to provide these services or otherwise discriminated based on a protected class noted above, you can also file a grievance with the Civil Rights Coordinator by contacting:

Civil Rights Coordinator,
P.O. Box 14462, Lexington, KY 40512 (CA HMO customers: P.O. Box 24030, Fresno, CA 93779),
1-800-648-7817, TTY: 711,
Fax: 859-425-3379 (CA HMO customers: 860-262-7705), CRCoordinator@aetna.com.

You can also file a civil rights complaint with the U.S. Department of Health and Human Services, Office for Civil Rights Complaint Portal, available at https://ocrportal.hhs.gov/ocr/portal/lobby.jsf, or at: U.S. Department of Health and Human Services, 200 Independence Avenue SW., Room 509F, HHH Building, Washington, DC 20201, or at 1-800-368-1019, 800-537-7697 (TDD).

TTY: 711

Language Assistance:

For language assistance in your language call 1-888-802-3862 at no cost.

Albanian -	Për asistencë në gjuhën shqipe telefononi falas në 1-888-802-3862.
Amharic -	ለቋንቋ እገዛ በ አማርኛ በ 1-888-802-3862 በነጻ ይደውሉ
Arabic -	للمساعدة في (اللغة العربية)، الرجاء الاتصال على الرقم المجاني 1-888-802-3862
Armenian -	Լեզվի ցուցաբերած աջակցության (հայերեն) զանգի 1-888-802-3862 առանց գնով:
Bahasa-Indonesia -	Untuk bantuan dalam bahasa Indonesia, silakan hubungi 1-888-802-3862 tanpa dikenakan biaya.
Bantu-Kirundi -	Niba urondera uwugufasha mu Kirundi, twakure kuri iyi nomero 1-888-802-3862 ku busa
Bengali-Bangala -	বাংলায় ভাষা সহায়তার জন্য বিনামূল্যে 1-888-802-3862-তে কল করুন।
Bisayan-Visayan -	Alang sa pag-abag sa pinulongan sa (Binisayang Sinugboanon) tawag sa 1-888-802-3862 nga walay bayad.
Burmese -	ငွေကုန်ကျခံစရာမလိုဘဲ (မြန်မာဘာသာစကား)ဖြင့် ဘာသာစကားအကူအညီရယူရန် 1-888-802-3862 ကို ခေါ်ဆိုပါ။
Catalan -	Per rebre assistència en (català), truqui al número gratuït 1-888-802-3862.
Chamorro -	Para ayuda gi fino' (Chamoru), ågang 1-888-802-3862 sin gåstu.
Cherokee -	ᎾᏍᎩᎾ ᏕᏛᏂᏯᏍᏗ ᏗᏂᏍᏕᎵᏍᎩ ᎾᏋᎢ (ᏣᎳᎩ) ᏫᏏᎳᏛᎥᏕ 1-888-802-3862 ᎣᎾᎢ Ꮭ ᎪᎱᏍᏗ ᏧᎬᏩᎵᏗ ᏂᎨᏒᎾ.
Chinese -	欲取得繁體中文語言協助，請撥打 1-888-802-3862，無需付費。
Choctaw -	(Chahta) anumpa ya apela a chi I paya hinla 1-888-802-3862.
Cushite -	Gargaarsa afaan Oromiffa hiikuu argachuuf lakkokkofsa bilbilaa 1-888-802-3862 irratti bilisaan bilbilaa.
Dutch -	Bel voor tolk- en vertaaldiensten in het Nederlands gratis naar 1-888-802-3862.
French -	Pour une assistance linguistique en français appeler le 1-888-802-3862 sans frais.
French Creole -	Pou jwenn asistans nan lang Kreyòl Ayisyen, rele nimewo 1-888-802-3862 gratis.
German -	Benötigen Sie Hilfe oder Informationen in deutscher Sprache? Rufen Sie uns kostenlos unter der Nummer 1-888-802-3862 an.
Greek -	Για γλωσσική βοήθεια στα Ελληνικά καλέστε το 1-888-802-3862 χωρίς χρέωση.
Gujarati -	ગુજરાતીમાં ભાષામાં સહાય માટે કોઈ પણ ખર્ચ વગર 1-888-802-3862 પર કૉલ કરો.

Hawaiian -	No ke kōkua ma ka ‘ōlelo Hawai‘i, e kahea aku i ka helu kelepona 1-888-802-3862. Kāki ‘ole ‘ia kēia kōkua nei.
Hindi -	हन्दिी में भाषा सहायता के लिए, 1-888-802-3862 पर मुफ्त कॉल करें।
Hmong -	Yog xav tau kev pab txhais lus Hmoob hu dawb tau rau 1-888-802-3862.
Ibo -	Maka enyemaka asụsụ na Igbo kpọọ 1-888-802-3862 na akwụghị ụgwọ ọ bụla
Ilocano -	Para iti tulong ti pagsasao iti pagsasao tawagan ti 1-888-802-3862 nga awan ti bayadanyo.
Italian -	Per ricevere assistenza linguistica in italiano, può chiamare gratuitamente 1-888-802-3862.
Japanese -	日本語で援助をご希望の方は、1-888-802-3862 まで無料でお電話ください。
Karen -	လၢတၫ်မၤစၢၤတၫ်ကတိၤကျိာ်ၵၢ်အဂီၤ် ကျိာ် ကိး 1-888-802-3862 လၢတအိာ်ဒီးတၫ်လၢာ်ဘူာ်လၢာ်စ့ၤဘာ့
Korean -	한국어로 언어 지원을 받고 싶으시면 무료 통화번호인 1-888-802-3862 번으로 전화해 주십시오.
Kru-Bassa -	Ɓɛ´m`ké gbo-kpá-kpá dyé piɗyi ɖé Ɓaǎɔɔ̀-wuɖuǔn wɛ̃ɛ, ɖá 1-888-802-3862
Kurdish -	برای راهنمایی به زبان فارسی با شماره 1-888-802-3862 به خۆرایی پەیوەندی بکەن.
Laotian -	ຖ້າທ່ານຕ້ອງການຄວາມຊ່ວຍເຫຼືອໃນການແປພາສາລາວ, ກະລຸນາໂທຫາ **1-888-802-3862** ໂດຍບໍ່ເສຍຄ່າໂທ.
Marathi -	कोणत्याही शुल्काशविाय भाषा सेवा प्राप्त करण्यासाठी, 1-888-802-3862 वर फोन करा.
Marshallese -	Ñan bōk jipañ ilo Kajin Majol, kallok 1-888-802-3862 ilo ejjelok wōnān.
Micronesian - Pohnpeyan	Ohng palien sawas en soun kawewe ni omw lokaia Ponape koahl 1-888-802-3862 ni sohte isais.
Mon-Khmer, Cambodian -	សម្រាប់ជំនួយភាសាជា ភាសាខ្មែរ សូមទូរស័ព្ទទៅកាន់លេខ 1-888-802-3862 ដោយឥតគិតថ្លៃ។
Navajo -	T'áá shi shizaad k'ehjí bee shíká a'doowol nínízingo Diné k'ehjí koji' t'áá jíík'e hólne' 1-888-802-3862
Nepali -	(नेपाली) मा नःिशुल्क भाषा सहायता पाउनका लागि 1-888-802-3862 मा फोन गर्नुहोस् ।
Nilotic-Dinka -	Tën kuɔɔny ë thok ë Thuɔŋjäŋ cɔl 1-888-802-3862 kecïn aɣöc.
Norwegian -	For språkassistanse på norsk, ring 1-888-802-3862 kostnadsfritt.
Punjabi -	ਪੰਜਾਬੀ ਵੱਚਿ ਭਾਸ਼ਾਈ ਸਹਾਇਤਾ ਲਈ, 1-888-802-3862 ‘ਤੇ ਮੁਫ਼ਤ ਕਾਲ ਕਰੋ।
Pennsylvania Dutch -	Fer Helfe in Deitsch, ruf: 1-888-802-3862 aa. Es Aaruf koschtet nix.

Persian -	برای راهنمایی به زبان فارسی با شماره 1-888-802-3862 بدون هیچ هزینه ای تماس بگیرید. انگلیسی
Polish -	Aby uzyskać pomoc w języku polskim, zadzwoń bezpłatnie pod numer 1-888-802-3862.
Portuguese -	Para obter assistência linguística em português ligue para o 1-888-802-3862 gratuitamente.
Romanian -	Pentru asistenţă lingvistică în româneşte telefonaţi la numărul gratuit 1-888-802-3862
Russian -	Чтобы получить помощь русскоязычного переводчика, позвоните по бесплатному номеру 1-888-802-3862.
Samoan -	Mo fesoasoani tau gagana I le Gagana Samoa vala'au le 1-888-802-3862 e aunoa ma se totogi.
Serbo-Croatian -	Za jezičnu pomoć na hrvatskom jeziku pozovite besplatan broj 1-888-802-3862.
Spanish -	Para obtener asistencia lingüística en español, llame sin cargo al 1-888-802-3862.
Sudanic-Fulfude -	Fii yo on heɓu balal e ko yowitii e haala Pular noddee e oo numero ɗoo 1-888-802-3862 Njodi woo fawaaki on.
Swahili -	Ukihitaji usaidizi katika lugha ya Kiswahili piga simu kwa 1-888-802-3862 bila malipo.
Syriac -	ܠܐ ܒܥܝܐ ܐܠܐ ܬ ܡܫܡܥܝܢ ܥܘܕܪܢܐ ܒܠܫܢܐ ܣܘܪܝܝܐ ܗܘܐ ܠܟ ܩܪܝܐ ܬܠܦܘܢ 1-888-802-3862 ܡܓܢܐ.
Tagalog -	Para sa tulong sa wika na nasa Tagalog, tawagan ang 1-888-802-3862 nang walang bayad.
Telugu -	భాషతో సహాయం కోసం ఎలాంటి ఖర్చు లేకుండా **1-888-802-3862** కు కాల్ చేయండి. (తెలుగు)
Thai -	สำหรับความช่วยเหลือทางด้านภาษาเป็น ภาษาไทย โทร 1-888-802-3862 ฟรีไม่มีค่าใช้จ่าย
Tongan -	Kapau ‘oku fiema'u hā tokoni ‘i he lea faka-Tonga telefoni 1-888-802-3862 ‘o ‘ikai hā tōtōngi.
Trukese -	Ren áninnisin chiakú ren (Kapasen Chuuk) kopwe kékkééri 1-888-802-3862 nge esapw kamé ngonuk.
Turkish -	(Dil) çağrısı dil yardım için. Hiçbir ücret ödemeden 1-888-802-3862.
Ukrainian -	Щоб отримати допомогу перекладача української мови, зателефонуйте за безкоштовним номером 1-888-802-3862.
Urdu -	بلاقیمت زبان سے متعلقہ خدمات حاصل کرنے کے لیے ، 1-888-802-3862 . پر بات کریں
Vietnamese -	Để được hỗ trợ ngôn ngữ bằng (ngôn ngữ), hãy gọi miễn phí đến số 1-888-802-3862.
Yiddish -	פאר שפראך הילף אין אידיש רופט 1-888-802-3862 פריי פון אפצאל.
Yoruba -	Fún ìrànlọ́wọ́ nípa èdè (Yorùbá) pe 1-888-802-3862 lái san owó kankan rárá.

EMPLOYEE POLICY/ HANDBOOK

Commercial
Domestic
Electric

C.D.E. Air Conditioning Co., Inc.
Established 1930

321 - 39th Street
Brooklyn, NY 11232

Phone: (718) 788-1040
Fax: (718) 788-2046
www.cdeair.com

EQUAL EMPLOYMENT POLICY

It is the policy of C.D.E. Air Conditioning Co., Inc. not to discriminate against any employee or applicant for employment because of race, color, national origin, sex, age, disability, creed, marital status, citizenship status or sexual orientation. We will take specific action to ensure the treatment of all employees and applicants for employment without unlawful discrimination as to race, creed, color, national origin, sex, age, disability, marital status, sexual orientation or citizenship status in all employment decisions, including but not limited to recruitment, hiring, compensation, training and apprenticeship, promotion, upgrading, demotion, downgrading, transfer, lay-off and termination, and all other terms and conditions of employment except as provided by law.

Mitchell I. Merdinger is the Director of our equal employment opportunity programs. As Director of C.D.E. Air Conditioning Co., Inc.'s equal employment programs the responsibility includes:

i. Developing policy statements, equal employment programs, internal and external communication techniques and programs;
ii. Assisting in the identification of problem areas;
iii. Assisting line management in arriving at solutions to problems;
iv. Designing and implementing audit and reporting systems that will:
    a. Measure effectiveness of the policy and implementing programs including supervisors' and management's adherence to the equal opportunity policy;
    b. Indicate need for remedial action; and
    c. Determine the degree to which the equal employment objectives have been met.
v. Serve as liaison between the company and enforcement agencies;
vi. Serve as liaison between the company and minority organizations, women's organizations, advocate organizations for other protected groups and community action groups concerned with equal employment opportunity.

To ensure adherence to this policy, performance evaluations for supervisory personnel shall include ratings on their equal employment opportunity efforts and results.

Additionally, in furtherance of our equal employment opportunity commitment, C.D.E. Air Conditioning Co., Inc. shall: insist that labor unions and other recruiting sources actively recruit and refer members of all protected groups for all positions; incorporate non-discriminatory provisions in all its contracts and purchase orders.

C.D.E. Air Conditioning Co., Inc.

Brian J. Azara, Secretary

401K COVERAGE/ DESCRIPTION

C.D.E. Profit Sharing Trust
Salary Deferral Agreement

Section 1. Participant Information

Name _____

Address _____

City _____ **State** _____ **Zip Code** _____

Date of Birth _____ **Date of Hire** _____ **Social Security #** _____

Section 2. Election Not to Defer

☐ I do not wish to contribute to the Plan at this time. However, I understand that I can elect to contribute to the Plan in the future, and that any such future election can only be made at such time or times as permitted under the Plan's policy governing salary reduction elections.

Section 3. Election to Defer

☐ I elect to contribute $_____ to the Plan each pay period **(See the note below)**

☐ I elect to contribute _____% of my compensation to the Plan each pay period **(See the note below)**

Note: If you have not attained age 50, your Salary Deferral Contributions for any calendar year can't exceed the lesser of 100% of your Compensation or the dollar limit on Salary Deferral Contributions (which is announced annually by the IRS and is currently $22,500). For any calendar year in which you have attained (or will attain) at least age 50 by the end of that year, your Elective Deferrals for the calendar year can't exceed the lesser of 100% of your Compensation or $30,000 (or such higher limit as announced annually by the IRS).

I understand (1) that I can change my election from time to time as permitted under the Plan's salary reduction policy; (2) that I can suspend or cancel my election upon reasonable written notice to the Administrator; (3) that if I do cancel or suspend my election, I can make a new election at such times as permitted under the Plan's policy governing salary reduction elections; and (4) that it may be necessary for the Plan to reduce the percentage or dollar amount I have indicated above if necessary for the Plan to comply with certain non-discrimination and/or maximum deduction tests required by the Internal Revenue Code.

Section 4. Participant's Signature

Signature _____ **Date** _____

C.D.E. Profit Sharing Trust
Beneficiary Designation Form

Section 1. Participant Information

Name _____

Address _____

City _____ **State** _____ **Zip Code** _____

Date of Birth _____ **Date of Hire** _____ **Social Security #** _____

Section 2. Designation of Primary Beneficiary *(You must complete this section)*

I designate the following as my primary beneficiary or beneficiaries:

Name	Social Security #	Address	Relationship	% Share

Section 3. Designation of Contingent Beneficiary *(Optional)*

If my primary beneficiary predeceases me, I designate the following as my contingent beneficiary or beneficiaries:

Name	Social Security #	Address	Relationship	% Share

Section 4. Trust Information *(Complete this section only if a trust is a named beneficiary)*

If a trust is named as a beneficiary (primary or contingent), the trustees of the trust are _____

_____ and the creation date of the trust is _____.

Section 5. Filing Status *(You must complete this section)*

☐ **(a)** I am legally single.

☐ **(b)** I am legally married and my spouse is the primary beneficiary of 100% of my account.

☐ **(c)** I am legally married and my spouse is <u>not</u> a primary beneficiary of 100% of my account.

Section 6. Participant's Signature

Signature of Participant _____ **Date** _____

Section 7. Spousal Consent *(Complete this section only if Section 5(c) is checked)*

I am the spouse of the employee who completed and signed this form above, and I understand the spousal death benefit to which I am entitled under the terms of the plan. I realize that my spouse is waiving this spousal death benefit and I voluntarily consent to the waiver. I hereby consent to my spouse's designation of beneficiary and agree to release and discharge the Trustee, the Plan Administrator, and the Company from liability for acting pursuant to this irrevocable consent.

Signature of Spouse _____ **Date** _____

Print Name _____

Signature of Witness _____ **Date** _____

Print Name _____

☐ The Witness is a Plan Representative

☐ The Witness is a Notary Public *(complete the following)*

State or Commonwealth of _____

County or Parish of _____

On the_____day of_____, 20___, before me, the undersigned, a Notary Public in and for said State or Commonwealth, personally appeared_____, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her capacity, and that by his/her signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Notary Public _____

My commission expires _____

COLLECTIVE BARGAINING AGREEMENTS

OFFICIAL
WORKING AGREEMENT

BETWEEN

MECHANICAL SERVICE CONTRACTORS ASSOCIATION OF NEW YORK, INC.

AND

ENTERPRISE ASSOCIATION
METAL TRADES BRANCH
LOCAL UNION 638

Refrigeration, Air Conditioning,

Air Cooling, and Oil Burner

Service and Maintenance Technicians

EFFECTIVE July 1, 2021

TERMINATES June 30, 2025

INDEX

CONTENTS

AGREEMENT AND CONTRACT between the Mechanical Service Contractors Association of New York, Inc., and the Metal Trades Branch of Local Union 638 United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, affiliated with the AFL-CIO.

ARTICLE I

This Agreement made this 1st day of July 2021 by and between the Mechanical Service Contractors Association of New York, Inc. whose members shall hereinafter be referred to as employers and the Metal Trades Branch of Local Union 638 United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, affiliated with the AFL-CIO, hereinafter referred to as the Union whose members shall hereinafter be referred to as employees, is made for the purpose of preventing strikes and lockouts and facilitating a peaceful adjustment of all grievances and disputes which may rise between the employers and employees represented by this Agreement.

ARTICLE II

1. It is mutually agreed that this Agreement applies to installation, service, maintenance, repair and replacement, assembling and disassembling of all parts and equipment pertaining to industrial, commercial and domestic refrigeration, air cooling and heating, air conditioning, and oil burner installation and service work and all other equipment which is now and will be in the future maintained by the employers.

2. This Agreement shall be and remain in effect from July 1, 2021 through June 30, 2025, and it is mutually agreed that ninety (90) days prior to June 30, 2025, either party may serve written notice on the other of its desire that the contract be re-opened then for consideration of a change therein and specify such change.

3. In the event of a proposed change, both parties hereby agree to arrange a conference between them to be held within ten (10) days after the serving of such notice for the purpose of negotiating the proposed change or changes.

4. In case no notice is served by either party ninety (90) days prior to the expiration of this Agreement, requesting a change, then this Agreement shall continue in effect until a new one is consummated.

ARTICLE III

1. The union agrees to furnish to the employers competent technicians who will be chosen for the particular skills required by the employers in sufficient numbers as may be necessary to properly execute work contracted for by the employer in manner and under the conditions specified in this agreement. The employer agrees to make all reasonable efforts to notify the Union when in need of new employees.

2. The employers agree to require membership in the Union as a condition of continued employment of all employees performing any of the work specified in Article V of this Agreement within forty-five (45) days following the beginning of such employment or the effective date of this Agreement, whichever is the later, provided the employers have reasonable ground for believing that membership is available to such employees on the same terms and conditions generally applicable to other members and that membership is not denied or terminated for reasons other than the failure of the employee to tender the periodic dues and initiation fees uniformly required as a condition of acquiring or retaining membership. Newly engaged employees shall be recorded as on trial for a period of forty-five (45) days after which they shall be considered regular employees of the employers to be governed thereinafter by this Agreement. The employers are required to contribute to the Pension Fund and the Welfare Fund on behalf of newly engaged employees starting with their first hour of covered employment. The date that a newly engaged employee becomes a member in the Union will serve as the employee's anniversary date for employment with the Employer that the newly engaged employee is with at the time of joining the Union. The employers also agree to retain workers' compensation coverage for all employees, regardless of shop size.

ARTICLE IV

1. The Representatives of the Union shall have admission to the shop or job of the employer at any time during working hours for the purpose of ascertaining whether or not this Agreement is being observed by the parties signatory hereto or for assisting in the adjustment of a grievance.

2. The Union shall have full autonomous jurisdiction over its members through such committees and representatives as may be elected or appointed from time to time. This jurisdiction shall be without interference or restraint in dealing with its members found violating the Charter, Constitution, By-Laws, Working Rules or any part of this agreement.

3. The employees shall elect one of their members as shop steward with the approval of the Union. The duties of the shop steward shall be to see that no part of this agreement shall be broken by employers or employees. The shop steward shall not be discriminated against in any manner.

ARTICLE V

1. Duties of the Refrigeration, Air Conditioning and Oil Burner Maintenance and Installation Technicians.

    a. Interpretation and understanding of Commercial Refrigeration:
    Commercial Refrigeration installation means the installation of refrigeration equipment where the combined compressor horsepower does not exceed five horsepower.

b. Interpretation and understanding of air cooling and heating and air conditioning:

Air cooling and air conditioning installation means the installation of heating and air conditioning equipment on any job where the combined tonnage does not exceed fifteen (15) tons, or equal to 6,000 CFM or 180,000 BTU.

2. Maintenance work shall consist of all repair, service and maintenance work on domestic, commercial and industrial refrigeration, air conditioning and air cooling, and oil burner apparatus and heating apparatus etc., including but not exclusively the charging, evacuation, leak testing and assembling for all machines for domestic, commercial and industrial refrigeration, air conditioning and heating apparatus.

3. Servicing work shall be the adjusting, including capacity adjustments, checking and repairing or replacement of all controls and start up of all machines and repairing all defects that may develop on any system for domestic, commercial and industrial refrigeration and all air conditioning, air cooling, and oil burner apparatus and heating apparatus regardless of size or type.

Work under this Agreement also includes the installation of all oil burners in one and two-family houses or their equivalent.

ARTICLE VI
Hours of Work

1 a. The regular work day for employees covered by this Agreement shall be an eight (8) hour day between the hours of 8:00 a.m. to 5:00 p.m., with one hour for lunch.

b. The employer may provide seven (7) days' notice to change the work day to any eight (8) consecutive hours any time between 7:00 a.m. and 7:00 p.m. (with one hour for lunch) provided the employee(s) agree to such change.

During the work week in which a holiday falls, the employer shall work under only Section 1a or 1b above.

c. The employer may provide seven (7) days' notice to change the regular work day to four (4) consecutive ten (10) hour days (with one hour for lunch) between the hours of 7:00 a.m. and 7:00 p.m. provided the employee(s) agree to such change.

2. The regular work week for all employees covered by this Agreement shall be from Monday to Friday inclusive and shall consist of forty (40) hours.

3. All time worked after eight (8) hours, or ten (10) hours as provided in Article VI, 1c. above, and outside of the regular workday (7:00 a.m. to 7:00 p.m.) Monday to Friday, and all time worked on Saturday, shall be paid at the rate of time and one half. All hours

worked on Sunday shall be paid at double time.

ARTICLE VII
Holidays and Weekends

1. There shall be ten (10) Holidays under this agreement: New Year's Day, Martin Luther King, Jr.'s Birthday, President's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day and Christmas Day.

   If an employee works on any of these holidays he shall be paid double time for all time worked only. If the employee does not work on the above listed holiday(s) said employee shall be paid single time wages for one day. If any of these holidays falls on a Sunday, the holiday will be celebrated on the following Monday.

2. All holidays will be observed in accordance with the date designated by New York State if in conflict with the federally designated date.

3. There shall be one floating holiday per year per employee, which date is to be agreed to between the employer and employee at the beginning of the year.

4. It is further agreed that employees who are instructed to report for work at the office, shop or job on Saturday, Sunday or holidays and are not placed to work, shall receive four hours pay at the regular single time rate for that particular day plus the daily rate for the use of his automobile if he was instructed to furnish it in connection with the particular work he was to perform. If the employee is placed to work he shall receive a minimum of eight (8) hours pay. It is agreed that the employer shall notify employees the day prior if the use of the automobile is not required.

5. The employer agrees that there shall not be any changes in the date of any holiday observed without the consent of the men in the shop.

ARTICLE VIII

1. WAGES

From July 1, 2021 to June 30, 2025

Journeyperson:	$43.35
4th year:	$35.63
3rd year:	$29.51
2nd year:	$25.33
1st year: (2nd 6 mos. of employment)	$20.99
New Employee:	$15.37

(1st 6 mos. of employment)

ADDITIONAL INCREASES

January 1, 2022 to June 30, 2022	$0.50 per hour
July 1, 2022 to December 31, 2022	$0.50 per hour
January 1, 2023 to June 30, 2023	$0.50 per hour
July 1, 2023 to December 31, 2023	$1.25 per hour
January 1, 2024 to June 30, 2024	$1.25 per hour
July 1, 2024 to December 31, 2024	$1.25 per hour
January 1, 2025 to June 30, 2025	$1.25 per hour

The money increase stated is all inclusive and will be allocated in the future.

The Trustees of the Service Fitters Industry Educational Fund shall operate an apprenticeship program approved by and registered with the New York State Department of Labor. Apprentices in such program shall be paid at the wage rate listed above for an employee's classification, e.g., a first year apprentice shall receive the rates of a 1st year (2nd 6 mos. of employment for entire first year), a second year apprentice shall receive the rates of a 2nd year employee, etc.

Contributions to the fringe benefit funds (Article XXII, Welfare Fund, Article XXIII, Pension Fund, Article XXIV, Industry Promotional Fund, Article XXV, Industry Educational Fund, and Article XXVI, United Association International Training Fund) shall be made for apprentices on the same basis as an employee of the corresponding classification, e.g., a first year apprentice shall receive the rates of a 1st year (2nd 6 mos. of employment for entire first year), a second year apprentice shall receive the rates of a 2nd year employee, etc.

Apprentices shall be paid by their Employer for eight (8) hours at their regular rate of pay for attending training classes during the day.

Employees attending the Service Fitters Three Year Training Program shall be paid by their Employer for eight (8) hours at their regular rate of pay for attending training classes during the day.

2. It is agreed that the employer or his representative will notify employees before quitting time, the day prior, if he has no work for them to perform the following day. If the employer fails to give such notice and employees report to the office or shop ready to work and are not placed at work, then such employees shall receive one day's pay at the regular wage rate plus the daily rate for use of his auto if he is required to furnish same in connection with his employment. It is further agreed that employees placed at work on a Saturday, Sunday, or legal holiday shall receive a minimum of eight hours pay at the aforementioned overtime wage rate, plus the daily rate for the use of his auto if instructed

by his employer to furnish it in connection with the work he is performing.

3. First and Second year employees shall be allowed to perform the following work:

    1) Filter changing and maintenance thereof.
    2) Oil and greasing.
    3) Tower and coil cleaning, scraping and painting.
    4) General housekeeping.
    5) Delivery and truck driving of parts and/or equipment trucks.
    6) Taking of water samples.

    Nothing listed above shall prevent the work being done by more experienced technicians.

    No journeyman shall be laid off while any third year man is retained to do the above work. At the end of three (3) years such third year man may be eligible to qualify for a rating as a regular maintenance or installation mechanic.

4. With the exception of the work enumerated in Paragraph 3 no first or second year servicemen employed on service or repair work shall be allowed to do any work in the field unless he is accompanied and supervised by one or more service technicians except in the event of an emergency arising when the employer must use his own discretion as to sending first or second year men out to answer calls.

5. For every three (3) servicemen or maintenance technicians steadily employed, the employer may employ one (1) first or second year man who shall be a member of the Union and if acceptable to the employer, shall be continuously employed for one (1) year. It is understood and agreed that the words in the preceding sentence "acceptable to the employer" are defined to mean, acceptable during the entire one year period.

6. Each individual entity that is signatory to this agreement is mandated with the responsibility to establish criteria for advancement of an employed individual from a fourth year to a journeyperson category. The minimum qualification for consideration to journeyperson category is one year after completion of the fourth year.

    The criteria may include: technical testing as well as on the job performance and responsibility. Evaluation shall be conducted by the employer and/or assigned supervisors.

    The criteria standard should be established by the employer in cooperation with senior mechanics and must be reviewed by a joint committee of Education Fund and/or Training Center representatives.

    It should be understood that there may be more than one such standard within a single company as required by the corporation’s market sectors.

The standard is subject to review from time to time as necessary.

The entire process is intended to set the highest possible standard and quality for union mechanics under this collective bargaining agreement.

Failure to comply with this section in a timely fashion will result in the industry submitting a standard that must be signed off by the signatory of this agreement.

The employee may decline in writing to take such examinations. The Employee has the right to have a witness present at the examination. If an employee takes and fails such examination, he/she has the right to take the examination again within one (1) month after a one (1) year waiting period.

The Union or Mechanical Contractors Association of New York, Inc. may inform the Joint Committee established by Article XXI, 3 that a signatory contractor is not complying with this provision in a timely fashion. If the Committee agrees, it may require such signatory to comply with a standard that it establishes.

ARTICLE IX
On-Call Time

Compensation for on-call time will be agreed to between the employer and employee, but at a minimum of $125.00 per week (seven [7] day period). In no event shall on call time require contributions be made to the Funds in Articles XXII, XXIII, XXIV, XXV and XXVI.

On a call out for On-Call time, a Metal Trades Branch member shall be paid from the time he leaves home until he returns home (portal to portal) after completing the call at the rate of pay for the day that said employee is called out to work. The above does not apply to an employee who already is at work. Because of intense non-union competition, this arrangement will not apply to the supermarket refrigeration or food warehouse industry.

ARTICLE X
Car Allowance

1. Servicemen who furnish their automobiles shall be allowed as expenses for their use during working hours, the sum of Thirty ($30.00) Dollars per day of eight hours or fraction thereof, plus Fifty-five ($.55) Cents per mile for all mileage in excess of 50 miles in any one day, and One ($1.00) Dollar per hour for all calls made on overtime work. No allowance shall be made for overtime use of auto when employee is working overtime on same job that he worked on during the regular working hours.

2. If an employee is on on-call duty either at his home or the shop of his employer after his regular work day, and is required to use his auto to answer a service call, he shall receive as expenses an allowance of One ($1.00) Dollar per hour for use of auto for all time consumed on such call with a minimum allowance of Two ($2.00) Dollars.

3. The employer shall carry contingent liability and property damage insurance covering automobiles furnished by servicemen when used on business authorized by employer.

ARTICLE XI
Joint Arbitration Plan Covering Metal Trades Branch Employers Performing Work on Building Trades Jobs; Subcontracting, etc.

1. Any other work in the control of the Employer signing this Agreement that falls in the jurisdiction of Local 638, but not in the scope as outlined in this Agreement, shall be done in accordance with the Local 638 Construction Branch Agreement or any relevant supplements to a United Association National Residential Agreement, if the supplement takes precedence.

   Should a contractor that is bound by this agreement contract to perform work covered by the Union's Construction Branch Trade Agreement on a job on which the general contractor and all other subcontractors on the job are signatory to collective bargaining agreements with building trades unions performing their respective jurisdictional work on a construction site, then the following shall apply:

   It is further mutually agreed that both parties to this Agreement shall abide by a Joint Arbitration Plan that may be agreed upon by representatives of the several employers' associations and a majority of the unions of the building trades of New York City.

   It is mutually agreed between the parties hereto that in event of disputes between trades, and disputes relative to question of jurisdiction of trade, the parties will abide by previous decisions as to jurisdiction published in the latest issue of the B.T.E.A. Handbook, commonly known as "The Green Book."

   It is mutually agreed between the parties hereto that disputes between trades, and disputes relative to jurisdiction of trade not covered by decision in the latest issue of the B.T.E.A. Handbook, commonly known as "The Green Book", shall be adjusted in accordance with the principles of the New York Plan for the Settlement of Jurisdictional Disputes as set forth in the Joint Arbitration Plan of the New York Building Trades as adopted on July 9, 1903, and amended on April 22, 1905, and as thereafter amended, except to the extent that Section 3 of the said Joint Arbitration Plan requires the employer to employ only members of the union directly or indirectly through subcontractors or otherwise.

   Pending determination of any dispute under the New York Plan for the Settlement of Jurisdictional Disputes as stated in the preceding paragraph the members of the Union shall remain at work on the project without change in status.

2. No refrigeration, air conditioning, air cooling, or oil burner contractor shall avoid or evade his labor provisions in this Agreement by contracting his work to any person or persons subject to labor provisions less stringent than those provided in this agreement.

3. It is agreed that employees will not be permitted to contract, sub-contract or do piece work, nor take any work in competition with the employers.

4. In order to protect wages and working conditions of employees working for the employer under this agreement, the employer shall make every reasonable effort to utilize employees covered by this agreement; however, the employer reserves the right to subcontract any or all work referred to herein, after reasonable documented effort has been made to perform the work with employees covered by this agreement.
5. The union and the employer understand the customer may, at his discretion, choose to perform or directly subcontract for any part or parts of the work herein described. The employer's obligation under this agreement refers only to work that the employer has contracted to perform.

ARTICLE XII

1. The work week shall commence at 12:01 a.m. on Thursday and terminate at midnight the following Wednesday and wages shall be paid in cash or by check on Friday of each week at or before quitting time for work performed during the week ending the Wednesday prior. If the employer should exercise his option by paying wages by check, he shall comply with the provisions of Section 192 of the New York State Labor Law. Employees who are required to go from a job to the shop or office for their pay shall be allowed time for so doing. Employees are to be paid at the option of the employer and signed permission of employee in cash, by electronic or automatic deposit or negotiable payroll check. The employer agrees that if a check or electronic transfer is dishonored because of insufficient funds the employee will receive $50.00 in addition to wages due him from the employer.

ARTICLE XIII

1. Members of the Union employed on an out-of-town job to which it is necessary to travel a long distance shall be paid auto expenses or railroad fare, reasonable room and board, and for traveling time as follows:

Traveling by Railroad, Boat or Plane

(a) Between the hours of 5:00 p.m. of any one day and 8:00 a.m. of the following day, no wages.

(b) Between the hours of 8:00 a.m. and 5:00 p.m., the regular hourly rate of wages.

Traveling by Vehicle

(a) Between the hours of 5:00 p.m. and 8:00 a.m. the following day, no wages shall be paid unless automobile is used, and in which case time and one half shall be paid for all time consumed in traveling plus the car allowance as described in Article X, Section 1. Between the hours of 8:00 a.m. and 5:00 p.m. the regular rate of wages shall be paid.

(b) Employees to start work at 8:00 a.m. on all jobs within a twenty-five (25) mile radius of the employee's home or the employer's shop, whichever is nearer to where he is ordered to work.

ARTICLE XIV
Seniority

1. Seniority shall prevail as to all employees in the 4th Year or Journeyperson classifications. No employees in the 1st, 2nd, or 3rd Year classifications shall claim seniority. There shall be no break in seniority due to injury or illness. In the event of a layoff due to lack of work, men in the different classifications having the greatest length of service shall be retained. In the event of new hiring, preference shall be given to the men having the greatest seniority. This applies only in the different classifications in which he had been previous to the layoff. This does not apply to men employed temporarily during the busy season. It is understood and agreed that no man shall be laid off without a just cause.

2. The employer agrees to notify the Union and the shop steward when hiring new employees or terminating for just cause or layoffs for lack of work.

3. The employer agrees to notify the Union of the suspension of any employee for any reason.

ARTICLE XV
Vacation & Sick Leave

1. All employees covered by the terms of this Agreement who have worked for the same employer for six (6) months in any consecutive twelve month period shall receive a vacation of one (1) week with pay.

2. All employees covered by the terms of this Agreement who have worked for the same employer twelve (12) months in any consecutive twelve month period shall receive a vacation of two (2) weeks with pay.

3. All employees covered by the terms of this Agreement who have worked for the same employer sixty (60) months shall receive a vacation of three (3) weeks with pay. It is agreed however, that the third week of this vacation shall not be taken consecutively with the first two (2) weeks vacation. Any employee entitled to three (3) weeks vacation, under the terms of this Agreement shall be allowed to take the third week of the vacation any time during a 12 month annual period at the mutual Agreement of the employer and employee.

4. Effective January 1, 2014, all employees covered by this Agreement who have worked for the same employer for 252 months (21 years), shall receive a prorated vacation of (3) weeks plus one (1) day for each year worked beginning at 21 years, with pay up to a

maximum of 5 days after 25 years. The schedule is as follows:

21 years of service with the same employer: 3 weeks plus one (1) day
22 years of service with the same employer: 3 weeks plus two (2) days
23 years of service with the same employer: 3 weeks plus three (3) days
24 years of service with the same employer: 3 weeks plus four (4) days
25 years of service with the same employer: 3 weeks plus five (5) days

It is agreed that the third week of vacation and any subsequent additional days shall not be taken consecutively with the first two (2) weeks of vacation as described in Article XV, number 3 above. Any employee entitled to three (3) weeks or more vacation, under the terms of this Agreement shall be allowed to take the third week or more of the vacation any time during the 12 month annual period at the mutual agreement of the employer and employee.

5. In the event that any employee has any unused vacation time, the full amount of unused vacation time shall be payable to the said employee at the end of each calendar year. It is agreed that the employees who have been employed six (6) months or more by the same employer and who leave or are discharged prior to the period when they would have been entitled to their next vacation shall be paid accrued vacation money of one-twelfth (1/12) of the vacation pay he is entitled to for each month worked before his next vacation time. An employee will not be considered absent from work insofar as continuity of employment is concerned in the following instances: proven illness, jury duty, temporary military or naval training service, an agreed leave of absence.

6. The vacation period for employees engaged in refrigeration, air conditioning or air cooling work shall be between September 1st and April 1st or as mutually agreed upon.

7. All employees covered by the terms of this Agreement who have worked for the same employer for one year shall receive three (3) days sick leave. All employees covered by the terms of this agreement who have worked for the same employer for two (2) years shall receive five (5) days sick leave. In the event any employee has any unused sick leave, the full amount of unused sick leave shall be payable to the said employee on the anniversary date of his employment.

ARTICLE XVI
Bereavement & Jury Duty

1. Each employee employed for six months or more shall be granted bereavement pay of three days for a death in the immediate family (spouse, parents, children, parents of spouse) of the employee.

2. Effective July 1, 1993 all employees covered by the terms of this Agreement who have worked for the same employer for sixty (60) consecutive months shall be entitled to be paid, at the regular time rate, for five (5) days of jury duty. Payment for jury duty is not to be repeated for any employee more than once every three (3) years and may be taken

only during the off-season

ARTICLE XVII

1. Employees doing service or maintenance work may be required to furnish their own hand tools. Any of the employees' tools that are broken will be replaced with like and kind by the employer.

ARTICLE XVIII

1. Inasmuch as greater efficiency is desirable, both parties will encourage efficiency and discourage any discrimination in employment of workers on the basis of age and unreasonable limitation on the amount of work a Service Fitter can do.

2. The parties agree not to discriminate on the basis of race, creed, color, national origin, sex, age, disability, marital status, sexual orientation or citizenship with regard to employment, wages, or other terms and conditions of employment.

ARTICLE XIX

1. Employers who require employees to wear a uniform shall furnish and maintain such uniforms free of all cost to employees. Such uniforms are the property of the employer and must be immediately returned to him by employees when they quit their job, are laid off or when new uniforms are issued to replace old ones.

2. All employees covered under this Agreement shall be required to comply with the Clean Air Act of 1990, OSHA and EPA governing the work covered under this Agreement.

3. All special licenses, certificates, permits pertaining to the air conditioning and refrigeration trade will be paid for by the employer.

4. Motor vehicle license to be the responsibility of the employee.

ARTICLE XX

1. The employer agrees to deduct from the salaries of every employee in the second week of each month monthly union dues for all employees covered by the terms of this Agreement upon delivery of authorization to the employer to deduct the same.

2. The employer also agrees to deduct from the salaries of all new employees who will be covered by the terms of this Agreement their initiation fee and dues when necessary and will so notify the Union at the time of hiring of all new employees upon delivery of authorization to the employer to deduct the same.

ARTICLE XXI

1. It is agreed that the signatories to this Agreement will strictly observe all of its terms and it is further agreed that if the Metal Trades Branch of Local Union 638 grants more advantageous terms or conditions to anyone doing similar work as outlined in Article V of this Agreement, then the Agreement shall be immediately amended to include such terms or conditions.

2. It is further mutually agreed that no strike against any employer signatory to this Agreement shall be ordered by any officer of, or entered into by any member of, Metal Trades Branch of Local Union 638 nor shall any lockout against any member of Metal Trades Branch of Local Union 638 be declared by any employer signatory to this Agreement so long as this Agreement is conformed to by the parties herein.

3. (a) It is further agreed that any dispute concerning a violation of the terms, meanings or application of this Agreement shall be referred for adjustment and interpretation to a Committee consisting of four representatives from Local Union 638 and four representatives from Mechanical Service Contractors Association of New York (the "Committee"). The Union may meet with the applicable Contractor, or the Association, as may be the case, prior to submitting the matter to the Committee. The party alleging a dispute or violation shall give notice to the applicable Contractor, the Union, or the Association, as may be the case, within ten (10) working days of the alleged occurrence of the violation, or discovery of the alleged violation. Discovery of the alleged occurrence shall be limited to the date in which the grieving party can be reasonably expected to be aware of the alleged violation. The parties shall arrange to meet within thirty (30) calendar days, unless otherwise mutually agreed. If the applicable contractor or Association, as the case may be, fails to meet within such time the requirement to so meet is waived.

   (b) In the event the Committee agrees on a resolution of the dispute, said resolution shall constitute a decision that is final and binding on the parties.

   (c) If the Committee resolves a dispute involving a claim of discharge without cause or other claim of an employee against a contractor, the Committee's decision shall be put in writing and must be complied with within 30 days after the contractor receives a written copy of the Committee's decision. If the contractor does not comply within 30 days after receipt of the written decision, the contractor shall be liable for the Union's costs and reasonable attorney's fees incurred in bringing a court action to enforce the Committee's decision, plus interest and liquidated damages in the amount of two hundred fifty ($250.00) dollars per calendar day starting 30 days from the date of receiving the Committee's decision until the decision is fully complied with.

   (d) In the event the Committee cannot adjust such dispute after three meetings, the matter shall be referred to the American Arbitration Association for selection of an impartial arbitrator to render a final and binding decision. The cost of arbitration (Arbitrator's fee, American Arbitration Association fees and any transcript fees) shall be shared equally between the Union and the MSCA of New York. All notices of the dispute

must be made known by either signatory within 30 days.

ARTICLE XXII
Welfare Fund

1. The employer from July 1, 2021 to June 30, 2025 inclusive agrees to pay to the Trustees of the Welfare Fund of the Metal Trades Branch Enterprise Association Local Union 638 the sum of $530.33 per month per each employee and an additional nine dollars and twenty cents ($9.20) per paid hour per each employee covered by the terms of this Agreement. Holiday, sick or vacation time shall be considered hours paid for the purpose of this Article. The employers are required to make contributions on behalf of all employees performing work described in this agreement including newly engaged or newly hired employees referred to in Article III, Section 2 and Article VIII, Section 1 from the first hour of their employment.

2. Such Fund has been established by an Agreement and Declaration of Trust established July 1, 1965 to which the employer agrees to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of the said Trust, from time to time, to be bound by and comply with all provisions of said Agreement and Declaration of Trust, as the same exists or may during the term of this Agreement be amended in accordance with its terms.

ARTICLE XXIII
Pension Fund

1. The employer from July 1, 2021 to June 30, 2025 inclusive agrees to pay to the Trustees of the Metal Trades Branch Local Union 638 Pension Fund contributions in accordance with the following schedule:

PENSION Per Paid Hour

July 1, 2021 to June 30, 2025

Journeyperson:	$6.75
4th year:	$6.03
3rd year:	$5.38
2nd year:	$4.83
1st year:	$4.33

(including newly engaged or newly hired employees)

Holiday, sick or vacation time shall be considered hours paid for the purpose of this Article.

2. Such Fund was established by an Agreement and Declaration of Trust dated July 1, 1965, and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust from time to time and to be bound

by and comply with all the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

ARTICLE XXIV
Industry Promotional Fund

Every employer shall during the term of this agreement pay fifteen ($.15) cents per hour for each hour paid not to exceed 40 hours per week for employees covered by this Agreement to the Service Fitters Industry Promotional Fund of New York. Such Fund was established by a Declaration of Trust dated November 23, 1983 and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust from time to time, and to be bound by and comply with all provisions of said Declaration of Trust.

ARTICLE XXV
Industry Educational Fund

Every Employer shall pay the following amounts per hour for each hour paid, not to exceed forty (40) hours per week, for employees covered by this Agreement to the Service Fitters Industry Educational Fund: From July 1, 2021 to June 30, 2025 thirty-five ($.35) cents; Such Fund was established by a Declaration of Trust dated December 31, 1987 and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said trust, from time to time, and to be bound by and comply with all the provisions of the Declaration of Trust, as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Upon approval by the State of New York and the Trustees of the Educational Fund, an Apprenticeship program will be established in addition to the existing Service Technicians Training Program.

ARTICLE XXVI
United Association International Training Fund

Every employer shall during the term of this agreement pay ten ($.10) cents per hour for each hour paid, not to exceed 40 hours per week, for employees covered by this Agreement to the United Association International Training Fund.

ARTICLE XXVII
Cash Security Deposit and Fund Payment Requirements and Administration

Section 1. Cash Security Deposit. Each employer that is delinquent in making contributions three (3) or more times during the term of this agreement shall produce a cash security deposit to the joint benefit of the Trustees of the Metal Trades Branch Local Union 638

Pension Fund, the Metal Trades Branch Local 638 Welfare Fund, the Service Fitters Industry Educational Fund and the Service Fitters Industry Promotional Fund of New York (the "Funds"), guaranteeing payment to said Trustees, jointly and severally, of any and all amounts due from said Employer to each or all of the Funds, pursuant to the terms of this Agreement.

Such cash security deposits shall be held by the fund office.

The amount of such cash security deposit shall be an amount equal to the average of contributions due from such employer for three (3) months before the delinquency that causes the application of this requirement.

Section 2. **Time payments due; interest; remedies.** Contributions are due on a monthly basis; each Employer will make the required Fund payments provided for in this Agreement within ten (10) calendar days following the end of each month, e.g. for the month of January the Fund payments must be received by the Fund Office no later than February 10th.

With respect to any payments not made within twelve (12) calendar days after the required time, an Employer will pay interest at the rate of 3% (three percent) per annum above the prime interest rate of July 1st of that fiscal year as published in the New York Times ("the Contractual Rate of Interest") rounded to the nearest whole percent but not higher than the maximum rate, if any, fixed by Section 5-501 of the New York General Obligations Law from the date due. Interest due under this paragraph is a payment due the Funds and failure to pay such interest shall constitute a delinquency within the meaning of this Article.

Where a contractor is required to provide a cash security deposit and does not, and/or is delinquent more than three (3) times during the term of the Agreement and/or issues a check to the Funds which is returned "unpaid for insufficient funds", "uncleared funds" or as to which the Employer stopped payment, the Trustees, through Chairman and Co-Chairman or a sub-committee of Trustees designated by them, have the authority to direct an Employer to make Fund payments by means of Certified Check, Bank Check or Money Order. Any Employer that fails to pay by Certified Check, Bank Check or Money Order when so directed, shall be deemed delinquent within the meaning of Article XXVII, Section 4, and the Union may refuse to permit employees to work for such Employer.

Reporting of Fund payments by employee's name and social security number in a format approved by the Trustees shall be submitted at the same time as payments are due.

In addition to any other action the Funds may be empowered to take, the Funds may bring an action pursuant to Sections 502 (g) (2) and 515 of the Employee Retirement Income Security Act of 1974, as amended, to enforce the Employer's obligation to make contributions. In any action under the preceding sentence in which judgment is awarded in favor of the Funds, such judgment shall award the Funds: the unpaid contributions, and interest at the Contractual Rate of Interest, and as liquidated damages an amount equal to 20 percent of the said unpaid contributions as determined by the court, and reasonable attorney's fees, audit fees and costs of the action, and such other legal or equitable relief as the court deems appropriate. Nothing in the foregoing two sentences shall be construed as a waiver or limitation on the Funds' or the Trustees' rights to enforce an Employer's obligation to contribute in any other type of

proceeding against the Employer and/or its shareholders and/or its officers.

In the event an Employer is delinquent hereunder as defined above in this Article, including contributions due, interest as required by Section 2, Paragraph 2 and cash security deposit as required by Section 1, the Funds, in their sole discretion, may initiate arbitration proceedings to obtain appropriate relief. The Funds may bring an arbitration proceeding hereunder to collect delinquent contributions, and/or interest due required by Section 2, Paragraph 2 and/or to obtain the posting of a cash security deposit as required by Section 1. The parties specifically agree that any claim made by the Funds based upon any such delinquency may be initiated by the Funds upon fourteen (14) days written notice of intention to arbitrate by registered mail or certified mail to the last address of the Employer on record with the Fund Office, and to Roger Maher, as Arbitrator, or such other Arbitrator as the Trustees may from time to time select, to be settled by arbitration in accordance with the Voluntary Labor Arbitration Rules of the American Arbitration Association, except as otherwise provided herein and judgment upon the award rendered by the Arbitrator may be entered in any court having jurisdiction thereof and shall be final and binding upon the parties. Should the Employer fail to appear, together with his payroll records for the period of delinquency in question, the Arbitrator may find against the Employer by default. In any case in which the Arbitrator finds that the Employer is indebted to the Funds, the award shall include: the unpaid contributions, and interest on unpaid or tardily paid contributions at the Contractual Rate of Interest; and as liquidated damages an amount equal to 20% (twenty percent) of the unpaid contributions as well as any sums due pursuant to Section 4 of this Article; and reasonable attorneys' fees, audit fees and costs of collection, and such other legal and equitable relief as the Arbitrator deems appropriate. It is specifically agreed by the Employer that in any case in which the Funds serve a notice of intention to arbitrate (or demand for arbitration) which results in a notice of hearing being issued by the Arbitrator, contributions for all months which are claimed as due by the Funds as of the notice of intention to arbitrate as well as contributions for all months claimed as due by the Funds through the date of the arbitration hearing or adjourned date, if any, shall be subject to such arbitration. Once the notice of the hearing is issued, payment of the sums claimed in the notice of intention to arbitrate and all sums claimed as becoming due thereafter in accordance with the preceding sentence, will not be deemed to have been made until the Fund Office receives such sums in the form of cash, certified check or an uncertified check which the Fund Office determines has cleared prior to the arbitration hearing; the Fund's judgment as to the time for clearing of a check shall be conclusive. An Employer to whom a demand for arbitration has been mailed may avoid payment of liquidated damages, attorneys' fees and arbitration fees by payment of an administrative fee for legal, administrative and/or arbitration costs as follows: if all fringe benefits claimed in the demand for arbitration are paid, with interest, prior to the arbitrator mailing a notice of hearing, the administrative fee is TWO HUNDRED DOLLARS ($200); if the notice of hearing has been issued by the arbitrator, and all fringe benefits claimed by the Funds as due as of the date of hearing have been paid, with interest, the administrative fee is FOUR HUNDRED DOLLARS ($400), if paid more than twenty-four (24) hours prior to the scheduled starting time of the hearing and SIX HUNDRED DOLLARS ($600) if paid prior to, but less than twenty-four (24) hours before the scheduled starting time of the hearing. Initiation of the aforesaid arbitration procedure shall not preclude the Funds from pursuing any other remedy or remedies available to them including other remedies against the Employer and/or its officers and/or its shareholders. It is expressly understood and agreed that the arbitration provision herein shall not be an exclusive remedy.

At the option of the Funds, suit may be brought by the Funds against the Employer (a) in the Southern District or Eastern District of New York in the case of Federal court action by the Funds, or (b) in the courts of the State of New York, in which event the Counties of New York or Nassau are deemed proper venue, and the law of the State of New York shall apply except that federal law shall apply as to the remedies available through arbitration. It is agreed that the Funds may sue collectively or individually in their own name or, alternatively, in the name of the Administrator and at least one Employer Trustee and one Union Trustee from each of the Funds.

Section 3. **Audits.** The Trustees may at any time direct a payroll audit of any Employer to verify the Fund payments. Failure by any Employer to permit such audit within a reasonable time from receipt of a written demand by the Fund Office, mailed to the Employer by registered mail, return receipt requested, to conduct such audit, or to submit the reports of payments due to the Fund Office in accordance with the requirement of Article XXVII, shall constitute a breach of this Agreement.

The Trustees shall notify the appropriate Enterprise Association officials of all delinquent Employers, including Employers who are not in compliance with the cash security deposit, auditing and reporting requirements hereof, for action as provided for in Article XXVII, Section 4. All cash security deposits furnished under this Article shall provide for payment of the Employer's obligation to pay the interest provided herein per annum of any delinquent Fund payments or wages and for the reasonable expense for collection including liquidated damages, audit fees and attorney fees in addition to the principal amount.

Section 4. **The Union May Withdraw Employees from Delinquent Employers.** The Union may refuse to permit employees to work for any Employer who is delinquent in either wage or Fund payments or who fails to submit signed and timely reporting forms to the Fund Office in the format and at the times required by the Trustees, or who fails to permit the Fund Office to conduct a payroll audit, or who is delinquent in the furnishing of a cash security deposit or certified check required under this Agreement or who fails to pay interest as required by Section 2, Paragraph 2.

When an Employer's delinquency in Fund payments causes the Union to remove employees from that Employer on more than one occasion in a ninety (90) day period, said Employer shall pay one day's wages including fringe benefits to each employee who was removed from the job.

ARTICLE XXVIII

Should any part of this Agreement be held to be illegal by a Court of competent jurisdiction or other governmental agency, such part shall immediately be eliminated but shall not otherwise affect the validity or enforceability of any other part.

It is understood that reference herein to the male gender, such as "he", "him" or "man" are for the purposes of brevity only and shall be understood to include the corresponding terms "she", "her" and "woman".

ARTICLE XXIX

The parties agree to adhere to the tenets of the United Association Standard of Excellence.

IN WITNESS WHEREOF, the parties named have caused their proper representatives, having full power to sign these presents:

For the Metal Trades Branch of Local Union 638 of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada.

Metal Trades Branch Local 638

Alex Charalabakis

Patrick Dolan

Nicolo Lentini

James Moriarty

Daniel Mulligan

Michael Mulvaney, Chairman

For Mechanical Service Contractors Association of New York, Inc.

Mechanical Service Contractors Association

Scott Berger, Chairman

Salvatore Manfredonia

Jerome Morreale

Daniel Steffen

ADDENDUM TO OFFICIAL WORKING AGREEMENT

BETWEEN THE MECHANICAL SERVICE CONTRACTORS ASSOCIATION

OF NEW YORK, INC.

AND

ENTERPRISE ASSOCIATION METAL TRADES BRANCH

LOCAL UNION 638 OIL BURNER SHIFT

1. On all service work the second shift shall consist of oil burner technicians only.

2. The employer shall be at liberty to establish an additional shift above the regular working day for a duration of eight (8) hours at regular wage plus shift premium with one (1) hour meal break allotted as a non-paid work break. These designated shifts shall terminate at 7:00 p.m. daily in all cases.

3. Any hours worked prior to or after the start and finish time of a shift shall be paid at the rate of time and one half. Shift schedules shall be for a minimum period of one week each and the employees designated to work shall be notified a minimum of 48 hours prior to the commencement of such designated starting time. Any employees working such shifts shall be paid twenty five ($.25) cents above the prevailing hourly rate.

4. It is further agreed the employer may establish a second shift schedule for the purpose of emergency service starting at 12:00 noon until 9:00 p.m. on the same day with one hour off for supper. Any employee assigned to work pursuant to this schedule shall be paid at the rate of time and one half for all work performed prior to the scheduled starting time and/or after scheduled quitting time.

5. All time worked on Saturdays, Sundays and holidays shall be paid at the prevailing overtime rate period.

6. All service work on the shift schedule shall be performed only by Journeymen Technicians. On calculating overtime payments, the shift premium shall be included.

7. This stagger work system shall be on a rotating basis.

8. Any work performed during the hours of 7:00 p.m. Friday to 8:00 a.m. Monday shall be paid in accordance with this agreement. Any work performed on a Saturday which is not a legal holiday shall be paid at the rate of time and one half. Any work performed on Sundays or on New Year's Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day, or Christmas Day shall be paid for at the rate of double time. Any work performed on the federally designated holidays (Martin Luther King, Jr.'s Birthday, President’s Day,

Memorial Day and Columbus Day) shall be paid double time.

9. No shift shall be worked on a holiday, Saturday or Sunday.

10. The vacation period for employees engaged in oil burner work shall be between May 15th and September 15th or as mutually agreed upon.

TRADE AGREEMENT

Between

ENTERPRISE ASSOCIATION
LOCAL UNION 638

Steam, Hot Water, Hydraulic, Sprinkler, Pneumatic Tube, Ice Machine and General Pipe Fitters of New York and Vicinity, Local Union No. 638 of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada

and

MECHANICAL CONTRACTORS ASSOCIATION
OF
NEW YORK, INC.

Effective July 1, 2021

Terminates June 30, 2023

FORWARD

The Association and Employers hereby recognize Steamfitters' Local Union 638 of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada as the sole and exclusive bargaining representative for all their employees performing any work covered by this Agreement and employed by the employer in the geographical jurisdiction of the Enterprise Association, namely, the City of New York, Nassau and Suffolk counties and all of Long Island. This Agreement together with its Working Rules shall govern all steamfitting work performed under this Agreement by any contractor party to or bound by and subject to this Agreement within the trade jurisdiction as set forth herein.

INDUSTRY MISSION

It is the mission of Enterprise Association Steamfitters Local Union 638 and the Mechanical Contractors Association of New York, Inc. to build the finest mechanical and fire suppression systems in New York City, Nassau and Suffolk Counties. Our efforts will include providing highly skilled, productive craftsmen working a fair day's work for a fair day's pay.

Employers will seek to promote the industry and support continued education and training for all personnel and build the safest and most efficient projects possible for our customers.

Together, the Union and the Employers pledge to continue to provide the most cost effective, productive and highest quality work anywhere in the industry.

It is our hope that the adoption of this Standard for Excellence will be the benchmark for the industry now and in the future.

RULES

Rules of the Enterprise Association applying to work at the steamfitting trade and its many branches, in the City of New York and in Nassau and Suffolk Counties, New York and all of Long Island.

Rule I.
WORKING DAY

Section Ia. The hours of labor shall be seven (7) hours per day to be performed between six (6:00) o'clock A.M. to three-thirty (3:30) o'clock P.M., as reasonably designated by the Employer with the consent of the Union, every day for the entire work force, except Saturday and Sunday and legal holidays. The Employer shall notify the Union twenty-four (24) hours prior to the start of any job which starts at any other time than eight (8:00) o'clock A.M. Once the Employer has designated a starting time for a job, it may not be changed without the consent of the Union.

Section Ib. If a contractor has not designated a 6:00 o'clock A.M. start as per Rule I, Section Ia., and when burning, welding, soldering, chopping, core boring, drilling or material deliveries are required by the owner of an occupied building to be done before the regular hours of labor, with the request of the Employer and with the consent of the Union, the hours of labor shall be seven (7) hours per day to be performed between six (6) o'clock A.M. and one-thirty (1:30) o'clock P.M. with the first hour to be paid at a fifty (50%) percent differential of the regular rate of wages, including fringe benefits.

Section II. No steamfitter or apprentice shall be allowed to apply to any shop or office for employment except between the hours of eight (8:00) o'clock A.M. and three-thirty (3:30) o'clock P.M.

Section III. If a steamfitter is employed on Temporary Heat, the shift shall consist of eight (8) hours or eight and one-half (8 ½) hours as applicable. One or more of these shifts may be used.

Section IV. Each shift shall be known as the working day for temporary heat, every day including Saturday, Sunday and legal holidays.

Section V. The working days above named shall be known as regular time and shall be time actually employed at work.

Section VI. Shift Work may be performed during other than the regular working day as defined in Section I. All Shift Work shall be performed in accordance with Rule XV.

Section VII. Where licenses are required, no steamfitter or apprentice should knowingly work for any unlicensed contractor.

Rule II.
RATE OF WAGES

Section I. Regular time for a steamfitter except as noted in Section II of this Rule shall be paid for at the following rates:

From July 1, 2021 to June 30, 2022, $60.80 per hour ($425.60 per day of seven (7) hours) plus $18.75 per hour Welfare, $20.40 per hour Pension, $7.00 per hour Vacation, and $11.25 per hour Security Benefit Fund.

In addition to the above each employer shall pay $.74 per hour Educational Fund for each and every hour worked and 1% per hour of the Journeyman Steamfitter wage rate less fringe benefits into the Industry Promotion Fund for each and every hour worked. (See Rules XVIII, XVIII-B, XIX, XIX-B, XX, XXI, XXII, XXIII, XXIII-A and XXIII-B.)

ADDITIONAL INCREASES

July 1, 2022 to June 30, 2023 $2.25

NEW YORK CITY PAID SICK TIME ACT. The contributions made in this section are made in lieu of paid sick days to the employees. By the Parties agreeing to this provision, they expressly waive the provisions of the New York State Paid Sick Leave Law and the requirements under Section 196-b of New York State Labor Law, the New York City Paid Sick and Safe Leave Law, or comparable legislation that may be enacted by any local, state or federal government on the basis that comparable benefits are provided to the employees covered by this collective bargaining agreement in the form of contributions into various funds in lieu of paid days off.

The money increases stated above are all inclusive, that is, it includes wage increases and Pension, Welfare, Vacation, Security Benefit, and Supplemental Retirement Plan 401(a**)** contributions respectively; the contributions of $.74 on each hour worked to the Educational Fund and 1% per hour of the Journeyman Steamfitter wage rate less fringe benefits to the Steamfitting Industry Promotion Fund of New York and Long Island are over and above the agreed upon package. There will be an additional $.06 per hour worked to the Building Trades per capita, $.03 per hour worked to the Industry Development Fund, $0.04 per hour worked to the Labor Management Cooperation Committee and $0.10 per hour worked to the United Association Training Fund. All are over and above the agreed upon package.

The regular hours of labor shall be seven (7) hours per day which is to be performed between the hours of six (6:00 o'clock A.M. and three-thirty (3:30) o'clock P.M. Fractions of days worked as a result of weather, safety, act of God, or circumstances beyond the control of the contractor shall be paid for at the same rate, but no steamfitter or apprentice shall be employed for less than two hours. The lunch period under this Section shall be one-half hour and at the option of the employer, and shall be between the hours of twelve (12:00) noon and twelve-thirty (12:30) o'clock P.M., or twelve-thirty (12:30) o'clock P.M. and one (1:00) o'clock P.M. If work starts before eight (8:00) o'clock A.M. the lunch period may be adjusted accordingly. No overtime shall be paid for labor performed during the regular working day. Any steamfitter being laid off will receive a minimum of 7 hours pay for the day of lay off.

Section II. The wages and fringes of steamfitters working on the operation and/or maintenance of temporary heat and/or temporary air conditioning shall be paid and increased proportionately in accordance with the steamfitters effective wage rate and fringe benefit payments.

No steamfitter operating and/or maintaining temporary heat shall be employed for less than an eight hour shift.

Section III. Apprentices shall be paid a progressively increasing schedule of wages as noted below based on the following percentages of the wage rate and fringes payable to journeymen steamfitters and subject to the provisions of Rule XX with respect to payments to Apprentices for attendance at classes:

1st year - 40% of a journeyman steamfitter rate of wages and all fringes

2nd year - 50% of a journeyman steamfitter rate of wages and all fringes

3rd year - 60% of a journeyman steamfitter rate of wages and all fringes

4th year - 70% of a journeyman steamfitter rate of wages and all fringes

5th year - 80% of a journeyman steamfitter rate of wages and all fringes

Wherever Trainees are employed they shall be paid in accordance with the above apprenticeship rates.

Section III A. When apprentices are available, a contractor must hire one apprentice for each six (6) workers on a jobsite, e.g., six (6) workers, one (1) worker must be an apprentice; twelve (12) workers, two (2) workers must be apprentices, etc.

Section IV. When shift work, as defined in Rule XV, or in Rule XV (f) and (g) of the Public Works

Supplement, is performed steamfitters and/or apprentices shall be paid the wage rate and fringe benefit contribution rate for regular time worked plus a fifteen percent (15%) premium on both wages and fringe benefit contributions.

A shift shall be worked for a minimum of five (5) days Monday through Friday.

Shift work shall be worked for a minimum of three (3) days Monday through Friday when working at a college or university.

Section V. When the sixth (6^{th}) steamfitter is employed on a particular job, a Foreman's rate of Two Dollars ($2.00) per hour, in addition to the regular rate of wage for a journeyman steamfitter, shall be paid to the steamfitter on that job who is designated by the Employer as the Foreman.

Rule III.
RATE FOR OVERTIME AND HOLIDAYS

Section I. Any work done between three-thirty (3:30) o'clock P.M. and six (6:00) o'clock A.M. or seven (7:00) o'clock A.M. as stated in Rule I, Section I, and on Saturdays (with the exception stated in Rule I, Sections III and IV), Sundays, New Year's Day, Presidents' Day, Memorial Day, Fourth of July, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day and Christmas Day, shall be paid for at double the rate for regular time, commencing at the hour at which the steamfitter reports for work by direction of the Employer. The hours of labor for weekends or holidays shall be no less than seven (7) hours at double the rate. Fractions of days worked as a result of weather, safety, act of God, circumstances beyond the control of the contractor or if previously agreed to between the union and the employer, shall be paid for the same rate, but no steamfitter or apprentice shall be employed for less than two (2) hours at double the rate. In all cases, the holidays described herein will be observed on the day and date established by the State of New York.

On jobs shut down for safety reasons by a governmental agency and beyond the control of the union and the employer, steamfitters shall be paid only for hours worked at the time of the shut down. If the job remains shut down for safety reasons for 48 hours or more, steamfitters may be transferred to another job or laid off by telephone. If a lay off occurs due to a job being shut down for safety reasons, the steamfitter shall not receive compensation for any hours not worked.

In the event a job site is closed for a holiday not specified herein the Employer can either transfer the Employees to another job site or arrange for overtime work to compensate the Employee for any time lost. If the Employees are not transferred or paid overtime then the Employees shall be paid regular time wages

for the time lost. Overtime will be made available within five (5) working days preceding or following the holiday or holy day.

No overtime shall be paid for labor performed during the regular working day.

Section II. Except for Shift Work when it is not convenient to start work until between the hours of eleven (11:00) o'clock P.M. and four (4:00) o'clock A.M., then the steamfitter's time shall commence at eleven (11:00) o'clock P.M. and continue until said work is completed. Under these conditions, no steamfitter shall receive less than one (1) day's pay regular time.

Section III. The Employer will give Employees 24 hours' notice of scheduled overtime requirements for weekend work. All emergency overtime will be worked as required.

Rule IV.
METHOD OF PAYMENT

Section I. All steamfitters and apprentices shall be paid at quitting time in cash on Thursday or by check on Wednesday for the week ending the Tuesday prior at the option of the employer. A two hour penalty of wages and benefits will be paid in the event a steamfitter does not receive wages due him on pay day, except for extenuating circumstances as agreed by the Joint Trade Board.

If wages are paid by check, the Employer must be in compliance with the requirements of Rule XXIV of this Agreement. Payments to be made at the option of the Employer, either on the job or at the shop. When a steamfitter or apprentice is laid off or discharged or not put to work, he shall at once be paid the wages due him in cash.

If an Employer has permission to pay by check, he shall have authorization to lay off by check.

Section II. The Union may refuse to permit employees to work for any employer who is delinquent in either wage or fund payments or who fails to submit signed and timely reporting forms to the Fund Office in the format and at the times required by the Trustees, or who fails to permit the Fund Office to conduct a payroll audit within 10 days from the receipt of written demand by the Fund Office, mailed to the Employer by registered mail, return receipt requested, to conduct such audit, or who is delinquent in the furnishing of a bond or certified check, required under this Agreement.

When an employer's delinquency in fund payments causes the Union to remove employees from that employer's jobsites more than once in a ninety (90) day period, said employer shall pay one day's wages including fringe benefits to each employee who was removed from the job.

Section III. The checks issued for wages by all Employers who have received permission to pay by check shall meet the following conditions:

A. The Employer's bond shall be in compliance with the requirements of Rule XXIV.

B. Checks must be drawn on a bank with a branch in New York.

C. The Steamfitting Industry Promotion Fund will guarantee the payment of all bad checks, and will issue an additional check in the amount of $250 for any inconvenience due to a bad check issued to the steamfitter or apprentice. The payment will be provided by the Promotion Fund within 96 hours from when the Promotion Fund is notified. Steamfitters must notify the Promotion Fund within 45 days of the check having been issued.

D. Employers who are delinquent in fringe benefit payments under this contract in excess of one-half of their bond will have their check payment privilege suspended until reapproved by the Joint Trade Board.

Section IV. The Employers recognize and shall administer a checkoff system for payment of work dues from Building Trades journeyman and apprentice steamfitters to the Union who voluntarily sign a written authorization card in the form provided by the Union.

Section V. At the option of the employer, subject to the approval of the steamfitter or apprentice, wages may be paid by direct bank transfer. If so elected, wages due at layoff may be paid by the same method.

Rule V.
STEAMFITTERS TO WORK IN UNITS OF TWO

All work to be performed within the jurisdiction of Enterprise Association must be performed by journeymen steamfitters or apprentices working in units of two, one of whom must be a steamfitter. A unit shall consist of:

A. Steamfitter with a steamfitter, or

B. Steamfitter with an apprentice.

Rule VI.
WHERE STEAMFITTERS AND APPRENTICES ARE TO BE AT STARTING TIME

Each steamfitter and apprentice shall be paid from the time at which he leaves the job shanty at the beginning of work within the territory of Greater New York and all of Long Island and there shall be no board or carfare

paid to steamfitters or apprentices working in said territory.

A steamfitter who is sent to work outside of the above noted territory shall take the boat, train or car leaving either of the extreme points of the territory, as directed by his employer, going on boat, train or car leaving nearest starting time and returning take the boat, train or car arriving nearest quitting time.

Rule VII.
EXPENSES ALLOWED TO STEAMFITTERS

Each steamfitter working outside of the limits described in Rule VI shall receive from his employer traveling expenses to and from the place at which the work is located for as many trips as he is directed by his employer to make. He shall also receive a reasonable amount of board paid by him and he shall receive regular wages for all regular time consumed in traveling.

If the steamfitter leaves his work before it is completed and without the consent of his employer, it shall be at his own time and expense.

The Steamfitting Industry Promotion Fund shall pay to steamfitters the total sum of four-hundred ($400) dollars for successfully passing any welders qualification test taken after the normal working day at the Industry Training Center. This reimbursement shall be paid no more than once per requalification period, as determined by the Department of Buildings or any other governing agency.

Rule VIII.

In going from his shop to his work, or from his work to the shop, a distance of more than one mile, each steamfitter or apprentice shall receive from his employer the necessary fare.

Rule IX.
CUTTING, MAKING UP FITTINGS AND FIRE STOPPING

Section I. All pipe except sprinkler work may be cut, threaded, grooved and have fittings made up by hand or machine on the job or in the shop of the direct employer at the option of direct employer. If the said shop is a permanent shop, equipped with permanently installed pipe cutting and threading machinery, then the work shall be done by a steamfitter working alone. When a direct employer has no permanently installed pipe cutting machinery in his shop, such work shall be done in accordance with Rule V on the job or in a shop employing steamfitters in accordance with Rule V.

Pipe five (5") inches and over at the option of the direct employer, may be cut, threaded or grooved in the shop of the direct employer or in a shop employing 638 steamfitters working in accordance with Rule V.

Specialty Pipe of all diameters can be ordered from a supply house cut to a convenient length that shall be at a minimum four (4") inches longer than its final fabricated length. Pipe so ordered will have a maximum of one (1) mill bevel, thread or groove. The other end shall have a machined or burned cut.

HVAC pipe, schedule 40 or heavier, 4 inches and under, can be ordered from a supply house in half-lengths grooved, beveled or threaded on both ends.

Section II. All combination sprinkler/standpipe systems exclusive of cross mains, stringers and fire hose stations and connecting pipe to same may be cut, threaded or grooved, in the shop of the direct employer or on the job at the option of direct employer. If the said shop is a permanent shop, equipped with permanently installed pipe cutting and threading machinery, then the work shall be done by a steamfitter working alone. When a direct employer has no permanently installed pipe cutting machinery in his shop, such work shall be done in accordance with Rule V on the job or in a shop employing steamfitters.

All fittings above 2” on sprinkler work may be made up in the shop of the direct employer by a Steamfitter working alone or on the job in accordance with Rule V, at the option of the employer. The makeup of fittings up to and including 2” in diameter can be ordered from any shop. Prefabricated flexible sprinkler heads not to

exceed twenty-four (24) inches are permissible.

All types of chemical fire protection systems are the work to be performed by journeymen steamfitters and/or apprentices.

Welded outlets on sprinkler mains with yellow labels shall be allowed in Nassau and Suffolk Counties.

Section III. All pipe fabrication performed in a shop under Sections I and II must be labeled before leaving the shop. The journeyman performing the work must attach a label to the pipe showing the journeyman's name, signature, book number, name and address of the shop and date when work was performed to demonstrate that such work was done by a journeyman steamfitter within this bargaining unit and under the terms of this Agreement. Reproductions of the journeyman's signature will not be acceptable.

Labels shall be obtained by written application to Local Union 638 from individual employers. These labels shall be delivered by the Union to the steamfitter in charge of each shop, and he shall be fully responsible for the proper distribution of these labels.

Section IV. Radiator branches, convector branches and coil connections shall be cut, threaded, welded, brazed, glued, soldered or any other method of joining shall be done on the job by hand or machine in accordance with Rule V or in the shop of the direct employer using a steamfitter working alone, or at the option of the contractor in a shop employing 638 steamfitters in accordance with Rule V. Where so specified by the engineer, fan coil units may be delivered to the jobsite with factory pre-piped valve packages.

Section V. The erection and assembly of all pipe hangers and the erection only of supports and manufactured or fabricated structural attachments for work covered by this Agreement is the work of the steamfitter and apprentice in accordance with Rule V. Back to back channels, tube steel, and back to back angle iron suspended from structural attachments may be cut and/or welded in the shop of the direct employer or on the job in accordance with Rule V.

All threaded hanger rods shall be cut on the job or in the shop of the direct employer. Where plain hanger rods are utilized, the cutting and threading of rods under three quarter inch will be done on the job or in the shop of the direct employer.

Section VI. Pipe of all diameters can be ordered from a supply house cut into pieces for ease of access or handling and delivered to the job site. Pipe so ordered will not be cut to sketch and will have a maximum of one (1) mill bevel, thread or groove. The other end shall have a machined or burned cut.

Section VII. All pipe used for temporary heat which has been cut in the shop or on the job and subsequently removed may be used again.

Section VIII. All disconnecting and dropping to the floor of temporary piping used in construction is the work of the steamfitter.

Section IX. Fire Stopping of uninsulated pipe is the work of the Steamfitter.

Section X. Geothermal Piping is the work of the steamfitter within the scope of their jurisdiction.

Rule X.
WELDING

Acetylene, electric, fusion or other forms of cutting or welding fabrication shall be done on the job or in a shop at the option of the Employer in accordance with the conditions as set forth herewith.

Section I. All welding fabrication except for electric power generating plant installations shall be done by a steamfitter working alone in the shop of the direct employer, or shall be done in accordance with Rule V either on the job or in any other shop employing Local 638 Steamfitters and/or Apprentices.

On electric power generating plant installations over 100 megawatts all welding fabrication eight (8") inches and over shall be done in the shop of the direct employer or any other shop employing Local 638 Steamfitters

and/or Apprentices using Steamfitters working alone or in any other pipe fabrication shop having a signed agreement with the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada. Welding fabrication six (6") inches and under shall be done in the shop of the direct employer using Steamfitters working alone or in accordance with Rule V either on the job or in any other shop employing Local 638 Steamfitters and/or Apprentices.

A direct employer is a contractor who bids on a job directly for a public or private letting agency. If a direct employer bids and wins a job for erection and fabrication, it shall be done in accordance with Section I.

Section II. All pipe fabrication performed in a shop under this Agreement must be labeled before leaving the shop. The journeyman performing the work must attach labels to the pipe showing the journeyman's name, signature, book number, name and address of the shop and date when work was performed to demonstrate that such work was done by a journeyman steamfitter within this bargaining unit and under the terms of this Agreement. Reproductions of the journeyman's signature will not be acceptable.

Labels shall be obtained by written application to Local Union 638 from individual employers. These labels shall be delivered by the Union to the steamfitter in charge of each shop, and he shall be fully responsible for the proper distribution of these labels.

Section III. The fabrication of van stone joints, the making of hammer welds, or the welding of boiler headers, street steam headers, circular coils, trombone coils, zigzag coils, trunk coils, double pipe refrigerating machine coils, atmospheric type condensers, absorbers, weak liquor coolers and rectifiers of refrigerating machines may be done by the employer without reference to any jurisdiction by Enterprise Association. All other pipe welding is to be performed by journeymen steamfitters.

Section IV. There shall be no exception to this Rule unless an employer makes a specific request on a specific job which must be submitted to the Board of Arbitration for review, prior to start of job. If approved by the Board of Arbitration, approval shall be for that job only and shall not prejudice this Rule on any other work.

Rule XI.
TEMPORARY SERVICES

Section I. Except as described in Section VII, Steamfitters working alone shall have jurisdiction in the operation and/or maintenance of all temporary heat work at all times whenever temporary heat is on a building regardless of the source of heat supply. If the fire is banked or if no heat is in the radiators, steamfitters shall have no claim for temporary heat operation and/or maintenance. Steamfitters shall have no claim for temporary heat operation and/or maintenance in any building or structure or addition thereto that will have a total of 1,500 sq. ft. of equivalent direct radiation or less, exclusive of mains and risers installed in said building or structure or addition thereto when completed.

Section II. Before the commencement of any temporary services for providing heating or air conditioning on a project utilizing systems installed under this agreement, a pre-temporary services conference shall be held, with the Owner/General Contractor/Construction Manager, the Contractor and appropriate Local 638 Business Agent to establish the basic guidelines, rules and procedures with regard to any temporary services requirements for the project. Said conference shall be held at such time as to give all appropriate parties ample time to provide those services needed.

Section III. Each steamfitter shall conform to the schedule of shifts provided for each job and shall report to his predecessor on the job at least fifteen (15) minutes before the shift changes and no fitter shall leave his shift until he is relieved. The steamfitters shall not do any other work and shall not be permitted to work more than one shift in a twenty-four hour day.

Section IV. The steamfitter on a shift shall meet any emergency arising to the best of his ability and with the object of protecting the interests of his employer.

Section V. It is agreed that when temporary services are required, that in the interests of security and safety, those people required to maintain temporary services shall sign in with an appropriate party and keep all necessary "logs".

Section VI. Temporary services, if required, shall be continued until such time as an Owner/General Contractor/Construction Manager provides the contractor a letter of acceptance for the mechanical system.

Section VII. When steamfitters employed by the mechanical contractor are present on the job during the regular working day, no temporary services steamfitter will be required.

Section VIII. All construction offices, engineers' offices, sales offices and finished model apartments on the floor are not subject to temporary air conditioning services.

Section IX. Before temporary services shall be terminated for a project, the Owner/General Contractor/Construction Manager must provide the Contractor with a letter stating that he accepts the mechanical system for the project and agrees to operate and maintain the mechanical system for the project.

Section X. When temporary air conditioning is required by an Owner/General Contractor/Construction Manager for hours other than normal temporary heat shift hours, then a minimum of two shifts will be required.

Section XI. The temporary services committee is established as a standing committee and will meet periodically to review any disputes in this area and will make recommendations to the Joint Trade Board.

Section XII. An employer will not engage a steamfitter on the above type heating maintenance or temporary air conditioning who cannot produce satisfactory evidence that the steamfitter has fifteen (15) years of experience.

Rule XII.
TOOLS AND SHANTIES

Section I. The Employer shall provide all necessary tools required for the steamfitter to perform the work. The steamfitter shall comply with all Employer rules and regulations in the use and care of these tools, and promptly report any that are missing, destroyed, or in need of repair. There should be no restriction on the use of tools or installation methods, except that, where required, proper certifications shall be provided by the contractor to the steamfitters.

Section II. The Employer shall provide suitable shanties for dressing facilities on all jobs. These shall be heated during winter months and window air-conditioners or similar shall be provided during the summer months. Where these are prefabricated for job assembly, they shall be job assembled by steamfitters.

Section III. In the event an employee's working clothes are destroyed by fire or water during other than working hours, the Employer shall compensate the employee for the replacement of these articles, but in no event shall the amount for replacement exceed Five Hundred ($500.00) dollars per employee. In the event personal property, including street or dress clothes of an employee, are destroyed due to fire or water, during working hours, the amount of damage shall be limited to Five Hundred ($500.00) dollars.

Rule XIII.
EFFICIENCY OF STEAMFITTERS
NO DISCRIMINATION

Inasmuch as greater efficiency is desirable, both parties will encourage efficiency and discourage any discrimination in employment of workers on the basis of age and unreasonable limitations on the amount of work a Steamfitter can do.

The parties agree not to discriminate on the basis of race, creed, color, national origin, sex, age, disability, marital status, sexual orientation or citizenship, with regard to employment, wages or other terms and conditions of employment.

Rule XIV.
DUTIES OF A STEAMFITTER

The duties of a Steamfitter shall be such as are described under the heading "Duties of a Steamfitter" in the agreement made and entered into by and between the United Association and the Enterprise Association, March 24th, 1914, and copy hereto attached.

Rule XV.
SHIFT WORK
(Existing Buildings – Occupied or previously occupied)

Section I. When work is performed, as in Rule II, Section IV, in existing buildings which are or have been occupied, shift work may be performed at the option of the employer Monday through Friday, in accordance with the following:

a) A shift shall consist of seven (7) working hours. All work performed in excess of seven (7) hours shall be paid at double the rate for regular time. No shift shall commence after 7:00 P.M. on Friday or 7:00 P.M. the day before Holidays. All work performed after 12:01 Saturday or 12:01 the day of a holiday will be paid at double the rate for regular time.

b) Starting time for each shift shall be designated by the Employer.

c) A steamfitter or apprentice who has worked during the same regular workday shall not be assigned to shift work.

d) The Employer shall notify the Union 24 hours prior to the start of shift work.

e) A steamfitter or apprentice shall not work more than one shift in a 24-hour period.

f) Pay for shift work shall be in accordance with Rule II, Section IV.

Rule XV-A
RIGGING

Steamfitters will do all rigging of their pipe-fittings-valves-equipment and all appurtenances and set all equipment when no license is required.

If a master rigging license is required by law and if the contractor who is party to this agreement holds a master riggers license and is the direct bidder or sub-contractor on the job, this work will be done by steamfitters.

If the said contractor has no license, steamfitters will work in composite crews with the trade holding the license when required by law. Once the equipment and appurtenances are landed on the floor and in a safe position, the steamfitters will move and set this equipment to its final destination. Truck deliveries will be taken from the sidewalk or truck dock by the steamfitter into the building.

There shall be no exception to this Rule unless an employer makes a specific request on a specific job which must be submitted to the Board of Arbitration for review, prior to start of job. If approved by the Board of Arbitration, approval shall be for that job only and shall not prejudice this Rule on any other work.

Rule XV-B.
SUB-CONTRACTING

1. All work covered under this agreement if sub-contracted, will be sub-contracted to a contractor signatory to this Agreement.

2. Any work that has been sub-contracted from signatories to this Agreement shall not be re-subcontracted.

3. It is the intent of this Agreement that sub-contracted work shall be all inclusive of labor, materials, tools, etc., required for this work and not be labor only contracts. Where testing, flushing, or chemical treatment is included in the prime contract then it shall be included in the subcontracted piping work.

4. The letting contractor shall notify the Fund Office, in writing, on a form provided by the Fund Office of his intent to sub-contract work. This notification must take place individually for each job subcontracted and before commencement of work by Local 638 members on the project being subcontracted. Effective January 1, 2022, Failure to properly notify the Fund Office may result in a penalty bond amount as per Rule XXIV. Local 638 or the Employer's Association may notify the Board of Arbitration of any failure by a letting contractor to properly notify the Fund Office. The Board of Arbitration shall review the complaint in a timely matter and may determine to require said employer to increase their bond. The maximum penalty bond required shall be quadruple the base bond amount required.

5. The contractor who opts to sub-contract will assure compliance of Rule XXIV of the Collective Bargaining Agreement.

6. The Fund Office shall notify the letting contractor and the Union if the sub-contractor becomes delinquent.

7. Fabrication sub-contracting shall be subject to Rules IX and X.

Rule XV-C.
DOUBLE BREASTING

To protect and preserve, for the employees covered by this agreement, all work they perform and all work covered by this agreement, and to prevent any device or subterfuge to avoid the protection and preservation of such work, it is agreed as follows:

If contractor performs on-site construction work of the type covered by this agreement, under its own name or the name of another, as a corporation, company, partnership, or other business entity, including a joint venture, wherein the contractor, through its officers, directors, partners, owners, or stockholders exercises directly or indirectly (including but not limited to management, control, or majority ownership through family members), management, control or majority ownership, the terms and conditions of this agreement shall be applicable to all such work. This rule is for a period commencing July 1, 2021 to June 30, 2022. This rule shall be evaluated by the joint trade board and can be extended for one (1) year periods if agreed to by the joint trade board (there shall be no arbitration to resolve any lack of agreement).

Rule XV-D
PUBLIC WORKS SUPPLEMENT

There is a separate Works Supplement applicable to any public works project (Federal, State, City) done under prevailing rate laws, and is applicable to HVAC and mechanical contracts with a dollar value not to exceed Thirty Million Dollars ($30,000,000) and to fire protection/sprinkler contracts with a dollar value not to exceed Three Million Dollars ($3,000,000) and to other projects subject to the approval of the Joint Trade Board. The Supplement is for a period commencing July 1, 2021 to June 30, 2022; the Supplement is to be evaluated by the Joint Trade Board and can be extended for one (1) year periods only if agreed to by the Joint Trade Board (there shall be no arbitration to resolve any lack of agreement).

If a job is bid under the Supplement then the terms of the Supplement remain in effect for that job until its completion. The second paragraph to Article X shall not apply to Supplement.

Rule XV-E
JURISDICTIONAL CLAIMS

The employer agrees to recognize the jurisdictional claims of Steamfitters Local 638 and of the United Association of Journeyman and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada ("United Association") that have been established in their Constitutions and By Laws, by agreements with other crafts, awards contained in the Green Book, or as a result of decisions by the National Joint Board for the Settlement of Jurisdictional Disputes, or its successor or which are recognized as being the jurisdiction of the United Association and Steamfitters Local 638 and further agrees to assign all such work to Steamfitters, to the extent the Employer has the ability to assign such work, subject to the 1914 Agreement, existing practices and

agreements, and future jurisdictional decisions.

Section I. The installation of all types of hydrogen piping and related equipment for production, transport, storage, power generation, comfort heating and cooling, industrial feedstocks, process heat, fuel cell production and transportation fuels.

Rule XVI.
SERVICE WORK

When an employer subscribing to this Agreement employs members of Refrigeration and Air Conditioning Service and Maintenance Mechanics, Metal Trades Branch of Local Union 638, to perform refrigeration, air conditioning, air cooling, stoker and oil burner service work, such work shall be performed in accordance with the terms of a Trade Agreement in effect between the Contractors' Association and the Metal Trades Branch of Local Union 638 described above.

Rule XVII.
SHOP STEWARDS

Where the Employer employs four (4) or more units (as defined in Rule V) of Enterprise Association members on a job, then the Union shall send the 7th member to the job to act as Shop Steward, or the business agent may appoint one of the members being sent to the job by an employer, after being notified by the employer, prior to the members being sent to job.

If a member is sent to the job by the Union he will be selected from a group of members who are both interested and qualified to be Shop Steward. Any such Shop Steward shall be a working steamfitter who shall act in behalf of the interests of the Union and whose duties shall not interfere with the work he is employed to perform by the Employer.

If there is a complaint presented against the member acting as Shop Steward, either by the contractor or the members on the job, it will be addressed by the Business Agent, Business Agent at Large and the President within three (3) days of receipt of the grievance.

If said complaint was made by the contractor and was not rectified, then there shall be a Pre Trade Board Committee Meeting on the issue within seven (7) days of preliminary hearings.

The Shop Steward and his partner will be the third (3rd) to last unit employed on the job site. If the appointed Shop Steward leaves a job voluntarily, then the members on that job will select a new Shop Steward from the steamfitters on the job.

When the Employer of a Shop Steward has three (3) or more units working overtime on the job where the Shop Steward is employed, the Shop Steward and his partner shall be included in one of the units working overtime.

The steamfitter in charge shall be the Shop Steward whenever there is no appointed Shop Steward on the job.

When the Union or MCA believe a MCA Contractor is in violation of the Trade Agreement by lumping, paying employees off the books, employing employees out of classification to perform work covered by the Trade Agreement, or performing work in violation of Rule XV-C, the Union or MCA shall contact the Shop Stewards Committee which shall consist of two (2) members from each Association. The Shop Stewards Committee shall decide whether the Union will have the right to send the third member to each job as Shop Steward for a period of one (1) year for that contractor. If no agreement is reached by the Shop Stewards Committee, the Union and MCA may forward the matter to the Joint Board of Arbitration for a decision, which Board shall then meet within two (2) days. The final determination by the Joint Board of Arbitration shall be final and binding and not subject to Arbitration.

The Employer agrees not to discriminate in any way against any person so designated as Job Steward, either due to his being designated or to his activities in behalf of Enterprise Association and members.

Rule XVIII.
WELFARE FUND

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay to the Steamfitters' Industry Welfare Fund eighteen dollars and fifty cents ($18.50) per hour for regular time as set forth in Rule I, and thirty-seven dollars ($37.00) per hour for overtime as set forth in Rules I and III for work performed by each journeyman steamfitter. Apprentices shall be paid in accordance with Rule II, Section III. These payments shall be made for work performed by them in the City of New York and in Nassau and Suffolk Counties, N.Y., before any deductions are made for withholding or other taxes. Such Fund was established by an Agreement and Declaration of Trust, dated May 15, 1946, to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

The Welfare Fund Trustees shall allocate from employer contributions to the Welfare Fund such amounts as they determine from time to time to establish accounts for participants in the Health Reimbursement Account Fund of the Steamfitters' Industry Welfare Fund. The Welfare Fund Trustees shall establish a ceiling on the amounts to be so allocated which shall initially be $5,000.

Rule XVIII-B
HEALTH REIMBURSEMENT ACCOUNT FUND OF THE STEAMFITTERS' INDUSTRY WELFARE FUND

The parties hereto agree to establish by an Agreement and Declaration of Trust, The Health Reimbursement Account Fund of the Steamfitters' Industry Welfare Fund ("HRA Fund"), which shall be a sub-trust of the Steamfitters' Industry Welfare Fund. The purpose of the HRA Fund is to provide reimbursement of medical care expenses to Steamfitters and Apprentices employed under the Trade Agreement, and their spouses and dependents. The HRA Fund shall be jointly administered by three (3) Employer Trustees and three (3) Union Trustees. The Fund Trustees are authorized to contribute to the account of a participant in the HRA Fund amounts previously contributed under Rule XVIII and allocated to the account of a Participant under a plan providing health benefits. The Fund Trustees are authorized to enter in an agreement with the Trustees of the Steamfitters' Industry Supplemental Retirement Fund to direct a portion of amounts to be paid to the Trustees pursuant to Rule XVIII (including amounts allocated to Participants in the HRA Fund in excess of $5,000) to be directed to the Steamfitters' Industry Supplemental Retirement Fund. Any such agreement shall only apply to amounts paid subsequent to such agreement. Any such amount shall be considered an amount which was directly contributed to the Steamfitters' Industry Supplemental Retirement Fund.

Rule XIX.
PENSION FUND

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay to the Steamfitters' Industry Pension Fund twelve dollars and eighty-five cents ($12.85) per hour regular time as set forth in Rule I and twenty-five dollars and seventy cents ($25.70) per hour for overtime as set forth in Rules I and III for work performed by each journeyman steamfitter. Apprentices shall be paid in accordance with Rule II, Section III. These payments shall be made for work performed by them in the City of New York and in Nassau and Suffolk Counties, N.Y., before any deductions are made for withholding or other taxes. Such Fund was established by an Agreement and Declaration of Trust dated November 1, 1950, to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Rule XIX-B.
SUPPLEMENTAL RETIREMENT PLAN

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay to the Steamfitters' Industry Supplemental Retirement Plan seven dollars and fifty-five cents ($7.55) per hour regular time as set forth in Rule I and fifteen dollars and ten cents ($15.10) per hour for overtime as set forth in Rules I and III for work performed by each journeyman steamfitter. Apprentices shall be paid in accordance with Rule II, Section III. These payments shall be made for work performed by them in the City of New York and in Nassau and Suffolk Counties, NY, before any deductions are made for withholding or other taxes. Such Fund was established by an Agreement and Declaration of Trust dated January 24, 1997, to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement to be amended in accordance with its terms.

Rule XX.
EDUCATIONAL FUND

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay to the Steamfitters' Industry Educational Fund seventy-four (.74) cents per hour for each and every hour worked by journeymen and apprentice steamfitters employed in the City of New York, Nassau and Suffolk Counties, N.Y. Apprentices shall be paid in accordance with Rule II, Section III. Such Fund was established under date of August 14, 1952 and by Agreement and Declaration of Trust, dated May 1, 1960 to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Each apprentice will attend class for eight (8) hours on one (1) day every other week in compliance with the requirements of said Educational Fund and the employer of each such apprentice will pay to the apprentice who attends such classes for the requisite eight (8) hours, a total of seven (7) hours of wages and fringes based on the corresponding percentages due to such apprentice as stated in Rule II, Section III.

Rule XXI.
VACATION PLAN

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay to every journeyman steamfitter employed by them an additional wage in the sum of seven dollars ($7.00) per hour regular time as set forth in Rule I and fourteen dollars ($14.00) per hour for overtime as set forth in Rules I and III. Apprentices shall be paid in accordance with Rule II, Section III. This additional wage, less any requisite withholdings or deduction therefrom as required by law, shall be paid to the Trustees of the Steamfitters' Vacation Plan to be established for the account of the respective steamfitter or apprentice and in accordance with the appropriate rules and regulations to be established by such Trustees; which payments shall be disbursed by said Trustees only to the steamfitter or apprentice with respect to whom such payments have been made (less actual expense of formulating and administering the trust) as a vacation payment to said steamfitter or apprentice, and in accordance with such rules and regulations as may be adopted by the Trustees in furtherance of the objectives set forth in this rule.

Such Plan was established by an Agreement and Declaration of Trust dated July 1, 1953, to which the Contractors' Association and Enterprise Association were parties and all Employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Plan, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Rule XXII.
SECURITY BENEFIT FUND

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay into the Steamfitters' Industry Security Benefit Fund which was established by an Agreement and Declaration of Trust dated September 1, 1961 as a trusteed fund jointly administered in compliance with law the sum of eleven dollars and twenty-five cents ($11.25) per hour regular time as set forth in Rule I and twenty-two dollars and fifty cents ($22.50) per hour for overtime as set forth in Rules I and III for work performed by each journeyman. Apprentices shall be paid in accordance with Rule II, Section III. Said sums less actual expenses of administering the trust shall be held by the Trustees of said Fund for the benefit of the steamfitter or apprentice with respect to whom such payments have been made and applied in accordance with such plan as may be adopted by the Trustees. Such plan shall qualify under applicable provisions of the Internal Revenue Code to insure deductibility of said payments from taxable income of the employer.

Such Fund was established by an Agreement and Declaration of Trust, dated September 1, 1961, to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Rule XXIII.
INDUSTRY PROMOTION FUND

Every employer shall during the term of this Agreement pay one percent (1%) per hour of the journeyman steamfitter wage rate less fringe benefits to the Steamfitting Industry Fund of New York and Long Island for each and every hour worked by journeymen and apprentice steamfitters for work performed by them in the City of New York and in Nassau and Suffolk Counties, NY. Such Fund was originated by an agreement dated July 6, 1966, to which the Contractors' Association and Enterprise Association were parties. Such Fund was established by a Declaration of Trust, dated September 30, 1966, and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all provisions of said Agreement and Declaration of Trust.

Rule XXIII-A.
LABOR-MANAGEMENT COOPERATION COMMITTEE

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay into the Labor-Management Cooperation Committee, which was established by an Agreement and Declaration of Trust dated July 1, 2008 as a trusteed fund jointly administered in compliance with law the sum of four cents ($0.04) per hour worked as set forth in Rule I for work performed by each journeyman. Said sums less actual expenses of administering the trust shall be held by the Trustees of said Committee for the benefit of the industry.

Such Fund was established by an Agreement and Declaration of Trust, dated July 1, 2008, to which the Contractors' Association and Enterprise Association were parties and all employers agree to make the aforesaid payments in accordance with the rules and regulations established by the Trustees of said Trust, from time to time, and to be bound by and comply with all of the provisions of said Agreement and Declaration of Trust as the same exists or may during the term of this Agreement be amended in accordance with its terms.

Rule XXIII-B.
UNITED ASSOCIATION TRAINING FUND

From July 1, 2021 to June 30, 2023 inclusive, all employers shall pay into the United Association Training Fund the sum of ten cents ($0.10) per hour worked as set forth in Rule I for work performed by each steamfitter.

Rule XXIV.
BONDING AND FUND PAYMENT REQUIREMENTS AND ADMINISTRATION

The below bonding and fund payment requirements and administration procedures shall be effective January 1, 2022. For requirements in effect through December 31, 2021, please refer to the prior Local 638 Steamfitters Collective Bargaining Agreement.

Section I. Each Employer shall furnish a bond or an equivalent amount in cash to the joint benefit of the Trustees of the Steamfitters' Industry Welfare Fund, the Steamfitters' Industry Pension Fund, the Steamfitters Supplemental Retirement Plan, the Steamfitters' Industry Educational Fund, the Steamfitters' Industry Vacation Plan, the Steamfitters' Industry Security Benefit Fund, and the Steamfitting Industry Fund of New York and Long Island, including the guarantee to the Steamfitters' Industry Fund of wages paid by check (the "Funds"), guaranteeing payment to said Trustees, jointly and severally, of any and all amounts due from said Employer to each or all of the Funds, pursuant to the terms of this Agreement.

Such bond shall be in form and substance, and shall be issued by a surety, satisfactory to the said Trustees, jointly. Such bonds shall provide that the counties of New York and Nassau and Suffolk are proper venue.

The aggregate amount of the base bond shall be determined by the following:

0 to 6	Local 638 Employees	$60,000.00
7 to 14	Local 638 Employees	120,000.00
15 to 30	Local 638 Employees	170,000.00
31 to 60	Local 638 Employees	450,000.00
Over 61	Local 638 Employees	750,000.00

Section II. Each Employer will make the required Fund payments provided for in this Agreement within fourteen (14) calendar days following the close of the work week, i.e., for a work week ending on Tuesday, the Fund payments must be received by the Fund Office no later than the second following Tuesday except where Trustees have, in writing, authorized or directed other terms; with respect to any payments not made within the required time, an Employer will pay interest at 16 percent (16%), or the maximum rate, if any, fixed by Section 5-501 of the New York General Obligations Law (hereinafter "the Maximum Rate of Interest") from the date due, and, as liquidated damages, an additional amount equal to 20% of the unpaid contributions as determined by a court of competent jurisdiction, and will reimburse the Funds for the reasonable expense of collection including attorneys' fees and audit fees. In the event that an Employer is delinquent fourteen days after written notice of delinquency addressed to the Employer has been deposited in the U.S. mail by certified mail, return receipt requested, the said Employer shall be required thereafter for the remaining term of this Agreement to furnish a bond for double the amount required in Section I, and if the said Employer is thereafter delinquent at any time during the term of this Agreement of twenty-eight days after written notice of delinquency addressed to the said Employer has been deposited in the U.S. mail by certified mail, return receipt requested, the said Employer shall be required thereafter for the remaining term of this Agreement to furnish a bond for quadruple the amount required in Section I. In the case of delinquency, the maximum bond shall be quadruple the base bond amount required. The Trustees may, in their sole discretion, accept or require a personal bond, certified check, or guarantee of payment of one or more stockholders or officers of the Employer in lieu of the additional amounts which may be required of an Employer pursuant to this paragraph.

Application for such less frequent payments must be made in writing by the Employer and shall, upon approval, require a bond for double the amount required in Section I but in no case shall the base bond be more than $750,000.00. Such less frequent payments are described as monthly. Payment must be made within fifteen (15) calendar days following the close of the prior work month. If said employer has not remitted payment of funds for the prior month by the 15th of the following month, he shall be considered delinquent.

The Trustees, acting through Chairman and Co-Chairman or a sub-committee of Trustees designated by them, or the Administrator, have the authority to direct, in writing, an Employer that is unbonded and/or on the delinquency list more than three (3) times during the term of this Agreement to make its payments to the Funds within three (3) calendar days from the close of the work week, i.e., for a work week ending on Tuesday, the Fund payments must be received by the Fund Office no later than the Friday of the same calendar week. The

Trustees, as to any Employer so required to make Fund payments within three (3) days, may initiate arbitration and/or any other remedy available to them, at any time after the third calendar day from the close of the work week, without further notice. In addition, where a contractor is unbonded and/or on the delinquency list more than three (3) times during the term of this Agreement and/or issues a check to the Funds which is returned "unpaid for insufficient funds," "uncleared funds" or as to which the Employer stopped payment, the Trustees, through Chairman and Co-Chairman or a sub-committee of Trustees designated by them, have the authority to direct an Employer to make Fund payments by means of Certified Check, Bank Check, or Money Order. Any Employer that fails to meet a three (3) day payment schedule that may be directed pursuant to this Paragraph, and/or fails to pay by Certified Check, Bank Check or Money Order when so directed, shall be deemed delinquent within the meaning of Rule IV, Section II, and the Union may refuse to permit employees to work for such Employer.

Reporting of Fund payments by employee's name shall be submitted at the same time as payments are due.

In addition to any other action the Funds may be empowered to take, the Funds may bring an action pursuant to Sections 502 (G) (2) and 515 of the Employee Retirement Income Security Act of 1974, as amended, to enforce the Employer's obligation to make contributions. In any action under the preceding sentence in which judgment is awarded in favor of the Funds, such judgment shall award the Funds: the unpaid contributions, and interest at the Maximum Rate of Interest, and as liquidated damages an amount equal to 20 percent of the said unpaid contributions as determined by the court, and reasonable attorney's fees, audit fees and costs of the action, and such other legal or equitable relief as the court deems appropriate. Nothing in the foregoing two sentences shall be construed as a waiver or limitation on the Funds' or the Trustees rights to enforce an Employer's obligation to contribute in any other type of proceeding against the Employer and/or its shareholders and/or its officers.

In the event an Employer is delinquent hereunder as defined in Rule IV, Section II, the Funds, in their sole discretion, may initiate arbitration proceedings to obtain appropriate relief. The parties specifically agree that any claim made by the Funds based upon any such delinquency may be initiated by the Funds upon fourteen (14) days written notice of intention to arbitrate by registered mail or certified mail to the last address of the employer on record with the Fund Office, and to Roger Maher, as Arbitrator, or such other Arbitrator as the Board of Arbitration may from time to time select, to be settled by arbitration in accordance with the Voluntary Labor Arbitration Rules of the American Arbitration Association, except as otherwise provided herein and judgment upon the award rendered by the Arbitrator may be entered in any court having jurisdiction thereof and shall be final and binding upon the parties. Should the Employer fail to appear, together with his payroll records for the period of delinquency in question, the Arbitrator may find against the Employer by default. In any case in which the Arbitrator finds that the employer is indebted to the Funds, the award shall include: the unpaid contributions, and interest on unpaid or tardily paid contributions at the Maximum Rate of Interest; and as liquidated damages an amount equal to 20% (twenty percent) of the unpaid contributions as well as any sums due pursuant to Section IV of this Rule; and reasonable attorney's fees, audit fees and costs of collection, and such other legal and equitable relief as the Arbitrator deems appropriate. It is specifically agreed by the Employer that in any case in which the Funds serve a notice of intention to arbitrate (or demand for arbitration) which results in a notice of hearing being issued by the Arbitrator, contributions for all weeks which are claimed as due by the Funds as of the notice of intention to arbitrate as well as contributions for all weeks claimed as due by the Funds through the date of the arbitration hearing or adjourned date, if any shall be subject to such arbitration. Once the notice of the hearing is issued, payment of the sums claimed in the notice of intention to arbitrate and all sums claimed as becoming due thereafter in accordance with the preceding sentence, will not be deemed to have been made until the Fund Office receives such sums in the form of cash, certified check, or an uncertified check which the Fund Office determines has cleared prior to the arbitration hearing; the Fund's judgment as to the time of clearing of a check shall be conclusive. An Employer to whom a demand for arbitration has been mailed shall pay cancellation fee for legal, administrative and/or arbitration costs as follows: if all fringe benefits claimed in the demand for arbitration are paid, with interest, prior to the arbitrator mailing a notice of hearing, the cancellation fee is TWO HUNDRED DOLLARS ($200); if the notice of hearing has been issued by the arbitrator, and all fringe benefits claimed by the Funds as due as of the date of hearing have been paid, with interest, the cancellation fee is FOUR HUNDRED DOLLARS ($400), if paid more than twenty-four (24) hours prior to the scheduled starting time of the hearing and SIX HUNDRED DOLLARS ($600) if paid prior to, but less than twenty-four (24) hours before the scheduled starting time of the hearing. Initiation of the aforesaid arbitration procedure shall not preclude the Funds from pursuing any other remedy or remedies available to them including other remedies against the Employer and/or its officers and/or its shareholders. It is expressly understood and agreed that the arbitration provision herein shall not be an exclusive remedy.

At the option of the Funds, suit may be brought by the Funds against the Employer (a) in the Southern District or Eastern District of New York in the case of Federal court action by the Funds, or (b) in the courts of the State of New York, in which event the Counties of New York or Nassau are deemed proper venue, and the law of the State of New York shall apply except that federal law shall apply as to the remedies available through arbitration. It is agreed that the Funds may sue collectively or individually in their own name or, alternately, in the name of the Administrator and at least one Employer Trustee and one Union Trustee from each of the Funds.

The Funds, in their own name or, alternatively, in the name of the Administrator and at least one Employer Trustee and one Union Trustee from each of the Funds, may file mechanic's liens on behalf of each and every employee who works under this Agreement, with respect to any contribution due such employee and not paid in accordance herewith.

Section III. Each Employer who chooses to exercise the option of paying wages by check, as provided in Rule IV of this Agreement, shall, after receiving the required approval of the New York State Labor Commissioner, file a copy of such approval with a written request for permission to pay by check with the Board of Arbitration with the consent by the Employer Association, the Board of Arbitration will, alone, make such determination. The Board of Arbitration shall withhold approval from any Employer who has been delinquent in any wage or Fund payments during the preceding twelve months. The Board of Arbitration will recommend to the Steamfitters' Industry Fund Trustees, the name of such qualified Employer and after written approval by the Steamfitters' Industry Fund Trustees, the Employer may commence paying by check.

An Employer whose check for wages fails to clear in due course agrees forthwith to pay to the Steamfitting Industry Fund of New York and Long Island Trustees the face amount of such check together with interest at the Maximum Rate of Interest per annum from the date said Trustees paid such sum on behalf of the Employer together with the reasonable expense of collection.

Section IV. The Trustees may at any time direct a payroll audit of any Employer to verify the Fund payments. Failure by any Employer to permit such audit within a reasonable time from receipt of written demand by the Fund Office, mailed to the Employer by registered mail, return receipt requested, to conduct such audit, or to submit the reports of payments due to the Fund Office in accordance with the requirements of this Rule XXIV, shall constitute a breach of this Agreement and the rules attached for which Employer shall be liable to the Funds for liquidated damages in the sum of $500 per day for each day of delay in permitting such audit beyond the said 10 days, or in submitting the said reports in accordance with the Rule XXIV.

The Trustees shall notify the appropriate Enterprise Association officials of all delinquent Employers, including Employers who are not in compliance with the bonding, auditing and reporting requirements hereof, for action as provided for in Rule IV. All bonds furnished under this Rule shall provide for the bonding of the Employer's obligation to pay the Maximum Rate of Interest per annum of any delinquent Fund payments or wages and for the reasonable expense for collection including liquidated damages, audit fees and attorney fees in addition to the principal amount.

Rule XXV
Health & Safety Committee

By the Parties agreeing to this section, they expressly waive the provisions of the New York Health and Essential Rights Act (commonly referred to as the "Hero Act"). The Union and MCA shall meet as needed to discuss health and safety topics relevant to the industry, and where necessary, shall disseminate information and best practices to the industry.

AGREEMENT

ARTICLE I
FURNISHING ALL STEAMFITTERS REQUIRED

On this 1st day of July, 2021 it is hereby agreed between the Mechanical Contractors Association of New

York, Inc., hereinafter referred to as "Contractors' Association" and the Enterprise Association of Steam, Hot Water, Hydraulic, Sprinkler, Pneumatic Tube, Ice Machine and General Pipe Fitters of New York and Vicinity, Local Union No. 638, of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, hereinafter referred to as "Enterprise Association", that the Enterprise Association shall enforce all the foregoing Rules and shall furnish to the members of the Contractors' Association all the competent steamfitters and apprentices which they demand through the Contractors' Association and that in consideration thereof the members of the Contractors' Association will, in the employment of steamfitters and apprentices, observe the Rules of the Enterprise Association within the territory to which they apply as set forth in the copy of same hereto attached. No other Rules shall apply during the life of this Agreement.

ARTICLE II
LIST OF MEMBERS

It is further mutually agreed that the Contractors' Association within sixty (60) days after the signing of this Agreement will furnish the Enterprise Association a list of its members and will notify the Enterprise Association of any changes that take place in said list of members every month. A correct list of members of the Enterprise Association shall be furnished to the Contractors' Association within sixty (60) days after the signing of this agreement and the Enterprise Association shall each month notify the Contractors' Association of changes that take place in said list of members.

ARTICLE III
STRIKES AND LOCKOUTS

It is further mutually agreed that no strike against any member or members of the Contractors' Association shall be ordered by any officer of Enterprise Association or entered into by any member of the Enterprise Association nor shall any lockout against members of the Enterprise Association be declared by the Contractors' Association, so long as this Agreement and the rules hereto attached are conformed to by both parties.

ARTICLE IV
BOARD OF ARBITRATION

It is further mutually agreed that a Permanent Board of Arbitration shall be established; the said Board to consist of ten (10) members, five (5) members of the Contractors' Association and five (5) members of Enterprise Association.

ARTICLE V
INELIGIBLE MEMBERS

It is further mutually agreed that no member of the Board of Arbitration shall sit on any matter in which such member is an interested party.

ARTICLE VI
DUTIES OF BOARD OF ARBITRATION

Section I. It is further mutually agreed that the question, matters and complaints, which shall be presented to the Board of Arbitration for decision, shall be as follows:

All alleged violations of this Agreement or the Rules attached.

The determination of the true intent and meaning of any part of this Agreement or the Rules.

The making of a new agreement to supersede this Agreement at its termination.

Any other matter which may, by mutual agreement, be referred to the Board.

The Board of Arbitration shall meet monthly (unless mutually agreed unnecessary) to consider the probable number of steamfitters which shall be required in the near future to carry on the work of the members of the Contractors' Association.

Section II. The Board of Arbitration shall meet within two (2) weeks after the execution of this Agreement and shall select a permanent Arbitrator, who shall serve for one year. The Board shall select a new Arbitrator or renew the term of the Arbitrator for subsequent one year terms. All new appointments or reappointments shall be

made no more than 60 days nor less than 30 days prior to the end of the term. Should the appointed Arbitrator be unable or fail to act, the Board, by vote may vacate the appointment and shall make a new appointment within two (2) weeks.

If the Board of Arbitration fails to agree on any appointment within the time stated herein, they may, by agreement, extend the time for such appointment. However, if such time extension is not agreed to, each Association shall select an Umpire and the two (2) Umpires shall within two (2) weeks select the Permanent Arbitrator.

ARTICLE VII
PROCEDURE OF BOARD OF ARBITRATION

Section I. It is further mutually agreed that in case any of the Rules or Agreements are violated by either of the parties to this Agreement, or by any of its members, then no strike, work stoppage or lockout against any member or members of either of the associations shall be instituted by either association without first submitting the grievance or question at issue to the Board of Arbitration.

Prior to the alleged violation being filed by either party the following procedure will be adhered to: the charging party will notify in writing the Secretary of their respective association of the alleged violation within ten (10) working days of the alleged occurrence of a violation. A meeting will be scheduled between both associations within thirty (30) days, unless otherwise mutually agreed. Attending this meeting will be both interested parties and a subcommittee consisting of two (2) Trade Board representatives from each association. If the dispute cannot be resolved, it will then be formally submitted to the full Board of Arbitration for discussion.

The first meeting of the Board of Arbitration shall take place within fifteen (15) working days after notification in writing from the Secretary of the Association having a grievance, unless otherwise mutually agreed. When a decision is reached by the Board of Arbitration upon any matter submitted to it, the said decision shall be final and binding on both parties. Any subsequent action of either Association shall in no way alter or nullify the effect of said decision, nor shall said decision be abrogated by either Association without the consent of the Board of Arbitration.

If the Employer fails to attend the sub-committee meeting described in Section I, second paragraph, or if it fails to attend a meeting of the full Board of Arbitration referred to in Section I, third paragraph, the sub-committee or the full-committee, as the case may be, may issue a decision by default. If the subcommittee declines to issue a written decision in an instance when the employer fails to appear, the full committee shall then meet. If the employer fails to appear at the full committee meeting and the committee fails to render a decision, the union may seek appointment of an arbitrator.

Each Association shall have one (1) vote.

The Rules and Regulations of the Joint Arbitration Board for the Conduct of Grievances Pursuant to Article VII shall prevail and a copy of said rules shall be provided upon request.

Section II. Should the Board of Arbitration fail to agree after three (3) consecutive meetings, except as to interpretation of the Agreement of March 24, 1914, hereto attached, said Board of Arbitration shall within two (2) days refer the dispute to the Arbitrator, and each side shall make its argument before the Arbitrator, who shall within two (2) working days thereafter render his decision, and said decision shall be final and binding upon both parties hereto.

ARTICLE VIII
JOINT ARBITRATION PLAN

It is further mutually agreed that both parties to this Agreement shall abide by a Joint Arbitration Plan that may be agreed upon by representatives of the several employers' associations and a majority of the unions of the building trades of New York City.

It is mutually agreed between the parties hereto that in event of disputes between trades, and disputes relative to question of jurisdiction of trade, the parties will abide by previous decisions as to jurisdiction published in the latest issue of the B.T.E.A. Handbook, commonly known as "The Green Book."

It is mutually agreed between the parties hereto that disputes between trades, and disputes relative to

jurisdiction of trade not covered by decision in the latest issue of the B.T.E.A. Handbook, commonly known as "The Green Book", shall be adjusted in accordance with the principles of the New York Plan for the Settlement of Jurisdictional Disputes as set forth in the Joint Arbitration Plan of the New York Building Trades as adopted on July 9, 1903, and amended on April 22, 1905, and as thereafter amended, except to the extent that Section 3 of the said Joint Arbitration Plan requires the employer to employ only members of the union directly or indirectly through subcontractors or otherwise.

Pending determination of any dispute under the New York Plan for the Settlement of Jurisdictional Disputes as stated in the preceding paragraph the members of the Union shall remain at work on the project without change in status.

ARTICLE IX
TERM OF THIS AGREEMENT

It is further mutually agreed that no change in this Agreement shall be asked for by either party hereto, to take effect prior to the first day of July 2023 and not then unless notice by the Association asking for such change is given to the other Association on or before the 31st day of January next preceding the first day of July 2023. Such notice shall be given in writing by Secretary of one Association to Secretary of the other Association, and shall state specifically all changes desired, and written receipt therefore shall be evidence of such notice.

In case no notice is served by either Association on or before January 31, 2023 then this Agreement shall continue in effect from year to year with right reserved for either party to serve notice on or before any 31st day of January in any year for any desired change to take effect on the following first day of July.

ARTICLE X

It is understood and agreed that this Agreement is based upon the Principles for Trade Agreements as set forth in the printed annex to this Agreement, and nothing in the Rules of the Enterprise Association attached hereto, or within this Agreement, shall be interpreted to contradict or nullify any of the said Principles.

It is agreed that if Enterprise Association furnishes Steamfitters to anyone upon more favorable terms or conditions than those contained herein, then this Agreement shall automatically be amended to incorporate such more favorable terms or conditions.

It is understood and agreed that in case any provisions of this Agreement shall be found to be contrary to law, such finding shall not in any way affect the other provisions of this Agreement, which shall, notwithstanding, continue in full force and effect, and the parties shall within ten (10) days after receipt of written notice by one party from the other, negotiate in an attempt to arrive at an appropriate substitute provision in light of such ruling.

In the event of change of applicable Federal laws affecting this Agreement, by virtue of which change it shall become legal for the Enterprise Association to demand that only members of Enterprise Association be employed in the performance of work under its jurisdiction, or to institute what is commonly known as the "closed shop", the Contractors' Association agrees that in such event and on the giving of ten (10) days’ notice to the Contractors' Association by Enterprise Association in writing by registered mail, this Agreement shall be deemed amended to the end that on and after the conclusion of the said ten (10) day period only members of the Enterprise Association shall be employed by the Contractors' Association in their performance of work coming within the jurisdiction of Enterprise Association and only members of the Metal Trades Branch of Local Union 638 shall be employed in the performance of service work more particularly described in Rule XVI of this Agreement.

For the Enterprise Association of Steam, Hot Water, Hydraulic, Sprinkler, Pneumatic Tube, Ice Machine, and General Pipe Fitters of New York and Vicinity, Local Union 638 of the United States and Canada

Local 638 Trade Board

Patrick Dolan

John Gruter

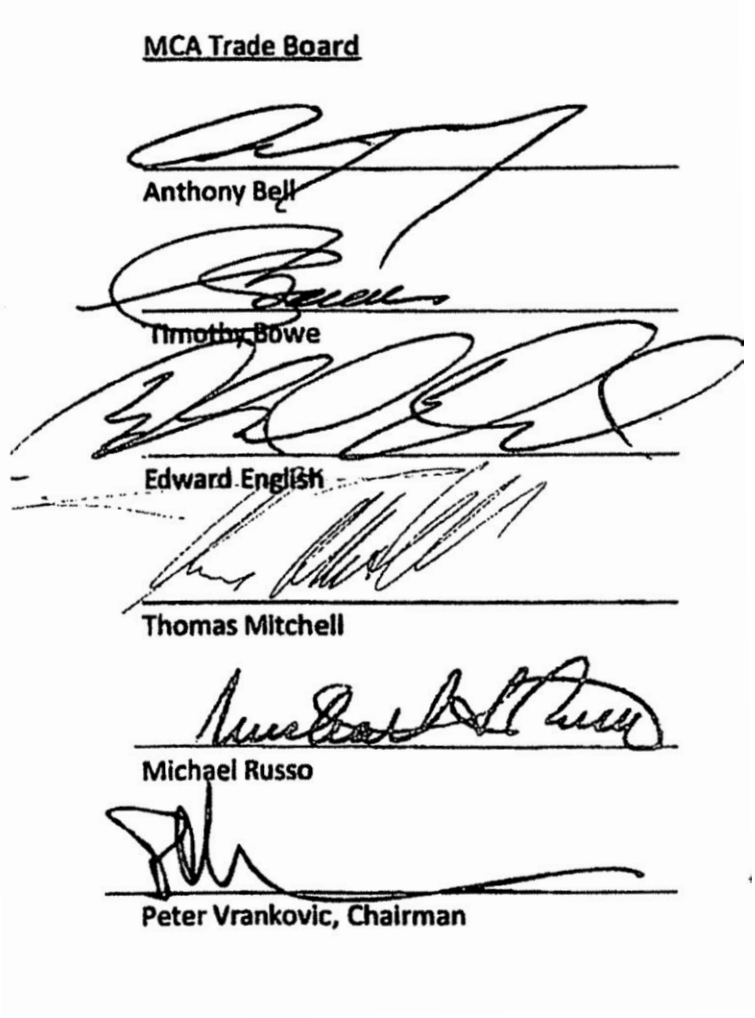
Brian Hart

Daniel Mulligan

Michael Mulvaney, Chairman

Joseph Welsh

For the Mechanical Contractors Association of New York, Inc.



**UNITED ASSOCIATION OF PLUMBERS
AND STEAMFITTERS OF
UNITED STATES AND CANADA**

To Whom It May Concern:

On March 24th, 1914, agreement was made between the United Association of Plumbers, Steam Fitters and Steam Fitters' Helpers of the United States and Canada and the Enterprise Association of Steam, Hot Water, Hydraulic, Sprinkler, Pneumatic Tube, Ice Machine and General Pipe Fitters of New York and Vicinity, and the Progress Association of Steam, Hot Water and General Pipe Fitters' Helpers of New York and Vicinity, which resulted in the admission of the above-mentioned Enterprise and Progress Associations into the aforesaid United Association of Plumbers, Steam Fitters and Steam Fitters' Helpers of the United States and Canada, which agreement entitles the aforesaid Enterprise and Progress Associations to all constitutional rights and privileges of the United Association.

This agreement provides and is so understood that the Enterprise Association, known additionally as Local Union No. 638 of the United Association, shall have jurisdiction over all steamfitters in the City of New York, and that the Progress Association, known additionally as Local Union No. 639 of the United Association, shall have jurisdiction over all steamfitters' helpers in the City of New York and such other territory as may be hereinafter referred to.

It is understood, and contained in the terms of the agreement referred to, that the Enterprise Association and the Progress Association shall have territorial jurisdiction over such territory as is contained in the City of New York, all of Long Island and such other adjacent territory as may hereafter be agreed upon between the said Enterprise and Progress Associations and other Local Unions of the United Associations in the vicinity of New York City.

It is further understood and agreed that the said Enterprise and Progress Associations shall continue to observe all terms and conditions of agreements now existing between said Enterprise and Progress Associations and any employer or employers' association, without objection or interference on the part of the United Association of Plumbers, Steam Fitters and Steam Fitters' Helpers of the United States and Canada, or of any Local Union or Local Unions thereof.

It is understood and agreed that the members of the Enterprise and Progress Associations while working for employers located in the City of New York, shall, without hindrance, be privileged to work at the Steam Fitting trade in the counties of Hudson, Essex, Union, Bergen and Morris, in the State of New Jersey, and at the trades of Steam Fitting and Sprinkler Fitting in the County of Westchester, State of New York, without depositing clearance cards in the usual manner.

Members of regularly constituted United Association Locals, while working for employers located in the aforesaid New Jersey territory, and the county of Westchester, State of New York, shall have a reciprocal privilege as to the City of New York, provided such members receive a scale of wage prevailing in the City of New York.

The following plan of trade jurisdiction as indicating the work of a steamfitter and a steamfitters' helper is hereby accepted by the United Association through its general board of officers, and by the Enterprise Association and Progress Association.

DUTIES OF A STEAMFITTER

(1) Wherever any apparatus, utensil or appurtenance erected or installed by the steamfitter shall require a connection from the water supply of the building, or from any piping erected by the plumber, such supply or waste connection shall be made by the steamfitter. The plumber shall leave in the water supply piping and in the waste or sewer piping, suitable outlets, at practical and convenient points, and the steamfitter shall run all necessary piping from such outlets to the apparatus erected or installed by him and from such apparatus to such outlets.

Piping of every description, together with its accompanying fittings, valves and appurtenances (excepting, only, air piping for thermostatic valves) which joins together the several parts of apparatus erected or installed by the steamfitter, in accordance with the jurisdiction of a steamfitter as herein described, including by-passes, shall

be erected, installed and connected by the steamfitter, and this regardless of whether such piping conveys steam, water air-brine ammonia, oil or other liquids or any commercial product or any product in course of manufacture.

(2) All steam, pneumatic and hydraulic poser piping other than the piping for thermostatic valves.

(3) All steam and hot-water heating apparatus and all steam boilers connected to hot-water heating apparatus and all steam boilers connected to hot-water tanks.

(4) All heat regulating systems, excepting piping for thermostatic valves.

(5) All vacuum heating systems are the work of the steamfitter. All vacuum cleaning systems are the work of the plumber, provided, however, that same does not include any form of piping for cleaning electrical and other apparatus and machinery as provided for in paragraph No. 10.

(6) All pneumatic tube systems.

(7) All ice-making, refrigerating and cooling apparatus of every description. This does not include piping for transmitting ice water for drinking purposes.

(8) All hydraulic piping for elevator, and for the operation of curtains, presses and machinery.

(9) All oil piping in connection with power or heating apparatus, provided, however, that piping used for the transmission of liquid gasoline in garages, dye houses and cleaning establishments shall be the work of the plumber.

(10) All air piping for power work, cleaning of electrical and other apparatus and machinery.

(11) Placing, erecting and testing of all fan coils, humidifiers and air washers in connection with heating and ventilating apparatus and connecting together the parts thereof.

(12) Setting of all fixtures, pumps, tanks and heaters in connection with steam power apparatus or with steam or hot water heating apparatus.

(13) All steam connections for hot water tanks shall be the work of the steamfitter. The employees of the contractor furnishing the tank shall place it with all necessary hangers or supports and the plumber shall make all water connections to the tank.

Hot water tanks and heaters for domestic purposes, which have no steam connections, shall be installed by the plumber.

(14) All air piping for window or door opening devices or for switch or signal system or for like purposes.

(15) Building and repairing of water grates for power or heating.

(16) All sprinkler systems including all fire stand-pipes connected thereto shall be installed, complete, by the steamfitter, excepting, only, that the plumber shall set the meter and do all piping from the meter to the water supply main in the street.

(17) All fire stand-pipes not connected with the sprinkler system, nor with the water supply of the sprinkler system, shall be the work of the plumber.

(18) All steam and return connections of all kitchen utensils.

(19) All steam ejectors and all piping in connection therewith.

(20) All piping for the transmission of glucose, syrup, liquid sugar, ink or other liquids in manufacturing or commercial plants or for the transmissions of such other commodities as pass through piping from one point to another in manufacturing or commercial plants, when such liquids or commodities are part of the product of such plants, and all piping utilized for railings and racks and similar piping shall be the work of either the steamfitter or the plumber, provided, however, that pipe railings in engine rooms and boiler rooms shall be the work of the steamfitter.

In all matters as to which decisions have, heretofore, been rendered by the Arbitration Board of the New York Building Trades, such decisions shall govern the jurisdiction of the plumber and steamfitter.

Representing the United Association of Plumbers and Steamfitters of the United States and Canada:

JOHN R. ALPINE,

General President

THOMAS E. BURKE,
General Secretary-Treasurer

E.W. LEONARD,
General Organizer

THE PRINCIPLES FOR TRADE AGREEMENTS

As referred to in Article X of the agreement dated July 1, 2021 between the Mechanical Contractors Association of New York, Inc., and the Enterprise Association of Steam, Hot Water, Hydraulic, Sprinkler, Pneumatic Tube, Ice Machine and General Pipefitters of New York City and Vicinity, Local Union No. 638 of United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada.

PRINCIPLES UPON WHICH TRADE AGREEMENTS SHOULD BE BASED

1. There shall be no strikes or lockouts or stoppage of work, neither shall members of a union collectively leave the work of a member of the Building Trades Employers' Association. Trade agreements made by the Employers' Associations, members of the Building Trades Employers' Association, and trade unions shall provide that all disputes arising in the trade shall be settled by trade boards of arbitration, with an umpire if necessary, and the decisions of trade boards and umpires shall be final and binding.

2. There shall be no agreement providing for discrimination against building materials, raw or manufactured.

3. The amount of work a man may perform shall not be restricted by a union nor by the representative, officers or members of a union; and the use of machinery, tools, appliances or methods shall not be restricted or interfered with.

4. The employer shall be at liberty to employ and discharge whomsoever he sees fit; and the members of the unions shall be at liberty to work for whomsoever they shall see fit.

5. The foreman shall be the agent of the employer and shall not be tried for any of his acts as foreman without due notice of the trial, accompanied by a written statement of the charges against him, being given to the Joint Trade Board.

6. The trade associations and unions shall jointly maintain a system which will provide an adequate force of skilled mechanics. The Apprenticeship Plan of the New York Building Congress is endorsed.

7. Overtime shall not be worked, except when unavoidable.

8. There shall be no provision, in any trade agreement, having for its object the collection of debts.

9. There shall be no provisions, in any trade agreement, which will prevent the doing of cutting by the trade which installs the work for which the cutting is done.

10. Unskilled work, as defined in the trade agreements, may be performed by the laborers or helpers. The work that has been heretofore recognized to be in the possession of a trade shall not be submitted to arbitration, unless possession is claimed by a party or parties to a jurisdiction of trade dispute.

11. All contractors party to this agreement, agree to be bound by decisions of the United Association, the B.T.E.A. of New York City or the National Joint Board.

12. The Employers recognize that the Union had a legitimate goal of preserving bargaining unit work opportunities for the Steamfitters who are or have been regularly employed under the Trade Agreement.

The Employers also recognize that the above goal can sometimes best be achieved through the flexibility of modifying work rules (other than those pertaining to wages, benefit fund contribution rates, or apprentice ratios) for a particular project.

Therefore, if modifications are approved by the Joint Trade Board to preserve bargaining unit work, the Employers agree that they will not invoke the Most Favored Nations Clause, Article X, second paragraph, based

on the Trade Board's modification of Work Rules (other than those pertaining to wages, benefit fund contribution rates, or apprentice ratios) for a particular job project.

NEW SUPPLEMENT FOR LONG ISLAND AND RESIDENTIAL WORK IN NEW YORK CITY

For jobs bid on or after July 1, 2021, the terms of the Public Works Supplement will be used:

1. for all jobs on Long Island, NY except power generation jobs,

2. for residential jobs in Brooklyn, Queens, the Bronx, and Staten Island, NY,

3. for residential jobs in Manhattan.

For purposes of this provision "residential job" means all new construction or renovation of residential buildings, and a residential job is defined as single-family units contained in a multi-story building or a budget/economy hotel such as Hilton Garden Inn, Hampton Inn, Holiday Inn Express, Marriott Courtyard (or any others as agreed to by the Joint Trade Board); residential building does not include nursing homes, assisted living facilities, hospitals, college dormitories, or hotels (other than budget/economy hotels).

A residential building may include up to two floors of offices, stores, and/or restaurants; this Supplement shall not apply to those floors, unless included in the base building contract.

The most favored nation's provision of the Trade Agreement, Article X, second paragraph, will not apply to or be invoked as to this Supplement.

This Supplement shall not apply to, or be invoked as to any job bid prior to July 1, 2021, and this Supplement shall not apply to any job governed by a Project Labor Agreement bid prior to July 1, 2021.

All work bid under the terms and conditions of this Agreement, shall be completed under the terms of this Agreement.

Temporary services will be maintained at the owner's request in accordance with the Trade Agreement. Once the system is on automatic, then no temporary services will be required.

The Supplement shall expire June 30, 2022 as to item (3) residential jobs in Manhattan.

PUBLIC WORKS SUPPLEMENT

SCOPE

This Public Works Supplement is limited to public works projects (Federal, State, City) to be performed under prevailing rate laws (Davis-Bacon Act and/or Labor Law Section 220), and is applicable to HVAC and mechanical public works contracts with a dollar value not to exceed Thirty Million dollars ($30,000,000) and to fire protection/sprinkler public works contracts with a dollar value not to exceed Three Million dollars ($3,000,000).

TERM

The Supplement is for a period commencing July 1, 2021 to June 30, 2022; the Supplement is to be evaluated by the Joint Trade Board and can be extended for one (1) year periods only if agreed to by the Joint Trade Board (there shall be no arbitration to resolve any lack of agreement). If a job is bid under the Supplement then the terms of the Supplement remain in effect for that job until its completion.

RULE I

Section I: Hours of labor shall be 7 or 8 hours per day, at the contractor's discretion, to be performed between 6:00 six o'clock A.M. to 4:30 four thirty P.M.

Section VI: Parties agree to a shift plan for all work performed and the steamfitters and/or apprentices shall be paid the wage rate for regular time plus a fifteen percent (15%) premium on both wages and fringe benefit

contributions.

RULE III
RATE FOR OVERTIME AND HOLIDAYS

Section I. On transit projects, where work is performed in the vicinity of tracks all shift work on weekends and holidays may be performed at regular shift rates.

RULE V

Section I: All work to be performed under this agreement within the jurisdiction of the Enterprise Association must be performed by Journeymen Steamfitters, Apprentices or Trainees.

The crew size shall be any number of men required to safely perform the work, and shall be increased or decreased at the discretion of the employer.

Hiring of Steamfitters shall be in even numbers. An even number of Steamfitters shall be employed on the job at all times. At no time will the amount of Apprentices and/or Trainees exceed the number of Journeymen on the job. (The work of all Apprentices and Trainees will be supervised by a Steamfitter Journeyman).

Section II: It is the employer's discretion to designate a foreman who must be a Journeyman Steamfitter. A foreman so designated shall be allowed to work with tools.

RULE IX
CUTTING UP AND MAKING FITTINGS

Section I: All pipe may be cut, threaded, grooved and have fittings made up by hand or machine on the job or in the shop of the direct employer at the option of direct employer. If the said shop is a permanent shop, equipped with permanently installed pipe cutting and threading machinery, then the work shall be done by a Steamfitter working alone. When a direct employer has no permanently installed pipe cutting machinery in his shop, such work shall be done in accordance with Rule V on the job, or in any shop employing 638 Steamfitters.

Section II: All sprinkler and combination sprinkler/standpipe systems inclusive of cross mains, stringers and fire hose stations connecting pipe to same may be cut, threaded or grooved in a shop or on the job at the option of direct employer.

All fittings above 2" on sprinkler work may be made up in the shop of the direct employer by a Steamfitter working alone or on the job at the option of the employer. The makeup of fittings up to and including 2" in diameter can be ordered from any shop. Prefabricated flexible sprinkler heads not to exceed twenty-four (24) inches are permissible.

All types of chemical fire protection systems is the work to be performed by Journeymen Steamfitters and/or Apprentices.

Section III: All Pipe Fabrication performed in a shop under Section I and II must be labeled before leaving the shop. The Journeyman performing the work must attach labels to the pipe showing the Journeyman's name, signature, book number, name and address of the shop and date when work was performed to demonstrate that such work was done by a Journeyman Steamfitter within this bargaining unit and under the terms of this Agreement. Reproductions of the Journeyman's signature will not be acceptable.

Public works labels shall be obtained by written application to Local Union 638 from individual employers. These labels shall be delivered by the Union to the Steamfitter in charge of each shop, and he shall be fully responsible for the proper distribution of these labels.

Section IV: Radiator branches, convector branches and coil connections shall be cut, threaded, welded, brazed, glued, soldered or any other method of joining shall be done on the job by hand or machine in accordance with Rule V or at the option of the contractor in a shop employing 638 steamfitters.

Section VI: Pipe of all diameters can be ordered from a supply house cut into pieces for ease of access or handling and delivered to the shop of the direct employer or the job site. Half lengths of pipe ordered from a supply house may have a mill bevel, thread or groove on each end. Pipe up to and including 12" diameter may be ordered cut to length with both ends prepared from any supply house. This rule does not apply to combination standpipe.

Section VII: All pipe used for temporary services which has been cut in the shop or on the job and subsequently removed may be used again.

RULE X
WELDING

Section V: Pipe up to and including 12" in diameter may be ordered cut to length with both ends prepared from any supply house. This rule does not apply to combination standpipe.

RULE XI

Section VII: When Steamfitters are working in the building no temporary service personnel are required.

Section VIII: Temporary air conditioning services will only be required for central chiller plant operation.

Section XIII: When temporary services are required the number of Steamfitters required shall be determined by the employer and the Union for the safe operation of the system.

RULE XV
SHIFT WORK

Section I: Shift work may be performed at the option of the employer outside of the regular work day except Saturday, Sunday, and Holidays, in accordance with the following:

a) A shift shall consist of eight (8) working hours. All work performed in excess of eight (8) hours shall be paid at double the rate for regular time. No shift shall commence after 7:00 p.m. on Friday or 7:00 p.m. the day before holidays. All work performed after 12:01 Saturday or 12:01 the day before a Holiday will be paid at double the rate for regular time.

b) Starting time for each shift shall be designated by the employer.

c) A Steamfitter or Apprentice who has worked during the same regular workday shall not be assigned to shift work.

d) The employer shall notify the Union 24 hours prior to the start of shift work.

e) A Steamfitter or Apprentice shall not work more than one shift in a 24-hour period.

f) When shift work is performed, Steamfitters and/or Apprentices shall be paid the wage rate for regular time worked plus a 15% premium and regular fringe benefit contribution rate plus a 15% premium.

g) When the N.Y.S. Department of Transportation, a local School District, or any other Governmental Agency requires night shift work, employees shall be paid the wage rate for regular time worked plus a fifteen percent (15%) premium, together with the regular fringe benefit contribution plus a fifteen percent (15%) premium.

TERM OF THIS AGREEMENT

It is further mutually agreed that no change in this agreement shall be asked for by either party hereto, to take effect prior to the first day of July 1, 2023.

ARTICLE FIVE

It is understood and agreed that this agreement is based upon the Principles for Trade Agreements as set forth in the printed annex to this agreement, and nothing in the Rules of the Enterprise Association attached hereto, or within this agreement, shall be interpreted to contradict or nullify any of the said Principles.

It is agreed that the Favored Nation Clause as stated in the existing trade agreement is not applicable to the Public Works Supplement.

It is understood and agreed that in case any provision of this agreement shall be found to be contrary to law, such finding shall not in any way affect the other provisions of this agreement, which shall, notwithstanding,

continue in full force and effect and the parties shall within ten (10) days after receipt of written notice by one party to the other, negotiate in an attempt to arrive at an appropriate substitute provision in light of such ruling.

In the event of change of applicable Federal Laws affecting this agreement, by virtue of which change it shall become legal for the Enterprise Association to demand that only members of Enterprise Association be employed in the performance of work under its jurisdiction, or to institute what is commonly known as the "closed shop," the Employer agrees that in such event and on the giving of ten (10) days' notice to the Employer by Enterprise Association in writing by registered mail, this agreement shall be deemed amended to the end that on and after the conclusion of the said ten (10) days period only members of the Enterprise Association shall be employed by the Employer in the performance of work coming within the jurisdiction of Enterprise Association and only members of the Metal Trades Branch of Local Union 638 shall be employed in the performance of service work more particularly described in Rule XVI of this agreement.

INDEX FOR STEAMFITTING TRADE AGREEMENT

EMPLOYMENT APPLICATION

Application for Employment

It is the policy of C.D.E. Air Conditioning Co., Inc. not to discriminate against any employee or applicant for employment because of race, color, national origin, sex, age, disability, creed, marital status, sexual orientation or citizenship status.

PLEASE PRINT

Equal Access to programs, services and employment is available to all persons. Those applicants requiring reasonable accommodations for the application and/or interview process should notify a representative of the Human Resources Department of ___________________.

Position(s) applied for ______________________________ Date of application ___/___/___

Name ____
FIRST MIDDLE LAST

Address ____
STREET CITY STATE ZIP CODE

Telephone # (___) ____________ Additional Phone # (___) ____________ Social Security # ____________

If you are under 18, and it is required, can you furnish a work permit? ____Yes ____No

If no, please explain ____

Have you ever been employed here before? ____Yes ____No

Are you legally eligible for employment in this country? ____Yes ____No

Date available for work ___/___/___

Position desired: ______________________ Hourly rate or salary desired:: ______________

Type of employment desired _____ Full-Time _____ Part-Time _____Temporary _____Seasonal _____Educational Co-Op

Have you been convicted of a crime in the last seven (7) years? ____Yes ____No

If yes, please explain ____

CONVICTION WILL NOT NECESSARILY BE A BAR TO EMPLOYMENT. EACH INSTANCE AND EXPLANATION WILL BE CONSIDERED IN RELATION TO THE POSITION FOR WHICH YOU ARE APPLYING

Driver's license number if driving is an essential job function ______________________ State ______________

Are you currently employed? ______________________ May we contact your employer? _____Yes _____No

EMPLOYMENT HISTORY

Provide the following information for your past four (4) employers, assignments or volunteer activities, starting with the most recent.

FROM	TO	EMPLOYER	TELEPHONE ( )
JOB TITLE		ADDRESS	
IMMEDIATE SUPERVISOR AND TITLE		SUMMARIZE THE NATURE OF WORK PERFORMED AND JOB RESPONSIBILITIES	
REASON FOR LEAVING		HOURLY RATE/SALARY START $ _______ PER _______ FINAL $ _______ PER _______	
FROM	TO	EMPLOYER	TELEPHONE ( )
JOB TITLE		ADDRESS	
IMMEDIATE SUPERVISOR AND TITLE		SUMMARIZE THE NATURE OF WORK PERFORMED AND JOB RESPONSIBILITIES	
REASON FOR LEAVING		HOURLY RATE/SALARY START $ _______ PER _______ FINAL $ _______ PER _______	
FROM	TO	EMPLOYER	TELEPHONE ( )
JOB TITLE		ADDRESS	
IMMEDIATE SUPERVISOR AND TITLE		SUMMARIZE THE NATURE OF WORK PERFORMED AND JOB RESPONSIBILITIES	
REASON FOR LEAVING		HOURLY RATE/SALARY START $ _______ PER _______ FINAL $ _______ PER _______	

MEDICAL/NON-MEDICAL POLICY

321 - 39th Street
Brooklyn, NY 11232

Phone: (718) 788-1040
Fax: (718) 788-2046
www.cdeair.com

Medical / Non-Medical Leave

C.D.E. Air Conditioning Co., Inc. will provide family and medical leave in accordance with all applicable laws, including the New York Paid Family Leave policy.
Eligible employees can take Paid Family Leave to:

- Bond with a newly born, adopted or fostered child
- Care for a family member with a serious health condition
- Assist loved ones when a family member is deployed abroad for active military service

Employees are required to provide 30 days' advance notice of their intent to use Paid Family Leave if it is foreseeable. If it is not foreseeable, the employee must notify CDE as soon as is possible.

SEXUAL HARASSMENT POLICY

SEXUAL HARASMENT POLICY
C.D.E. Air Conditioning Co., Inc.
October 2018

Introduction

C.D.E. Air Conditioning Co., Inc. is committed to maintaining a workplace free from sexual harassment. Sexual harassment is a form of workplace discrimination. C.D.E. Air Conditioning Co., Inc. has a zero-tolerance policy for any form of sexual harassment, and all employees are required to work in a manner that prevents sexual harassment in the workplace. This Policy is one component of C.D.E. Air Conditioning Co., Inc.'s commitment to a discrimination-free work environment.

Sexual harassment is against the law. All employees have a legal right to a workplace free from sexual harassment, and employees can enforce this right by filing a complaint internally with C.D.E. Air Conditioning Co., Inc., or with a government agency or in court under federal, state or local antidiscrimination laws.

Policy:

1. C.D.E. Air Conditioning Co., Inc.'s policy applies to all employees, applicants for employment, interns, whether paid or unpaid, contractors and persons conducting business with C.D.E. Air Conditioning Co., Inc..

2. Sexual harassment will not be tolerated. Any employee or individual covered by this policy who engages in sexual harassment or retaliation will be subject to remedial and/or disciplinary action, up to and including termination.

3. Retaliation Prohibition: No person covered by this Policy shall be subject to adverse employment action including being discharged, disciplined, discriminated against, or otherwise subject to adverse employment action because the employee reports an incident of sexual harassment, provides information, or otherwise assists in any investigation of a sexual harassment complaint. C.D.E. Air Conditioning Co., Inc. has a zero-tolerance policy for such retaliation against anyone who, in good faith complains or provides information about suspected sexual harassment. Any employee of C.D.E. Air Conditioning Co., Inc. who retaliates against anyone involved in a sexual harassment investigation will be subjected to disciplinary action, up to and including termination. Any employee, paid or unpaid intern, or non-employee[1] working in the workplace who believes they have been subject to such retaliation should inform a supervisor, manager, or Brian Azara. Any employee, paid or unpaid intern or non-employee who believes they have been a victim of such retaliation may also seek compensation in other available forums, as explained below in the section on Legal Protections.

4. Sexual harassment is offensive, is a violation of our policies, is unlawful, and subjects C.D.E. Air

[1] A non-employee is someone who is (or is employed by) a contractor, subcontractor, vendor, consultant, or anyone providing services in the workplace. Protected non-employees include persons commonly referred to as independent contractors, "gig" workers and temporary workers. Also included are persons providing equipment repair, cleaning services or any other services provided pursuant to a contract with the employer.

Conditioning Co., Inc. to liability for harm to victims of sexual harassment. Harassers may also be individually subject to liability. Employees of every level who engage in sexual harassment, including managers and supervisors who engage in sexual harassment or who knowingly allow such behavior to continue, will be penalized for such misconduct.

5. C.D.E. Air Conditioning Co., Inc. will conduct a prompt, thorough and confidential investigation that ensures due process for all parties, whenever management receives a complaint about sexual harassment, or otherwise knows of possible sexual harassment occurring. Effective corrective action will be taken whenever sexual harassment is found to have occurred. All employees, including managers and supervisors, are required to cooperate with any internal investigation of sexual harassment.

6. All employees are encouraged to report any harassment or behaviors that violate this policy. C.D.E. Air Conditioning Co., Inc. will provide all employees a complaint form for employees to report harassment and file complaints.

7. Managers and supervisors are **required** to report any complaint that they receive, or any harassment that they observe to Brian Azara.

8. This policy applies to all employees, paid or unpaid interns, and non-employees and all must follow and uphold this policy. This policy must be posted prominently in all work locations and be provided to employees upon hiring.

What Is "Sexual Harassment"?

Sexual harassment is a form of sex discrimination and is unlawful under federal, state, and (where applicable) local law. Sexual harassment includes harassment on the basis of sex, sexual orientation, gender identity and the status of being transgender.

Sexual harassment includes unwelcome conduct which is either of a sexual nature, or which is directed at an individual because of that individual's sex when:

- Such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile or offensive work environment, even if the complaining individual is not the intended target of the sexual harassment;
- Such conduct is made either explicitly or implicitly a term or condition of employment; or
- Submission to or rejection of such conduct is used as the basis for employment decisions affecting an individual's employment.

A sexually harassing hostile work environment consists of words, signs, jokes, pranks, intimidation or physical violence which are of a sexual nature, or which are directed at an individual because of that individual's sex. Sexual harassment also consists of any unwanted verbal or physical advances, sexually explicit derogatory statements or sexually discriminatory remarks made by someone which are offensive or objectionable to the recipient, which cause the recipient discomfort or humiliation, which interfere with the recipient's job performance.

Sexual harassment also occurs when a person in authority tries to trade job benefits for sexual favors. This can include hiring, promotion, continued employment or any other terms, conditions or

privileges of employment. This is also called “quid pro quo” harassment.

Any employee who feels harassed should complain so that any violation of this policy can be corrected promptly. Any harassing conduct, even a single incident, can be addressed under this policy.

Examples of sexual harassment

The following describes some of the types of acts that may be unlawful sexual harassment and that are strictly prohibited:

- Physical assaults of a sexual nature, such as:
  - Touching, pinching, patting, grabbing, brushing against another employee’s body or poking another employees’ body;
  - Rape, sexual battery, molestation or attempts to commit these assaults.

- Unwanted sexual advances or propositions, such as:
  - Requests for sexual favors accompanied by implied or overt threats concerning the victim’s job performance evaluation, a promotion or other job benefits or detriments;
  - Subtle or obvious pressure for unwelcome sexual activities.

- Sexually oriented gestures, noises, remarks, jokes or comments about a person’s sexuality or sexual experience, which create a hostile work environment.

- Sexual or discriminatory displays or publications anywhere in the workplace, such as:
  - Displaying pictures, posters, calendars, graffiti, objects, promotional material, reading materials or other materials that are sexually demeaning or pornographic. This includes such sexual displays on workplace computers or cell phones and sharing such displays while in the workplace.

- Hostile actions taken against an individual because of that individual’s sex, sexual orientation, gender identity and the status of being transgender, such as:
  - Interfering with, destroying or damaging a person’s workstation, tools or equipment, or otherwise interfering with the individual’s ability to perform the job;
  - Sabotaging an individual’s work;
  - Bullying, yelling, name-calling.

Who can be a target of sexual harassment?

Sexual harassment can occur between any individuals, regardless of their sex or gender. New York Law protects employees, paid or unpaid interns, and non-employees, including independent contractors, and those employed by companies contracting to provide services in the workplace. A perpetrator of sexual harassment can be a superior, a subordinate, a coworker or anyone in the workplace including an independent contractor, contract worker, vendor, client, customer or visitor.

Where can sexual harassment occur?

Unlawful sexual harassment is not limited to the physical workplace itself. It can occur while employees are traveling for business or at employer sponsored events or parties. Calls, texts, emails, and social media usage by employees can constitute unlawful workplace harassment, even if they occur away from the workplace premises or not during work hours.

What is "Retaliation"?

Unlawful retaliation can be any action that would keep a worker from coming forward to make or support a sexual harassment claim. Adverse action need not be job-related or occur in the workplace to constitute unlawful retaliation.

Such retaliation is unlawful under federal, state, and (where applicable) local law. The New York State Human Rights Law protects any individual who has engaged in "protected activity." Protected activity occurs when a person has:

- filed a complaint of sexual harassment, either internally or with any anti-discrimination agency;
- testified or assisted in a proceeding involving sexual harassment under the Human Rights Law or other anti-discrimination law;
- opposed sexual harassment by making a verbal or informal complaint to management, or by simply informing a supervisor or manager of harassment;
- complained that another employee has been sexually harassed; or
- encouraged a fellow employee to report harassment.

Reporting Sexual Harassment

Preventing sexual harassment is everyone's responsibility. C.D.E. Air Conditioning Co., Inc. cannot prevent or remedy sexual harassment unless it knows about it. Any employee, paid or unpaid intern or non- employee who has been subjected to behavior that may constitute sexual harassment is encouraged to report such behavior to a supervisor, manager or Brian Azara. Anyone who witnesses or becomes aware of potential instances of sexual harassment should report such behavior to a supervisor, manager or Brian Azara.

Reports of sexual harassment may be made verbally or in writing. A form for submission of a written complaint is attached to this Policy, and all employees are encouraged to use this complaint form. Employees who are reporting sexual harassment on behalf of other employees should use the complaint form and note that it is on another employee's behalf.

Employees, paid or unpaid interns or non-employees who believe they have been a victim of sexual harassment may also seek assistance in other available forums, as explained below in the section on Legal Protections.

Supervisory Responsibilities

All supervisors and managers who receive a complaint or information about suspected sexual harassment, observe what may be sexually harassing behavior or for any reason suspect that sexual harassment is occurring, **are required** to report such suspected sexual harassment to Brian Azara.

In addition to being subject to discipline if they engaged in sexually harassing conduct themselves, supervisors and managers will be subject to discipline for failing to report suspected sexual harassment or otherwise knowingly allowing sexual harassment to continue.

Supervisors and managers will also be subject to discipline for engaging in any retaliation.

Complaint And Investigation Of Sexual Harassment

All complaints or information about suspected sexual harassment will be investigated, whether that information was reported in verbal or written form. Investigations will be conducted in a timely manner, and will be confidential to the extent possible.

An investigation of any complaint, information or knowledge of suspected sexual harassment will be prompt and thorough, and should be completed within 30 days. The investigation will be confidential to the extent possible. All persons involved, including complainants, witnesses and alleged perpetrators will be accorded due process to protect their rights to a fair and impartial investigation.

Any employee may be required to cooperate as needed in an investigation of suspected sexual harassment. Employees who participate in any investigation will not be retaliated against.

Investigations will be done in accordance with the following steps:

- Upon receipt of complaint, Brian Azara will conduct an immediate review of the allegations, and take any interim actions, as appropriate. If complaint is oral, encourage the individual to complete the “Complaint Form” in writing. If he or she refuses, prepare a Complaint Form based on the oral reporting.

- If documents, emails or phone records are relevant to the allegations, take steps to obtain and preserve them.

- Request and review all relevant documents, including all electronic communications.

- Interview all parties involved, including any relevant witnesses.

- Create a written documentation of the investigation (such as a letter, memo or email), which contains the following:
    - A list of all documents reviewed, along with a detailed summary of relevant documents;
    - A list of names of those interviewed, along with a detailed summary of their statements;
    - A timeline of events;
    - A summary of prior relevant incidents, reported or unreported; and
    - The final resolution of the complaint, together with any corrective actions action(s).

- Keep the written documentation and associated documents in the employer's records.
- Promptly notify the individual who complained and the individual(s) who responded of the final determination and implement any corrective actions identified in the written document.
- Inform the individual who complained of their right to file a complaint or charge externally as outlined below.

Legal Protections And External Remedies

Sexual harassment is not only prohibited by C.D.E. Air Conditioning Co., Inc. but is also prohibited by state, federal, and, where applicable, local law.

Aside from the internal process at C.D.E. Air Conditioning Co., Inc., employees may also choose to pursue legal remedies with the following governmental entities **at any time**.

New York State Division of Human Rights (DHR)

The Human Rights Law (HRL), codified as N.Y. Executive Law, art. 15, § 290 et seq., applies to employers in New York State with regard to sexual harassment, and protects employees, paid or unpaid interns and non-employees regardless of immigration status. A complaint alleging violation of the Human Rights Law may be filed either with DHR or in New York State Supreme Court.

Complaints with DHR may be filed any time **within one year** of the harassment. If an individual did not file at DHR, they can sue directly in state court under the HRL, **within three years** of the alleged discrimination. An individual may not file with DHR if they have already filed a HRL complaint in state court.

Complaining internally to C.D.E. Air Conditioning Co., Inc. does not extend your time to file with DHR or in court. The one year or three years is counted from date of the most recent incident of harassment.

You do not need an attorney to file a complaint with DHR, and there is no cost to file with DHR.

DHR will investigate your complaint and determine whether there is probable cause to believe that discrimination has occurred. Probable cause cases are forwarded to a public hearing before an administrative law judge. If discrimination is found after a hearing, DHR has the power to award relief, which varies but may include requiring your employer to take action to stop the harassment, or redress the damage caused, including paying monetary damages, attorney's fees and civil fines.

DHR's main office contact information is: NYS Division of Human Rights, One Fordham Plaza, Fourth Floor, Bronx, New York 10458, (718) 741-8400 [appropriate other contact info], www.dhr.ny.gov

Contact DHR at (888) 392-3644 or visit dhr.ny.gov/complaint for more information about filing a complaint. The website has a complaint form that can be downloaded, filled out, notarized and mailed to DHR. The website also contains contact information for DHR's regional offices across New York

State.

United States Equal Employment Opportunity Commission (EEOC)

The EEOC enforces federal anti-discrimination laws, including Title VII of the 1964 federal Civil Rights Act (codified as 42 U.S.C. § 2000e et seq.). An individual can file a complaint with the EEOC anytime within 300 days from the harassment. There is no cost to file a complaint with the EEOC. The EEOC will investigate the complaint and determine whether there is reasonable cause to believe that discrimination has occurred, at which point the EEOC will issue a Right to Sue letter permitting the individual to file a complaint in federal court.

The EEOC does not hold hearings or award relief, but may take other action including pursuing cases in federal court on behalf of complaining parties. Federal courts may award remedies if discrimination is found to have occurred.

If an employee believes that he/she has been discriminated against at work, he/she can file a "Charge of Discrimination." The EEOC has district, area, and field offices where complaints can be filed. Contact the EEOC by calling 1-800-669-4000 (1-800-669-6820 (TTY)), visiting their website at www.eeoc.gov or via email at info@eeoc.gov

If an individual filed an administrative complaint with DHR, DHR will file the complaint with the EEOC to preserve the right to proceed in federal court.

Local Protections

Many localities enforce laws protecting individuals from sexual harassment and discrimination. An individual should contact the county, city or town in which they live to find out if such a law exists. For example, employees who work in New York City may file complaints of sexual harassment with the New York City Commission on Human Rights. Contact their main office at Law Enforcement Bureau of the NYC Commission on Human Rights, 40 Rector Street, 10th Floor, New York, New York; call 311 or (212) 306-7450; or visit www.nyc.gov/html/cchr/html/home/home.shtml

Contact the Local Police Department

If the harassment involves physical touching, coerced physical confinement or coerced sex acts, the conduct may constitute a crime. Contact the local police department.

NYC Mayor's Office of Contract Services

SCHEDULE B – M/WBE Utilization Plan

Part 1: M/WBE Participation Goals

Contract Overview (To be completed by contracting agency)

APT E-Pin# TBD | FMS Project ID# LBC16MPHC

Project Title LBC16MPHC | Agency PIN# TBD

Contracting Agency Department of Design and Construction | Bid/Proposal Response Date 3/21/2023

Agency Address 30-30 Thomson Avenue | City Long Island City | State NY | ZIP 11101

Contact Person Maria Johnston | Title MWBE Outreach & Compliance Analyst

Telephone 718-391-1234 | Email latorrema@ddc.nyc.gov

Project Description (attach additional pages if necessary)

Replacement of HVAC, Fire Alarm and BMS.

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

M/WBE Participation Goals for Services

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

Prime Contract Industry: Construction

Category and Breakdown:

Unspecified	7.00 %
Black American	14.00 %
Hispanic American	10.00 %
Asian American	%
Women	%
Total Participation Goals	**31.00 %**

Line 1

Part 2: M/WBE Participation Plan

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

Section 1: Prime Contractor Contact Information

Tax ID# 11-2217107 | FMS Vendor ID# 0000477680

Business Name C.D.E. Air Conditioning Co., Inc. | Contact Person Joseph F. Azara

Business Address 321 39th Street | City Brooklyn | State NY | ZIP 11232

Telephone 718-788-1040 | Email josepha@cdeair.com

Section 3: Contractor M/WBE Utilization Plan

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

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

☐ As a Qualified Joint Venture with an M/WBE partner, in which the value of the M/WBE partner's participation and/or the value of any work subcontracted to other M/WBE firms is at least the amount located on Lines 2 or 3 in the panels in Section 2, as applicable. The value of any work subcontracted to non-M/WBE firms will not be credited towards fulfillment of M/WBE Participation Goals.

☒ As a non-M/WBE Prime Contractor that will enter into subcontracts with M/WBE firms the value of which is at least the amount located on Lines 2 or 3 in the panels in Section 2, as applicable.

Section 2: M/WBE Utilization Goal Calculation

Prime Contractor Adopting Agency Participation Goals

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

Total Bid/Proposal Value $ 4,667,813.00

multiplied by x

Total Participation Goals 31.00 % *(Line 1 above)*

Calculated M/WBE Participation Amount $ 1,447,022.03 *Line 2*

OR

Prime Contractor With Partial Waiver Approval Adopting Revised Participation Goals

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

Total Bid/Proposal Value $ _____

multiplied by x

Total Revised Participation Goals _____ %

Calculated M/WBE Participation Amount $ _____ *Line 3*

Tax ID# 11-2217107 APT E-Pin#

Section 4: General Contract Information

What is the expected percentage of the total contract dollar value that you expect to award in subcontracts for services, regardless of M/WBE status? 50.00 %

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

	Description of Work	Start Date (MM/YY)	End Date (MM/YY)	Planned $ Amount	Designated for M/WBE Y	Designated for M/WBE N	M/WBE Vendor Name	M/WBE Address	M/WBE Telephone
1.	Electric Work	5 / 23	11 / 24	$ 897,800.00	☒	☐	GSH Electric Inc.	491 E. 166th St. Bronx, NY 10456	(718) 585 - 4100
2.	Steel Work	5 / 23	11 / 24	$ 343,500.00	☒	☐	North American Mfg. Corp.	59-12 54th St. Maspeth, NY 11378	(631) 205 - 8755
3.	Control Wiring	5 / 23	11 / 24	$ 125,000.00	☒	☐	TBD (Hispanic American)		( ) -
4.	GC Work/Demolition	5 / 23	11 / 24	$ 850,000.00	☒	☐	BTG Contracting LLC	223 Wall Street # 222, Huntington, NY 11743	(631) 424 - 943
5.	Plumbing	5 / 23	11 / 24	$ 16,254.00	☐	☒	Louis L. Buttermark & Sons Inc.	16 New Dorp Lane, Staten Island, NY 10306	(718) 351 - 4220
6.	Roofing	5 / 23	11 / 24	$ 175,000.00	☐	☒	TBD		( ) -
7.	Piping	5 / 23	11 / 24	$ 180,000.00	☐	☒	TBD		( ) -
8.	Balancing	5 / 23	11 / 24	$ 13,500.00	☐	☒	TBD		( ) -
9.	Insulation	5 / 23	11 / 24	$ 80,000.00	☐	☒	TBD		( ) -
10.	Ductwork	5 / 23	11 / 24	$ 315,000.00	☐	☒	TBD		( ) -

Section 5: Vendor Certification and Required Affirmations

I hereby:

1. *acknowledge my understanding of the M/WBE participation requirements as set forth herein and the pertinent provisions of Section 6-129 of the Administrative Code of the City of New York ("Section 6-129"), and the rules promulgated thereunder;*
2. *affirm that the information supplied in support of this M/WBE Utilization Plan is true and correct;*
3. *agree, if awarded this Contract, to comply with the M/WBE participation requirements of this Contract, the pertinent provisions of Section 6-129, and the rules promulgated thereunder, all of which shall be deemed to be material terms of this Contract;*
4. *agree and affirm that it is a material term of this Contract that the Vendor will award the total dollar value of the M/WBE Participation Goals to certified MBEs and/or WBEs, unless a full waiver is obtained or such Goals are modified by the Agency; and*
5. *agree and affirm, if awarded this Contract, to make all reasonable, good faith efforts to meet the M/WBE Participation Goals, or If a partial waiver is obtained or such Goals are modified by the Agency, to meet the modified Participation Goals by soliciting and obtaining the participation of certified MBE and/or WBE firms.*

Signature Brian J. Azara Date 3/28/23

Print Name Brian J. Azara Title Corporate Secretary

Department of Design and Construction

PROJECT ID: **LBC16MPHC**

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

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

VOLUME 2 OF 3

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

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

Mapleton Branch Library HVAC Replacement

LOCATION: **1702 60th Street**
BOROUGH: **Brooklyn, NY 11211**
CITY OF NEW YORK

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

Brooklyn Public Library

Loring Consulting Engineers, Inc.

Date: **November 3, 2022**

Department of Design and Construction

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

30-30 THOMSON AVENUE
LONG ISLAND CITY, NEW YORK 11101-3045
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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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District Councils & Affiliates Contact Information

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Teamsters Local 282
2500 Marcus Avenue
Lake Success, NY 11042
Business Manager: Tom Gesauldi
P: 516-488-2822 #141
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Teamsters Local 814
21-42 44th Drive
LIC, NY 11101
Business Manager: Jason Ide
P: 718-609-6407
email: jasonI@ibt814.com

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

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

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

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

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

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

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

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

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

Carpenters District Council

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

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

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

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

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

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

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

Concrete Workers District Council No. 16

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

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

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

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

Iron Workers District Council

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

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

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

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

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

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

Mason Tenders District Council

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

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

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

Painters District Council # 9

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

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

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

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

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

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

2020 – 2024

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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: _____

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

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

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

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

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

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

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

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

Local Union: _____

Description of Work: _____

_____

Contract Number(s): _____

Dated: _____

_____
(Name of Contractor or subcontractor)

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

_____
(Authorized Officer & Title)

_____
(Address)

_____
(Signature)

_____
(Phone) (Fax)

Contractor's State License #_____

Sworn to before me this
____ day of _____,

_____
Notary Public

Exhibit B

NEW YORK CITY BUILDING AND CONSTRUCTION TRADES COUNCIL STANDARDS OF EXCELLENCE

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

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

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

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

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

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

Exhibit "C" - HireNYC Construction Careers

(August 2020 version)

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

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

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

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

(Zip codes within ~100 mile radius of NYC)

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

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

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

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

(Zip codes within ~100 mile radius of NYC)

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

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

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

(Zip codes within ~100 mile radius of NYC)

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

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

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

(Zip codes within ~100 mile radius of NYC)

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

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

EXHIBIT "D"
MEMORANDUM OF UNDERSTANDING

MEMORANDUM OF UNDERSTANDING, entered into as of _____, between the City of New York ("City") with an office located at City Hall, New York, NY 10007, the Building and Construction Trades Council of Greater New York and Vicinity ("BCTC"), on its behalf and on behalf of its affiliated unions, with its principal place of business located at 350 West 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

TABLE OF CONTENTS

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

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 Non-Compensable Delays and Grounds for Extension;
- Rider regarding NYC Earned Safe and Sick Time Act.

Other than provisions specifically delineated in the Riders, all other terms of the March 2017 New York City Standard Construction Contract continue to apply in full force and effect.

RIDER TO NEW YORK CITY STANDARD CONSTRUCTION CONTRACT (MARCH 2017) REGARDING NON-COMPENSABLE DELAYS AND GROUNDS FOR EXTENSION

The following provisions supersede the corresponding provisions in the March 2017 version of the New York City Standard Construction Contract:

1. Section **11.5.1** provides as follows:

   11.5.1 The acts or omissions of public or government bodies (other than **City** agencies) or of any third parties who are disclosed in the **Contract Documents,** or those third parties who are ordinarily encountered or who are generally recognized as related to the **Work**, including but not limited to, **Other Contractors**, utilities or private enterprises;

2. Section **11.5.6** provides as follows:

   11.5.6 Climatic conditions, storms, floods, droughts, tidal waves, fires, hurricanes, earthquakes, landslides or other catastrophes or acts of God; acts of war or of the public enemy or terrorist acts; disruption, outage or power failure caused by a utility's inability or failure to provide service, pandemics, epidemics, outbreaks of infectious disease or any other public health emergency; other states of emergency declared by the City, State or Federal government , quarantine restrictions, and freight embargoes; including the **City's** reasonable responses to any of the above; and

3. Section **13.3** provides as follows:

   13.3 Grounds for Extension: If such application is made, the **Contractor** shall be entitled to an extension of time for delay in completion of the **Work** caused solely:

   13.3.1 By any of the acts or omissions of the **City**, its officials, agents or employees set forth in Articles **11.4.1.1** through **11.4.1.9**; or

   13.3.2 By or attributable to any of the items set forth in Articles **11.5.1** through **11.5.7**.

   13.3.3 The **Contractor** shall, however, be entitled to an extension of time for such causes only for the number of **Days** of delay which the **ACCO** or the Board may determine to be due solely to such causes, and then only if the **Contractor** shall have strictly complied with all of the requirements of Articles 9 and 10.

NYC EARNED SAFE AND SICK TIME ACT CONTRACT RIDER

(To supersede Section 4.06 of the January 2018 Appendix A and Section 35.5 of the March 2017 Standard Construction Contract and to be attached to other City contracts and solicitations)

A. *Introduction and General Provisions.*

1. The Earned Safe and Sick Time Act ("ESSTA"), codified at Title 20, Chapter 8 of the New York City Administrative Code, also known as the "Paid Safe and Sick Leave Law," requires covered employees (as defined in Admin. Code § 20-912) in New York City ("City") to be provided with paid safe and sick time. Contractors of the City or of other governmental entities may be required to provide safe and sick time pursuant to the ESSTA. The ESSTA is enforced by the City's Department of Consumer and Worker Protection ("DCWP"), which has promulgated 6 RCNY §§ 7-101 and 201 *et seq*. ("DCWP Rules").

2. The Contractor agrees to comply in all respects with the ESSTA and the DCWP Rules, and as amended, if applicable, in the performance of this agreement. The Contractor further acknowledges that such compliance is a material term of this agreement and that failure to comply with the ESSTA in performance of this agreement may result in its termination.

3. The Contractor must notify (with a copy to DCWP at ComplianceMonitoring@dcwp.nyc.gov) the Agency Chief Contracting Officer of the City Agency or other entity with whom it is contracting in writing within 10 days of receipt of a complaint (whether oral or written) or notice of investigation regarding the ESSTA involving the performance of this agreement. Additionally, the Contractor must cooperate with DCWP's guidance and must comply with DCWP's subpoenas, requests for information, and other document demands as set forth in the ESSTA and the DCWP Rules. More information is available at https://www1.nyc.gov/site/dca/about/paid-sick-leave-what-employers-need-to-know.page.

4. Upon conclusion of a DCWP investigation, Contractor will receive a findings letter detailing any employee relief and civil penalties owed. Pursuant to the findings, Contractor will have the opportunity to settle any violations and cure the breach of this agreement caused by failure to comply with the ESSTA either i) without a trial by entering into a consent order or ii) appearing before an impartial judge at the City's administrative tribunal. In addition to and notwithstanding any other rights and remedies available to the City, non-payment of relief and penalties owed pursuant to a consent order or final adjudication within 30 days of such consent order or final adjudication may result in the termination of this agreement without further opportunity to settle or cure the violations.

5. The ESSTA is briefly summarized below for the convenience of the Contractor. The Contractor is advised to review the ESSTA and the DCWP Rules in their entirety. The Contractor may go to www.nyc.gov/PaidSickLeave for resources for employers, such as Frequently Asked Questions, timekeeping tools and model forms, and an event calendar of upcoming presentations and webinars at which the Contractor can get more information about how to comply with the ESSTA and the DCWP Rules. The Contractor acknowledges that it is responsible for compliance with the ESSTA and the DCWP Rules notwithstanding any inconsistent language contained herein.

B. *Pursuant to the ESSTA and DCWP Rules: Applicability, Accrual, and Use.*

1. An employee who works within the City must be provided paid safe and sick time.[1] Employers with one hundred or more employees are required to provide 56 hours of safe and sick time for an employee each calendar year. Employers with fewer than one hundred employees are required to provide 40 hours of sick leave each calendar year. Employers must provide a minimum of one hour of safe and sick time for every 30 hours worked by an employee and compensation for such safe and sick time must be provided at the greater of the employee's regular hourly rate or the minimum wage at the time the paid safe or sick time is taken. Employers are not discouraged or prohibited from providing more generous safe and sick time policies than what the ESSTA requires.

2. Employees have the right to determine how much safe and sick time they will use, provided that an employer may set a reasonable minimum increment for the use of safe and sick time not to exceed four hours per day. For the use of safe time or sick time beyond the set minimum increment, an employer may set fixed periods of up to thirty minutes beyond the minimum increment. In addition, an employee may carry over up to 40 or 56 hours of unused safe and sick time to the following calendar year, provided that no employer is required to carry over unused paid safe and sick time if the employee is paid for such unused safe and sick time and the employer provides the employee with at least the legally required amount of paid safe and sick time for such employee for the immediately subsequent calendar year on the first day of such calendar year.

3. An employee entitled to safe and sick time pursuant to the ESSTA may use safe and sick time for any of the following:

a. such employee's mental illness, physical illness, injury, or health condition or the care of such illness, injury, or condition or such employee's need for medical diagnosis or preventive medical care;

b. such employee's care of a family member (an employee's child, spouse, domestic partner, parent, sibling, grandchild, or grandparent, the child or parent of an employee's spouse or domestic partner, any other individual related by blood to the employee, and any other individual whose close association with the employee is the equivalent of a family relationship) who has a mental illness, physical illness, injury or health condition or who has a need for medical diagnosis or preventive medical care;

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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.

CITY OF NEW YORK

STANDARD CONSTRUCTION CONTRACT

March 2017

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CITY OF NEW YORK STANDARD CONSTRUCTION CONTRACT

TABLE OF CONTENTS

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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.

Exhibit A

Project Labor Agreement - Letter of Assent

Dear: 3/29/2023

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 Mapleton Branch Library (hereinafter PROJECT), for and in consideration of the award to it of a contract to perform work on said PROJECT, and in further consideration of the mutual promises made in the Project Labor Agreement, a copy of which was received and is acknowledged, hereby:

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

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

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

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

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

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

Local Union: Local 638

Description of Work: HVAC Replacement

Contract Number(s): LBC16MPHC

Dated: 3/29/23

C.D.E. Air Conditioning Co., Inc.
(Name of CM; GC; Contractor or Higher Level Subcontractor)

(Signature)

N/A
(Name of Contractor or subcontractor)

President
(Authorized Officer & Title)

321 39th Street, Brooklyn, NY 11232
(Address)

718-788-1040 / 718-788-2046
(Phone) (Fax)

Contractor's State License
N/A

Sworn to before me this
29th day of March, 2023

Notary Public

PAULA BRAVO
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01BR6367980
Qualified in KINGS County
Commission Expires 12/04/2025

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 **CDE AIR CONDITIONING CO INC** ("Contractor").

This Contract consists of this contract signature page as well as the following documents ("Contract Documents") which are located in the Documents tab of the PASSPort record titled **85023B0033-LBC16MPHC** .

1. **(Bid) - 01 - Subcontractor_ID_Form__GC_ (4) - CDE Air Conditioning Co., Inc..pdf - Aug 22 2023 7:06PM**
2. **(Question answer) - 03 - BID_BOND_FORM (11) - CDE Air Conditioning Co., Inc..pdf - Aug 22 2023 7:06PM**
3. **(Question answer) - 2020.pdf - Aug 22 2023 7:06PM**
4. **(Question answer) - 2021.pdf - Aug 22 2023 7:06PM**
5. **(Question answer) - 2022.pdf - Aug 22 2023 7:06PM**
6. **Bid Breakdown - Aug 24 2023 6:16PM**
7. **Broker's Certification - Aug 24 2023 4:58PM**
8. **Contract Drawings (Addendum 3) - Aug 22 2023 7:06PM**
9. **Disability Insurance - Aug 24 2023 5:01PM**
10. **DLS Approval - Aug 24 2023 6:18PM**
11. **General Liability - Aug 24 2023 5:02PM**
12. **LBC16MPHC_Addendum1 - Aug 22 2023 7:06PM**
13. **LBC16MPHC_Addendum2 - Aug 22 2023 7:06PM**
14. **LBC16MPHC_Addendum3 - Aug 22 2023 7:06PM**
15. **LBC16MPHC_Proprietary Items - Aug 22 2023 7:06PM**
16. **LBC16MPHC_Volume2 - Aug 22 2023 7:06PM**
17. **LBC16MPHC_Volume3_Addendum1 - Aug 22 2023 7:06PM**
18. **Payment & Performance Bond - Aug 24 2023 5:04PM**
19. **PLA - Aug 24 2023 6:21PM**
20. **Proposal/Bid - Aug 22 2023 7:06PM**
21. **RFx Document - Aug 22 2023 7:06PM**
22. **Schedule B - Aug 24 2023 6:17PM**
23. **Volume 1 (PLA) - Aug 22 2023 7:06PM**
24. **Workers Compensation - Aug 24 2023 5:05PM**

The above order does not represent an order of precedence. The Contract shall be governed by the order of precedence, if any, in the Contract Documents or by ordinary contract principles if no such order of precedence exists.

Each party is signing this Contract electronically on the date stated in that party's electronic signature.

The City of New York
By: **DEPARTMENT OF DESIGN AND CONSTRUCTION**

DocuSigned by:
Thomas Foley
FE0ABB939FF24B0...
(Signature)

Name: Thomas Foley

Title: Commissioner

Date: 9/7/2023 | 09:39:33 EDT

Contractor

By: **CDF AIR CONDITIONING CO INC**

DocuSigned by:
Brian J Azara
03ED4A8C7D5146B...

(Signature)

Name: Brian J Azara

Title: Corporate Secretary

Date: 9/6/2023 | 14:12:48 EDT

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.

USI INSURANCE SERVICES LLC

[Name of broker or agent (typewritten)]

333 WESTCHESTER AVE, SUITE 102, WHITE PLAINS, NY 10604

[Address of broker or agent (typewritten)]

BRYAN.MCELWAIN@USI.COM

[Email address of broker or agent (typewritten)]

(914) 459-6200 // (610) 537-4220

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

[Signature of authorized official or broker or agent]

BRYAN MCELWAIN - SENIOR ACCOUNT MANAGER

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

State of ....NEW YORK.....)
) ss:
County of ..WESTCHESTER.....)

Sworn to before me this

23 day of AUGUST, 2023

MAUREEN A KITTRICK
NOTARY PUBLIC STATE OF NEW YORK
LIC. #01KI4986881
COMMISSION EXPIRES 09/30/2025

NOTARY PUBLIC FOR THE STATE OF NEW YORK

Client#: 484097 CDEAIR

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 9/11/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer any rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
USI Insurance Services LLC
333 Westchester Ave, Suite 102
White Plains, NY 10604
914 459-6200

CONTACT NAME: Bryan McElwain
PHONE (A/C, No, Ext): 914 459-6200 **FAX (A/C, No):** 610 537-4220
E-MAIL ADDRESS: bryan.mcelwain@usi.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Travelers Property Cas. Co. of America	25674
INSURER B : Travelers Indemnity Company	25658
INSURER C : Navigators Insurance Company	42307
INSURER D : Travelers Indemnity Co of America	25666
INSURER E :	
INSURER F :	

INSURED
C.D.E. Air Conditioning Co., Inc.
321 39th St.
Brooklyn, NY 11232

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY			DT1NCO0L936869TIL	09/13/2023	09/13/2024	EACH OCCURRENCE	$2,000,000
	CLAIMS-MADE X OCCUR			23			DAMAGE TO RENTED PREMISES (Ea occurrence)	$300,000
	X BI/PD Ded:15000						MED EXP (Any one person)	$5,000
							PERSONAL & ADV INJURY	$2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$4,000,000
	POLICY X PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$4,000,000
	OTHER:							$
D	AUTOMOBILE LIABILITY			BA4N1759542326G	09/13/2023	09/13/2024	COMBINED SINGLE LIMIT (Ea accident)	$1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS ONLY / X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
B	X UMBRELLA LIAB X OCCUR			CUP1L5916152326	09/13/2023	09/13/2024	EACH OCCURRENCE	$3,000,000
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$3,000,000
	DED X RETENTION $10000							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						PER STATUTE / OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED?	N / A					E.L. EACH ACCIDENT	$
	(Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
C	Excess Liability			NY23EXCZ08ZJKIV	09/13/2023	09/13/2024	$8,000,000 OCC/AGG	
C	Pollution Liab.			NY23ECPX00303NV	09/13/2023	09/13/2024	$5,000,000 EACH POL/AGG	

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

RE: PROJECT ID #LBC16MPHC -- MAPLETON BRANCH LIBRARY HVAC REPLACEMENT
BROOKLYN PUBLIC LIBRARY AND THE CITY OF NEW YORK, INCLUDING ITS OFFICIALS AND EMPLOYEES ARE INCLUDED AS ADDITIONAL INSURED ON A PRIMARY AND NON-CONTRIBUTORY BASIS WHEN REQUIRED BY WRITTEN CONTRACT TO THE FULLEST EXTENT OF THE LAW. WAIVER OF SUBROGATION EXISTS IN FAVROR OF BROOKLYN PUBLIC LIBRARY AND THE CITY OF NEW YORK, INCLUDING ITS OFFICIALS AND EMPLOYEES WHEN REQUIRED BY WRITTEN CONTRACT TO THE FULLEST EXTENT OF THE LAW.

CERTIFICATE HOLDER
NEW YORK CITY DEPARTMENT OF
DESIGN & CONSTRUCTION
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
Ulle Scott

This page has been left blank intentionally.

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)

CDE AIR CONDITIONING CO., INC.
321 39TH ST
BROOKLYN, NY 11232

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) 788-1040

1c. Federal Employer Identification Number of Insured or Social Security Number

112217107

2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder)

NEW YORK CITY DEPARTMENT OF DESIGN & CONSTRUCTION
30-30 THOMSON AVENUE
LONG ISLAND CITY NY 11101

3a. Name of Insurance Carrier

HARTFORD LIFE AND ACCIDENT INSURANCE COMPANY

3b. Policy Number of Entity Listed in Box 1a

0DB099080000

3c. Policy effective period

10-01-2023 to 09-30-2024

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 10-10-2023 **By** *Elizabeth Tello*

(Signature of insurance carrier's authorized representative or NYS licensed insurance agent of that insurance carrier)

Telephone Number (212) 553-8074 Name and Title: ELIZABETH TELLO – ASSISTANT DIRECTOR, STATUTORY SERVICES

IMPORTANT: If Boxes 4A and 5A are checked, and this form is signed by the insurance carrier's authorized representative or NYS Licensed Insurance Agent of that carrier, this certificate is COMPLETE. Mail it directly to the certificate holder.

If Box 4B, 4C or 5B is checked, this certificate is NOT COMPLETE for purposes of Section 220, Subd. 8 of the NYS Disability and Paid Family Leave Benefits Law. It must be 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.***

DB-120.1 (12-21)

NYSIF
New York State Insurance Fund

PO Box 66699, Albany, NY 12206
| nysif.com

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

^ ^ ^ ^ ^ ^ 112217107

C. D. E. AIR-CONDITIONING CO.,INC.
321 39TH STREET
BROOKLYN NY 11232

SCAN TO VALIDATE
AND SUBSCRIBE

POLICYHOLDER	CERTIFICATE HOLDER
C. D. E. AIR-CONDITIONING CO.,INC. 321 39TH STREET BROOKLYN NY 11232	NYC DEPARTMENT OF DESIGN AND CONSTRUCTION 30-30 THOMSON AVENUE LONG ISLAND CITY NY 11101

POLICY NUMBER	CERTIFICATE NUMBER	POLICY PERIOD	DATE
G 1101 202-8	164932	05/01/2023 TO 05/01/2024	04/05/2023

THIS IS TO CERTIFY THAT THE POLICYHOLDER NAMED ABOVE IS INSURED WITH THE NEW YORK STATE INSURANCE FUND UNDER POLICY NO. 1101 202-8, COVERING THE ENTIRE OBLIGATION OF THIS POLICYHOLDER FOR WORKERS' COMPENSATION UNDER THE NEW YORK WORKERS' COMPENSATION LAW WITH RESPECT TO ALL OPERATIONS IN THE STATE OF NEW YORK, EXCEPT AS INDICATED BELOW.

IF YOU WISH TO RECEIVE NOTIFICATIONS REGARDING SAID POLICY, INCLUDING ANY NOTIFICATION OF CANCELLATIONS, OR TO VALIDATE THIS CERTIFICATE, VISIT OUR WEBSITE AT HTTPS://WWW.NYSIF.COM/CERT/CERTVAL.ASP. THE NEW YORK STATE INSURANCE FUND IS NOT LIABLE IN THE EVENT OF FAILURE TO GIVE SUCH NOTIFICATIONS.

THIS CERTIFICATE DOES NOT APPLY TO THOSE JOB SITES WHICH ARE COVERED BY OTHER INSURANCE AND ARE SPECIFICALLY EXCLUDED BY ENDORSEMENT.

THE POLICY INCLUDES A WAIVER OF SUBROGATION ENDORSEMENT UNDER WHICH NYSIF AGREES TO WAIVE ITS RIGHT OF SUBROGATION TO BRING AN ACTION AGAINST THE CERTIFICATE HOLDER TO RECOVER AMOUNTS WE PAID IN WORKERS' COMPENSATION AND/OR MEDICAL BENEFITS TO OR ON BEHALF OF AN EMPLOYEE OF OUR INSURED IN THE EVENT THAT, PRIOR TO THE DATE OF THE ACCIDENT, THE CERTIFICATE HOLDER HAS ENTERED INTO A WRITTEN CONTRACT WITH OUR INSURED THAT REQUIRES THAT SUCH RIGHT OF SUBROGATION BE WAIVED.

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS NOR INSURANCE COVERAGE UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICY.

NEW YORK STATE INSURANCE FUND

DIRECTOR, INSURANCE FUND UNDERWRITING

VALIDATION NUMBER: 720210334

00000000000114162590

PERFORMANCE BOND #1

Performance Bond #1 (4 Pages): Use if the total contract price is $5 Million Or Less. Performance Bond #1 has been approved by the U.S. Small Business Administration ("SBA")for participation in its Bond Guarantee Program.

PERFORMANCE BOND #1 (Page 1)

KNOW ALL PERSONS BY THESE PRESENTS:,
That we, C.D.E. Air Conditioning Co., Inc.

321 39th Street, Brooklyn, NY 11232

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

175 Berkeley Street, Boston MA 02116

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 ----------

---

Four Million Six Hundred Eighty Two Thousand Eight Hundred Thirteen Dollars and 00/100

($ 4,682,813.00----------) Dollars, lawful money of the United States for the payment of whichsaid sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

Project ID: LBC16MPHC

Mapleton Branch Library HVAC Replacement

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth infull;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the City from all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making good any such default and shall protect the said City of New York against, and pay any and all amounts, damages, cost and judgments which may or shall be recovered against said City or its officers or agents or which the said City of New York may be called upon to pay any person or corporation by reason of any damages arising or growing out of the Principal's default of the Contract, then this obligation shall be nulland void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the Citythat the City has determined that the Principal is in default of the Contract, to (1) pay the City the cost tocomplete the contract as determined by the City in excess of the balance of the Contract held by the City, plus any damages or costs to which the City is entitled, up to the full amount of the above penal sum, (2)fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof, or (3) tender a completion Contractor that is acceptable to the City. The Surety (Sureties) further agrees, at its option, either to notify the City that it elects to pay the city thecost of completion plus any applicable damages and costs under option (1) above, or to commence anddiligently perform the Work specified in the Contract, including physical site work, within twenty-five
(25) business days after written notice thereof from the City and, if the Surety elects to fully perform and complete the Work, then to complete all Work within the time set forth in the Contract or such other timeas agreed to between the City and Surety in accordance with the Contract. If the Surety elects to tender payment pursuant to (1) above, then the Surety shall tender such amount within fifteen (15) business days notification from the City of the cost of completion. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to pay the City the costof completion, to commence and complete all Work as provided herein, or to tender a completion contractor.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected byany extension of time, modification, omission, addition, or change in or to the said Contract or the Workto be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions,changes, payments, and waivers, and hereby expressly stipulates and agrees that any and all things doneand omitted to be done by and in relation to subcontractors shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal. Notwithstanding the above, if the City makes payments to the Principal before the time required by the contract that in the aggregate exceed $100,000 or 10% of the Contract price, whichever is less, and that have not become earned prior to the Principal being found to be in default, then all payments made to the Principal before the time required by the Contract shall be added to the remaining contract value available to be paid forthe completion of the Contract as if such sums had not been paid to the Principal, but shall not provide abasis for non-performance of its obligation to pay the City the cost of completion, to commence and to complete all Work as provided herein, or to tender a completion contractor.

IN WITNESS WHEREOF, The Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this

23rd day of August, 20 23 .(Seal)

C.D.E. Air Conditioning Co., Inc. (L.S.)
Principal

(Seal)

By: _____

Surety
Liberty Mutual Insurance Company

By: Andrea E. Gorbert
Andrea E. Gorbert, Attorney-In-Fact
Surety

(Seal)

By: _____
_____
Surety

(Seal)

By: _____
_____
Surety

(Seal)

By: _____
_____
Surety

(Seal)

By: _____

Bond Premium Rate Sliding Scale

Bond Premium Cost $26,764.00

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

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

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

ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION

State of New York County of Kings ss:

On this 24th day of August, 20 23 before me personally came Joseph F. Azara,
to me known, who, being by me duly sworn did depose and say that he/she resides at Staten Island, New York; that he/she is the President of the corporation described in and which executed the foregoing instrument; and that he/she signed his/her name to the foregoing instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

Paula Bravo
Notary Public or Commissioner of Deeds.

PAULA BRAVO
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01BR6367980
Qualified in KINGS County
Commission Expires 12/04/2025

ACKNOWLEDGMENT OF PRINCIPAL IF A PARTNERSHIP

State of _____ County of _____ ss:

On this _____ day of _____, 20 _____ before me personally came _____,
to me known, who, being by me duly sworn did dispose and say that he/she resides at _____; that he/she is _____ partner of _____, a limited/general partnership existing under the laws of the State of _____, the partnership described in and which executed the foregoing instrument; and that he/she signed his/her name to the foregoing instrument as the duly authorized and binding act of said partnership.

_____
Notary Public or Commissioner of Deeds.

ACKNOWLEDGMENT OF PRINCIPAL IF AN INDIVIDUAL

State of _____ County of _____ ss:

On this _____ day of _____, 20 _____ before me personally came _____,
to me known, who, being by me duly sworn did depose and say that he/she resides at _____, and that he/she is the individual whose name is subscribed to the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed the instrument.

_____
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * * * * *

Affix Acknowledgments and Justification of Sureties.

ACKNOWLEDGEMENT OF SURETY COMPANY

STATE OF **New York**

COUNTY OF **Nassau**

ON THE 23rd DAY OF August, 2023 BEFORE ME PERSONALLY APPEARED **Andrea E. Gorbert** TO ME KNOWN, WHO BEING BY ME DULY SWORN, DID DEPOSE AND SAY; THAT (S)HE IS THE ATTORNEY-IN-FACT OF **Liberty Mutual Insurance Company** THE CORPORATION THAT EXECUTED THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED TO ME THAT SUCH CORPORATION EXECUTED THE SAME.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIXED MY OFFICIAL SEAL, AT MY OFFICE IN THE ABOVE COUNTY, THE DAY AND YEAR WRITTEN ABOVE.

Notary Public

MARIYA Y LEONIDOV
NOTARY PUBLIC-STATE OF NEW YORK
No. 01LE6387977
Qualified In Nassau County
My Commission Expires 02-25-2027

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

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

Certificate No: **8210512-985164**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Andrea E. Gorbert; Kevin T. Walsh, Jr.; Mariya Leonidov; Michael Marino

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

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 31st day of July, 2023.

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

By: _____
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 31st day of July, 2023 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

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

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

By: _____
Teresa Pastella, Notary Public

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

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts: Section 5. Surety Bonds and Undertakings.
Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

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

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

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

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 23rd day of August, 2023.

By: _____
Renee C. Llewellyn, Assistant Secretary

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

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

LIBERTY MUTUAL INSURANCE COMPANY

Financial Statement – December 31, 2022

Assets

Cash and Bank Deposits	$3,908,755,039
*Bonds — U.S Government	3,451,999,931
*Other Bonds	18,862,255,155
*Stocks	19,372,953,698
Real Estate	190,092,373
Agents' Balances or Uncollected Premiums	7,929,876,358
Accrued Interest and Rents	166,740,412
Other Admitted Assets	15,968,062,977
Total Admitted Assets	**$69,850,735,943**

Liabilities

Unearned Premiums	$10,133,358,204
Reserve for Claims and Claims Expense	27,953,643,316
Funds Held Under Reinsurance Treaties	368,610,620
Reserve for Dividends to Policyholders	1,379,296
Additional Statutory Reserve	197,278,000
Reserve for Commissions, Taxes and Other Liabilities	9,206,000,954
Total	**$47,860,270,390**
Special Surplus Funds	$195,696,103
Capital Stock	10,000,075
Paid in Surplus	13,324,803,036
Unassigned Surplus	8,459,966,339
Surplus to Policyholders	**21,990,465,553**
Total Liabilities and Surplus	**$69,850,735,943**

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

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

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

T A Mikolajewski

Assistant Secretary

PERFORMANCE BOND #2

Performance Bond #2 (4 pages): Use if the total contract price is more than $5 Million.

PERFORMANCE BOND #2 (Page 1)

PERFORMANCE BOND #2KNOW ALL PERSONS BY THESE PRESENTS:,

That we, _____

_____

_____

hereinafter referred to as the "Principal,"
and, _____

_____

_____

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns in the penal sum of _____

_____

_____

($_____) Dollars, lawful money of the United States for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

_____

_____

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth 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 thereof from the City and to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to commence and to complete all Work as provided herein.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected byany extension of time, modification, omission, addition, or change in or to the said Contract or the Work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any Work to be performed or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal.

IN WITNESS WHEREOF, The Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this

_____ day of _____ 20 _____.

(Seal)

_____ (L.S.)
Principal

(Seal)

By: _____.

Surety

By: _____.
_____.

(Seal) Surety

By: _____.
_____.

(Seal) Surety

By: _____.
_____.

(Seal) Surety

By: _____.
_____.

(Seal) Surety

By: _____.

Bond Premium Rate _____.

Bond Premium Cost _____.

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

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

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

ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION

State of_____ County of_____ ss:

On this_____ day of_____, 20_____ before me personally came_____,
to me known, who, being by me duly sworn did depose and say that he resides at __
_____ ; that he/she is the _____
of the corporation described in and which executed the foregoing instrument; that he/she signed his/her name to the foregoing instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

_____
Notary Public or Commissioner of Deeds.

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.

PAYMENT BOND

Use for any contract for which a Payment Bond is required.

Bond Number 015219935

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, That we, _____

C.D.E. Air Conditioning Co., Inc.

321 39th Street, Brooklyn, NY 11232

hereinafter referred to as the "Principal", and _____

Liberty Mutual Insurance Company

175 Berkeley Street, Boston MA 02116

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

---

Four Million Six Hundred Eighty Two Thousand Eight Hundred Thirteen Dollars and 00/100

($4,682,813.00) Dollars, lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

Project ID: LBC16MPHC

Mapleton Branch Library HVAC Replacement

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns and other Subcontractors to whom Work under this Contract is sublet and his or their successors and assigns shall promptly pay or cause to be paid all lawful claims for

(a) Wages and compensation for labor performed and services rendered by all persons engaged in the prosecution of the Work under said Contract, and any amendment or extension thereof or addition thereto, whether such persons be agents servants or employees of the Principal or any such Subcontractor, including all persons so engaged who perform the work of laborers or mechanics at or in the vicinity of the site of the Project regardless of any contractual relationship between the Principal or such Subcontractors, or his or their successors or assigns, on the one hand and such laborers or mechanics on the other, but not including office employees not regularly stationed at the site of the project; and

(b) Materials and supplies (whether incorporated in the permanent structure or not), as well as teams, fuels, oils, implements or machinery furnished, used or consumed by said Principal or any subcontractor at or in the vicinity of the site of the Project in the prosecution of the Work under said Contract and any amendment or extension thereof or addition thereto; then this obligation shall be void, otherwise to remain infull force and effect.

This bond is subject to the following additional conditions, limitations and agreements:

(a) The Principal and Surety (Sureties) agree that this bond shall be for the benefit of any materialmen or laborer having a just claim, as well as the City itself.

(b) All persons who have performed labor, rendered services or furnished materials and supplies,as aforesaid, shall have a direct right of action against the Principal and his, its or their successors and assigns, and the Surety (Sureties) herein, or against either or both or any of them and their successors and assigns. Such persons may sue in their own name, and may prosecute the suit to judgment and execution without the necessity of joining with any other persons as party plaintiff.

(c) The Principal and Surety (Sureties) agree that neither of them will hold the City liable for any judgment for costs of otherwise, obtained by either or both of them against a laborer or materialman in a suit brought by either a laborer or materialman under this bond for moneys allegedly due for performing work or furnishing material.

(d) The Surety (Sureties) or its successors and assigns shall not be liable for any compensation recoverable by an employee or laborer under the Workmen's Compensation Law.

(e) In no event shall the Surety (Sureties), or its successors or assigns, be liable for a greater sum than the penalty of this bond or be subject to any suit, action or proceeding hereon that is instituted by any person, firm, or corporation hereunder later than two years after the complete performance of said Contract and final settlement thereof.

The Principal, for himself and his successors and assigns, and the Surety (Sureties), for itself and its successors and assigns, do hereby expressly waive any objection that might be interposed as to the rightof the City to require a bond containing the foregoing provisions, and they do hereby further expressly waiveany defense which they or either of them might interpose to an action brought hereon by any person, firm or corporation, including subcontractors, materialmen and third persons, for work, labor, services, supplies or material performed rendered, or furnished as aforesaid upon the ground that there is no law authorizing the City to require the foregoing provisions to be place in this bond.

And the Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties), and its bonds shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or of the said Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any part thereof, or of any Work to be performed, or any moneys due to become due thereunder and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, Subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done or in relation to said Principal.

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their 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 23rd day of August, 2023.

(Seal) C.D.E. Air Conditioning Co., Inc. (L.S.)Principal

By: _____

(Seal) Liberty Mutual Insurance Company Surety

By: _____
Andrea E. Gorbert, Attorney-In-Fact

(Seal) _____ Surety

By: _____

(Seal) _____ Surety

By: _____

(Seal) _____ Surety

By: _____

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

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

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

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of New York County of Kings ss:

On this 24th day of August, 2023, before me personally came Joseph F. Azara to me known, who, being by me duly sworn did depose and say that he resides at Staten Island, New York that he is the President of the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation, and that he signed his name thereto by like order.

PAULA BRAVO
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01BR6367980
Qualified in KINGS County
Commission Expires 12/04/2025

Paula Bravo
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of_____ County of_____ ss:

On this_____day of_____,_____, before me personally appeared _____ to me known, and known to me to be one of the members of the firm of _____ described in and who executed the foregoing instrument; and he acknowledged to me that he executed the same as and for the act and deed of said firm.

_____
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of_____ County of_____ ss:

On this _____ day of_____,_____, before me personally appeared _____ to me known, and known to me to be the person described in and who executed the foregoing instrument; and acknowledged that he executed the same.

_____
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bondis executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * * * * *

Affix Acknowledgments and Justification of Sureties.

ACKNOWLEDGEMENT OF SURETY COMPANY

STATE OF **New York**

COUNTY OF **Nassau**

ON THE 23rd DAY OF August, 2023 BEFORE ME PERSONALLY APPEARED **Andrea E. Gorbert** TO ME KNOWN, WHO BEING BY ME DULY SWORN, DID DEPOSE AND SAY; THAT (S)HE IS THE ATTORNEY-IN-FACT OF **Liberty Mutual Insurance Company** THE CORPORATION THAT EXECUTED THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED TO ME THAT SUCH CORPORATION EXECUTED THE SAME.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIXED MY OFFICIAL SEAL, AT MY OFFICE IN THE ABOVE COUNTY, THE DAY AND YEAR WRITTEN ABOVE.

Notary Public

MARIYA Y LEONIDOV
NOTARY PUBLIC-STATE OF NEW YORK
No. 01LE6387977
Qualified in Nassau County
My Commission Expires 02-25-2027

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

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

Certificate No: **8210512-985164**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Andrea E. Gorbert; Kevin T. Walsh, Jr.; Mariya Leonidov; Michael Marino

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

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 31st day of July, 2023.

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

By: _____
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 31st day of July, 2023 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

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

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

By: _____
Teresa Pastella, Notary Public

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

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts: Section 5. Surety Bonds and Undertakings.
Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

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

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

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

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 23rd day of August, 2023.

By: _____
Renee C. Llewellyn, Assistant Secretary

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

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

LIBERTY MUTUAL INSURANCE COMPANY

Financial Statement – December 31, 2022

Assets

Cash and Bank Deposits	$3,908,755,039
*Bonds — U.S Government	3,451,999,931
*Other Bonds	18,862,255,155
*Stocks	19,372,953,698
Real Estate	190,092,373
Agents' Balances or Uncollected Premiums	7,929,876,358
Accrued Interest and Rents	166,740,412
Other Admitted Assets	15,968,062,977
Total Admitted Assets	**$69,850,735,943**

Liabilities

Unearned Premiums	$10,133,358,204
Reserve for Claims and Claims Expense	27,953,643,316
Funds Held Under Reinsurance Treaties	368,610,620
Reserve for Dividends to Policyholders	1,379,296
Additional Statutory Reserve	197,278,000
Reserve for Commissions, Taxes and Other Liabilities	9,206,000,954
Total	**$47,860,270,390**
Special Surplus Funds	$195,696,103
Capital Stock	10,000,075
Paid in Surplus	13,324,803,036
Unassigned Surplus	8,459,966,339
Surplus to Policyholders	**21,990,465,553**
Total Liabilities and Surplus	**$69,850,735,943**

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

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

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

T A Mikolajewski

Assistant Secretary

LABOR LAW ARTICLE 8 - NYC PUBLIC WORKS

Workers, Laborers and Mechanics employed on a public work project must receive not less than the prevailing rate of wage and benefits for the classification of work performed by each upon such public work. Pursuant to New York Labor Law Article 8 the Comptroller of the City of New York has promulgated this schedule solely for Workers, Laborers and Mechanics engaged by private contractors on New York City public work projects. Prevailing rates are required to be annexed to and form part of the public work contract pursuant to Labor Law section 220 (3).

This schedule is a compilation of separate determinations of the prevailing rate of wage and supplements made by the Comptroller for each trade classification listed herein pursuant to Labor Law section 220 (5). The source of the wage and supplement rates, whether a collective bargaining agreement, survey data or other, is listed at the end of each classification.

Agency Chief Contracting Officers should contact the Bureau of Labor Law's Classification Unit with any questions concerning trade classifications, prevailing rates or prevailing practices with respect to procurement on New York City public work contracts. Contractors are advised to review the Comptroller's Prevailing Wage Schedule before bidding on public work contracts. Contractors with questions concerning trade classifications, prevailing rates or prevailing practices with respect to public work contracts in the procurement stage must contact the contracting agency responsible for the procurement.

Any error as to compensation under the prevailing wage law or other information as to trade classification, made by the contracting agency in the contract documents or in any other communication, will not preclude a finding against the contractor of prevailing wage violation.

Any questions concerning trade classifications, prevailing rates or prevailing practices on New York City public work contracts that have already been awarded may be directed to the Bureau of Labor Law's Classification Unit by calling (212) 669-4443. All callers must have the agency name and contract registration number available when calling with questions on public work contracts. Please direct all other compliance issues to: laborlaw@comptroller.nyc.gov or Bureau of Labor Law, Attn: Paul Brumlik, Office of the Comptroller, 1 Centre Street, Room 651, New York, N.Y. 10007.

Pursuant to Labor Law § 220 (3-a) (a), the appropriate schedule of prevailing wages and benefits must be posted in a prominent and accessible place at all public work sites along with the Construction Poster provided on our web site at comptroller.nyc.gov/wages. In addition, covered employees must be given the appropriate schedule of prevailing wages and benefits along with the Worker Notice provided on our web site at the time the public work project begins, and with the first paycheck to each such employee after July first of each year.

This schedule is applicable to work performed during the effective period, unless otherwise noted. Changes to this schedule are published on our web site comptroller.nyc.gov/wages. Contractors must pay the wages and supplements in effect when the worker, laborer, mechanic performs the work. Preliminary schedules for future one-year periods appear in the City Record on or about June 1 each succeeding year. Final schedules appear on or about July 1 in the City Record and on our web site comptroller.nyc.gov/wages.

Prevailing rates and ratios for apprentices are published in the Construction Apprentice Prevailing Wage Schedule. Pursuant to Labor Law § 220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant, registered with the

New York State Department of Labor, may be paid at the apprentice rates. Apprentices who are not so registered must be paid as journey persons.

New York City public work projects awarded pursuant to a Project Labor Agreement ("PLA") in accordance with Labor Law section 222 may have different labor standards for shift, premium and overtime work. Please refer to the PLA's pre-negotiated labor agreements for wage and benefit rates applicable to work performed outside of the regular workday. More information is available at the Mayor's Office of Contract Services (MOCS) web page at:

https://www1.nyc.gov/site/mocs/legal-forms/project-labor-agreements.page

All the provisions of Labor Law Article 8 remain applicable to PLA work including, but not limited to, the enforcement of prevailing wage requirements by the Comptroller in accordance with the trade classifications in this schedule; however, we will enforce shift, premium, overtime and other non-standard rates as they appear in a project's pre-negotiated labor agreement.

In order to meet their obligation to provide prevailing supplemental benefits to each covered employee, employers must either:

1) **Provide bona fide fringe benefits which cost the employer no less than the prevailing supplemental benefits rate; or**
2) **Supplement the employee's hourly wage by an amount no less than the prevailing supplemental benefits rate; or**
3) **Provide a combination of bona fide fringe benefits and wage supplements which cost the employer no less than the prevailing supplemental benefits rate in total.**

Although prevailing wage laws do not require employers to provide bona fide fringe benefits (as opposed to wage supplements) to their employees, other laws may. For example, the Employee Retirement Income Security Act, 29 U.S.C. § 1001 et seq., the Patient Protection and Affordable Care Act, 42 U.S.C. § 18001 et seq., and the New York City Paid Sick Leave Law, N.Y.C. Admin. Code § 20-911 et seq., require certain employers to provide certain benefits to their employees. Labor agreements to which employers are a party may also require certain benefits. The Comptroller's Office does not enforce these laws or agreements.

Employers must provide prevailing supplemental benefits at the straight time rate for each hour worked unless otherwise noted in the classification.

Paid Holidays, Vacation and Sick Leave when listed must be paid or provided in addition to the prevailing hourly supplemental benefit rate.

For more information, please refer to the Comptroller's Prevailing Wage Law Regulations in Title 44 of the Rules of the City of New York, Chapter 2, available at comptroller.nyc.gov/wages.

Paul Brumlik
Director of Classifications
Bureau of Labor Law

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ASBESTOS HANDLER
SEE HAZARDOUS MATERIAL HANDLER

BLASTER

Blaster

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $57.21
Supplemental Benefit Rate per Hour: $50.43

Blaster - Hydraulic Trac Drill

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $51.35
Supplemental Benefit Rate per Hour: $50.43

Blaster - Wagon: Air Trac: Quarry Bar: Drillrunners

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $50.02
Supplemental Benefit Rate per Hour: $50.43

Blaster - Journeyperson

(Laborer, Chipper/Jackhammer including Walk Behind Self Propelled Hydraulic Asphalt and Concrete Breakers and Hydro (Water) Demolition, Powder Carrier, Hydraulic Chuck Tender, Chuck Tender and Nipper)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $44.00
Supplemental Benefit Rate per Hour: $50.43

Blaster - Magazine Keepers: (Watch Person)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $22.00
Supplemental Benefit Rate per Hour: $50.43

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays
Labor Day
Thanksgiving Day

Shift Rates
When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

BOILERMAKER

Boilermaker

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $64.38
Supplemental Benefit Rate per Hour: $47.35
Supplemental Note: For time and one half overtime - $70.58 For double overtime - $93.80

Overtime Description
For Repair and Maintenance work:
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
For New Construction work:
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day

Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Quadruple time the regular rate for work on the following holiday(s).
Labor Day

Paid Holidays
Good Friday
Day after Thanksgiving
Day before Christmas
Day before New Year's Day

Shift Rates
On jobs requiring two (2) or three (3) shifts, the first shift shall work eight (8) hours at the regular straight-time hourly rate. The second shift shall work eight (8) hours and receive eight hours at the regular straight time hourly rate plus two dollars ($2.00) per hour. The third shift shall work eight (8) hours and receive eight hours at the regular straight time hourly rate plus two dollars and twenty-five cents ($2.25) per hour.

(Local #5)

BRICKLAYER

Bricklayer

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $58.23
Supplemental Benefit Rate per Hour: $37.75

Overtime Description
Time and one half the regular rate after a 7 hour day. If working on a job that is predominately Pointer, Cleaner, Caulker work, then Time and one half the regular rate after an 8 hour day.

Overtime
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day

Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
The second shift wage rate shall be a 15% wage premium with no premium for supplemental benefits. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, eight hours will be paid at straight time rate for seven hours of work.

(Bricklayer District Council)

CARPENTER - BUILDING COMMERCIAL

Building Commercial

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $55.05
Supplemental Benefit Rate per Hour: $47.83

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates

The second shift will receive one hour at the double time rate of pay for the last hour of the shift; eight hours pay for seven hours of work, nine hours pay for eight hours of work. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - HEAVY CONSTRUCTION WORK

(Construction of Engineered Structures and Building Foundations including all form work)

Heavy Construction Work

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $58.16
Supplemental Benefit Rate per Hour: $54.26

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate and the supplemental benefits shall be paid at the straight time rate. When two (2) or more shifts of Carpenters are employed, single time will be paid for each shift.

(Carpenters District Council)

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

Carpenter High Rise A

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $50.78
Supplemental Benefit Rate per Hour: $44.44

Carpenter High Rise B

Carpenter High Rise B worker is excluded from high risk operations such as erection decking, perimeter debris netting, leading edge work, self-climbing form systems, and the installation of cocoon systems unless directly supervised by a Carpenter High Rise A worker.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $40.19
Supplemental Benefit Rate per Hour: $17.75

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates

The second shift wage rate shall be 113% of the straight time hourly wage rate. However, any shift beginning after 5:00 P.M. shall be paid at time and one half the regular hourly rate. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - SIDEWALK SHED, SCAFFOLD AND HOIST

Carpenter - Hod Hoist

(Assisted by Mason Tender)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $53.00
Supplemental Benefit Rate per Hour: $47.65

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

The second shift will receive 112% of the straight time hourly rate. Benefit fund contributions shall be paid at the straight time rate. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - WOOD WATER STORAGE TANK

Tank Mechanic

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $36.42
Supplemental Benefit Rate per Hour: $23.10

Tank Helper

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $28.76
Supplemental Benefit Rate per Hour: $23.10

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays

New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Day after Thanksgiving
1/2 day on Christmas Eve if work is performed in the A.M.
Christmas Day
1/2 day on New Year's Eve if work is performed in the A.M.

Vacation

Employed for one (1) year.....one (1) week vacation (40 hours)
Employed for three (3) years.....two (2) weeks vacation (80 hours)
Employed for more than twenty (20) years.....three (3) weeks vacation (120 hours)

SICK LEAVE:
Two (2) sick days after being employed for twenty (20) years.

(Carpenters District Council)

CEMENT & CONCRETE WORKER

Cement & Concrete Worker

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.28
Supplemental Benefit Rate per Hour: $30.20
Supplemental Note: $34.20 on Saturdays; $38.20 on Sundays & Holidays

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $35.80
Supplemental Benefit Rate per Hour: $22.20
Supplemental Note: $24.20 on Saturdays; $26.20 on Sundays & Holidays

Overtime Description
Time and one half the regular rate after 7 hour day (time and one half the regular rate after an 8 hour day when working with Dockbuilders on pile cap forms and for work below street level to the top of the foundation wall, not to exceed 2 feet or 3 feet above the sidewalk-brick shelf, when working on the foundation and structure.)

Overtime
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day before Christmas Day
1/2 day before New Year's Day

Shift Rates
On shift work extending over a twenty-four hour period, all shifts are paid at straight time.

(Cement & Concrete Workers District Council 16)

CEMENT MASON

Cement Mason

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.77
Supplemental Benefit Rate per Hour: $41.01
Supplemental Note: Supplemental benefit time and one half rate: $71.97; Double time rate: double the base supplemental benefit rate.

Overtime Description
Time and one-half the regular rate after an 8 hour day, double time the regular rate after 10 hours. Time and one-half the regular rate on Saturday, double time the regular rate after 10 hours. Double time the regular rate on Sunday. Four Days a week at Ten (10) hours straight time is allowed.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
Any worker who reports to work on Christmas Eve or New Year's Eve pursuant to his employer's instruction shall be entitled to three (3) hours afternoon pay without working.

Shift Rates
For off shift work, (at times other than the regular 7:00 A.M. to 3:30 P.M. work day) a cement mason shall be paid at the regular hourly rate plus a 25% per hour differential.

(Local #780) (BCA)

CORE DRILLER

Core Driller

Effective Period: 7/1/2022 - 10/17/2022
Wage Rate per Hour: $42.54
Supplemental Benefit Rate per Hour: $30.60

Effective Period: 10/18/2022 - 6/30/2023
Wage Rate per Hour: $43.88
Supplemental Benefit Rate per Hour: $31.35

Core Driller Helper

Effective Period: 7/1/2022 - 10/17/2022
Wage Rate per Hour: $33.47
Supplemental Benefit Rate per Hour: $30.60

Effective Period: 10/18/2022 - 6/30/2023
Wage Rate per Hour: $34.47
Supplemental Benefit Rate per Hour: $31.35

Core Driller Helper(Third year in the industry)

Effective Period: 7/1/2022 - 10/17/2022
Wage Rate per Hour: $30.12
Supplemental Benefit Rate per Hour: $30.60

Effective Period: 10/18/2022 - 6/30/2023
Wage Rate per Hour: $31.02
Supplemental Benefit Rate per Hour: $31.35

Core Driller Helper (Second year in the industry)

Effective Period: 7/1/2022 - 10/17/2022
Wage Rate per Hour: $26.78
Supplemental Benefit Rate per Hour: $30.60

Effective Period: 10/18/2022 - 6/30/2023
Wage Rate per Hour: $27.58
Supplemental Benefit Rate per Hour: $31.35

Core Driller Helper (First year in the industry)

Effective Period: 7/1/2022 - 10/17/2022
Wage Rate per Hour: $23.43
Supplemental Benefit Rate per Hour: $30.60

Effective Period: 10/18/2022 - 6/30/2023
Wage Rate per Hour: $24.13
Supplemental Benefit Rate per Hour: $31.35

Overtime Description
Time and one half the regular rate for work on a holiday plus Holiday pay when worked.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Shift Rates
When two (2) or more shifts are employed, single time shall be paid for each shift, but those employees employed on a shift other than from 8:00 A.M. to 5:00 P.M. shall, in addition, receive two dollars ($2.00) per hour differential for each hour worked. When three (3) shifts are needed, each shift shall work seven and one-half (7 ½) hours paid for eight (8) hours of labor and be permitted one-half (½) hour for mealtime.

(Carpenters District Council)

DERRICKPERSON AND RIGGER

Derrick Person & Rigger

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $57.76
Supplemental Benefit Rate per Hour: $56.24

Derrick Person & Rigger - Site Work

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.20
Supplemental Benefit Rate per Hour: $44.97

Overtime Description
The first two hours of overtime on weekdays and the first seven hours of work on Saturdays are paid at time and one half for wages and supplemental benefits. All additional overtimes is paid at double time for wages and supplemental benefits.

Overtime
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

(Local #197)

DIVER

Diver (Marine)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $73.03
Supplemental Benefit Rate per Hour: $54.26

Diver Tender (Marine)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $52.57
Supplemental Benefit Rate per Hour: $54.26

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day

Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When three shifts are utilized each shift shall work seven and one half-hours (7 1/2 hours) and paid for 8 hours, allowing for one half hour for lunch.

(Carpenters District Council)

DOCKBUILDER - PILE DRIVER

Dockbuilder - Pile Driver

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $58.16
Supplemental Benefit Rate per Hour: $54.26

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates

Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate.

(Carpenters District Council)

DRIVER: TRUCK (TEAMSTER)

Driver - Dump Truck

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $44.17
Supplemental Benefit Rate per Hour: $53.95
Supplemental Note: Over 40 hours worked: at time and one half rate - $24.00; at double time rate - $32.00

Driver - Tractor Trailer

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $47.32
Supplemental Benefit Rate per Hour: $52.40
Supplemental Note: Over 40 hours worked: at time and one half rate - $23.25; at double time rate - $31.00

Driver - Euclid & Turnapull Operator

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $47.88
Supplemental Benefit Rate per Hour: $52.40
Supplemental Note: Over 40 hours worked: at time and one half rate - $23.25; at double time rate - $31.00

Overtime Description
For Paid Holidays: Holiday pay for all holidays shall be prorated based two hours per day for each day worked in the holiday week, not to exceed 8 hours of holiday pay. For Thanksgiving week, the prorated share shall be 5 1/3 hours of holiday pay for each day worked in Thanksgiving week.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day

Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

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

Driver Redi-Mix (Sand & Gravel)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $40.89
Supplemental Benefit Rate per Hour: $47.85
Supplemental Note: Over 40 hours worked: time and one half rate $18.68; double time rate $24.90

Overtime Description

For Paid Holidays: Employees who do not work on a contractual holiday shall be compensated two (2) hours extra pay in straight time wages and benefits for every day on which the Employee does not pass up a day's work during the calendar week (Sunday through Saturday) of the holiday, up to a maximum of ten (10) hours in wages and eight (8) hours in benefit contributions for the holiday

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
President's Day
Columbus Day
Veteran's Day

Triple time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day

Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Christmas Day

(Local #282)

ELECTRICIAN

(Including installation of low voltage cabling carrying data, video and/or voice on building construction/alteration/renovation projects.)

Electrician "A" (Regular Day / Day Shift)

Effective Period: 7/1/2022 - 4/12/2023
Wage Rate per Hour: $59.00
Supplemental Benefit Rate per Hour: $57.84
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/13/2023 - 6/30/2023
Wage Rate per Hour: $61.00
Supplemental Benefit Rate per Hour: $60.06
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Regular Day Overtime after 7 hrs / Day Shift Overtime after 8 hrs)

Effective Period: 7/1/2022 - 4/12/2023
Wage Rate per Hour: $88.50
Supplemental Benefit Rate per Hour: $59.74
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/13/2023 - 6/30/2023
Wage Rate per Hour: $91.50
Supplemental Benefit Rate per Hour: $62.02
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Swing Shift)

Effective Period: 7/1/2022 - 4/12/2023
Wage Rate per Hour: $69.23
Supplemental Benefit Rate per Hour: $65.68
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/13/2023 - 6/30/2023
Wage Rate per Hour: $71.57
Supplemental Benefit Rate per Hour: $68.14
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

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

Effective Period: 7/1/2022 - 4/12/2023
Wage Rate per Hour: $103.85
Supplemental Benefit Rate per Hour: $67.90
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/13/2023 - 6/30/2023
Wage Rate per Hour: $107.36
Supplemental Benefit Rate per Hour: $70.45
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Graveyard Shift)

Effective Period: 7/1/2022 - 4/12/2023
Wage Rate per Hour: $77.54
Supplemental Benefit Rate per Hour: $72.31
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/13/2023 - 6/30/2023
Wage Rate per Hour: $80.17
Supplemental Benefit Rate per Hour: $74.99
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

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

Effective Period: 7/1/2022 - 4/12/2023
Wage Rate per Hour: $116.31
Supplemental Benefit Rate per Hour: $74.80

Effective Period: 4/13/2023 - 6/30/2023
Wage Rate per Hour: $120.26
Supplemental Benefit Rate per Hour: $77.57
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

*** Supplemental Benefit Rate per Hour Note**
In addition to the Supplemental Benefit Rates per Hour listed above, the employer must provide an additional 6.2% of taxable gross pay earned on covered work only. This additional Supplemental Benefit Rate will terminate

when the employee has contributed the maximum annual Social Security tax required by law, on all work performed.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on a holiday.
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
For multiple shifts of temporary light and/or power, the temporary light and/or power employee shall be paid for 8 hours at the straight time rate. For three or less workers performing 8 hours temporary light and/or power the supplemental benefit rate is $24.36, effective 04/13/2023 the supplemental benefit rate is $24.78 - See * Supplemental Benefit Rate per Hour Note above.

Electrician "M" (First 8 hours)

"M" rated work shall be defined as jobbing: electrical work of limited duration and scope, also consisting of repairs and/or replacement of electrical and tele-data equipment. Includes all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls and washing and cleaning of foregoing fixtures.

Effective Period: 7/1/2022 - 4/12/2023
Wage Rate per Hour: $31.25
Supplemental Benefit Rate per Hour: $25.30
First and Second Year "M" Wage Rate Per Hour: $26.75
First and Second Year "M" Supplemental Rate: $22.88

Effective Period: 4/13/2023 - 6/30/2023
Wage Rate per Hour: $31.25
Supplemental Benefit Rate per Hour: $26.55
First and Second Year "M" Wage Rate Per Hour: $26.75
First and Second Year "M" Supplemental Rate: $24.13

Electrician "M" (Overtime After First 8 hours)

"M" rated work shall be defined as jobbing: electrical work of limited duration and scope, also consisting of repairs and/or replacement of electrical and tele-data equipment. Includes all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls and washing and cleaning of foregoing fixtures.

Effective Period: 7/1/2022 - 4/12/2023
Wage Rate per Hour: $46.88
Supplemental Benefit Rate per Hour: $27.28
First and Second Year "M" Wage Rate Per Hour: $40.13
First and Second Year "M" Supplemental Rate: $24.57

Effective Period: 4/13/2023 - 6/30/2023
Wage Rate per Hour: $46.88
Supplemental Benefit Rate per Hour: $28.53
First and Second Year "M" Wage Rate Per Hour: $40.13
First and Second Year "M" Supplemental Rate: $25.82

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #3)

ELECTRICIAN - ALARM TECHNICIAN

(Scope of Work - Inspect, test, repair, and replace defective, malfunctioning, or broken devices, components and controls of Fire, Burglar and Security Systems)

Alarm Technician

Effective Period: 7/1/2022 - 3/8/2023
Wage Rate per Hour: $35.40
Supplemental Benefit Rate per Hour: $19.79
Supplemental Note: $17.91 only after 8 hours worked in a day

Effective Period: 3/9/2023 - 6/30/2023
Wage Rate per Hour: $36.40
Supplemental Benefit Rate per Hour: $20.67
Supplemental Note: $18.80 only after 8 hours worked in a day

Overtime Description

Time and one half the regular rate for work on the following holidays: Columbus Day, Veterans Day, Day after Thanksgiving.
Double time the regular rate for work on the following holidays: New Year's day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Night Differential is based upon a ten percent (10%) differential between the hours of 4:00 P.M. and 12:30 A.M. and a fifteen percent (15%) differential for the hours 12:00 A.M. to 8:30 A.M.

Vacation

At least 1 year of employment.....ten (10) days
5 years or more of employment.....fifteen (15) days
10 years of employment.....twenty (20) days

Plus one Personal Day per year

Sick Days:
One day per Year. Up to 4 vacation days may be used as sick days.

(Local #3)

ELECTRICIAN-STREET LIGHTING WORKER

Electrician - Electro Pole Electrician

Effective Period: 7/1/2022 - 4/19/2023
Wage Rate per Hour: $59.00
Supplemental Benefit Rate per Hour: $59.85

Effective Period: 4/20/2023 - 6/30/2023
Wage Rate per Hour: $61.00
Supplemental Benefit Rate per Hour: $62.13
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician - Electro Pole Foundation Installer

Effective Period: 7/1/2022 - 4/18/2023
Wage Rate per Hour: $44.66
Supplemental Benefit Rate per Hour: $45.27

Effective Period: 4/20/2023 - 6/30/2023
Wage Rate per Hour: $46.66
Supplemental Benefit Rate per Hour: $47.16
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician - Electro Pole Maintainer

Effective Period: 7/1/2022 - 4/18/2023
Wage Rate per Hour: $38.61
Supplemental Benefit Rate per Hour: $41.00

Effective Period: 4/20/2023 - 6/30/2023
Wage Rate per Hour: $40.61
Supplemental Benefit Rate per Hour: $42.88
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

*** Supplemental Benefit Rate per Hour Note**
In addition to the Supplemental Benefit Rates per Hour listed above, the employer must provide an additional 6.2% of taxable gross pay earned on covered work only. This additional Supplemental Benefit Rate will terminate when the employee has contributed the maximum annual Social Security tax required by law, on all work performed.

Overtime Description

Electrician - Electro Pole Electrician: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week.
Electrician - Electro Pole Foundation Installer: Time and one half the regular rate after 8 hours within a 24 hour period and Saturday and Sunday.
Electrician - Electro Pole Maintainer: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week. Saturdays and Sundays may be used as a make-up day at straight time when a day is lost during the week to inclement weather.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

(Local #3)

ELEVATOR CONSTRUCTOR

Elevator Constructor

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate per Hour: $75.14
Supplemental Benefit Rate per Hour: $39.11

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate per Hour: $77.49
Supplemental Benefit Rate per Hour: $40.62

Overtime Description

For New Construction: work performed after an 8 hour day, Saturday, Sunday or between 4:30pm and 7:00am shall be paid at double time rate.

Existing buildings: work performed after an 8 hour day, Saturday, Sunday or between 5:30pm and 7:00 am shall be paid time and one half.

Overtime
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Vacation
Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

Elevator Service/Modernization Mechanic

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate per Hour: $59.09
Supplemental Benefit Rate per Hour: $39.01

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate per Hour: $60.89
Supplemental Benefit Rate per Hour: $40.52

Overtime Description
For Scheduled Service Work: Double time - work scheduled in advance by two or more workers performed on Sundays, Holidays, and between midnight and 7:00am.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays

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: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $74.86
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $119.78

Engineer - Heavy Construction Operating Engineer II

Backhoes, Basin Machines, Groover, Mechanical Sweepers, Bobcat, Boom Truck, Barrier Transport (Barrier Mover) & machines of similar nature. Operation of Churn Drills and machines of a similar nature, Stetco Silent Hoist and machines of similar nature, Vac-Alls, Meyers Machines, John Beam and machines of a similar nature, Ross Carriers and Travel Lifts and machines of a similar nature, Bulldozers, Scrapers and Turn-a-Pulls: Tugger Hoists (Used exclusively for handling excavated material); Tractors with attachments, Hyster and Roustabout Cranes, 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 man auger.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $72.55
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $116.08

Engineer - Heavy Construction Operating Engineer III

Minor Equipment such as Tractors, Post Hole Diggers, Ditch Witch (Walk Behind), Road Finishing Machines, Rollers five tons and under, Tugger Hoists, Dual Purpose Trucks, Fork Lifts, and Dempsey Dumpers, Fireperson.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $68.68
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $109.89

Engineer - Heavy Construction Maintenance Engineer I

Installing, Repairing, Maintaining, Dismantling and Manning of all equipment including Steel Cutting, Bending and Heat Sealing Machines, Mechanical Heaters, Grout Pumps, Bentonite Pumps & Plants, Screening Machines, Fusion Coupling Machines, Tunnel Boring Machines Moles and Machines of a similar nature, Power Packs, Mechanical Hydraulic Jacks; all drill rigs including but not limited to Churn, Rotary Caisson, Raised Bore & Drills of a similar nature; Personnel, Inspection & Safety Boats or any boats used to perform functions of same, Mine Hoists, Whirlies, all Climbing Cranes, all Tower Cranes, including but not limited to Truck Mounted and Crawler Type and machines of similar nature; Maintaining Hydraulic Drills and machines of a similar nature; Well Point System-Installation and dismantling; Burning, Welding, all Pumps regardless of size and/or motor power, except River Cofferdam Pumps and Wells Point Pumps; Motorized Buggies (three or more); equipment used in the cleaning and televising of sewers, but not limited to jet-rodder/vacuum truck, vacall/vactor, closed circuit television inspection equipment; high powered water pumps, jet pumps; screed machines and concrete finishing machines of a similar nature; vermeers.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $72.19
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $115.50

Engineer - Heavy Construction Maintenance Engineer II

On Base Mounted Tower Cranes

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $95.74
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $153.18

Engineer - Heavy Construction Maintenance Engineer III

On Generators, Light Towers

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.62
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $74.59

Engineer - Heavy Construction Maintenance Engineer IV

On Pumps and Mixers including mud sucking

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $47.90
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $76.64

Engineer - Heavy Construction Service Engineer

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $64.78
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $103.65

Engineer - Heavy Construction Service Mechanic

Shovels: Cranes: Draglines: Backhoes: Keystones: Pavers: Trenching Machines: 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: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $43.90
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $70.24

Engineer - Steel Erection Maintenance Engineers

Derrick, Travelers, Tower, Crawler Tower and Climbing Cranes

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $69.19
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime

Shift Wage Rate: $110.70

Engineer - Steel Erection Oiler I

On a Truck Crane

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $64.57
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $103.31

Engineer - Steel Erection Oiler II

On a Crawler Crane

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $48.44
Supplemental Benefit Rate per Hour: $44.72
Supplemental Note: $82.04 on overtime
Shift Wage Rate: $77.50

Overtime Description
On jobs of more than one shift, if the next shift employee fails to report for work through any cause over which the employer has no control, the employee on duty who works the next shift continues to work at the single time rate.

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

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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: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $64.47
Supplemental Benefit Rate per Hour: $43.81
Supplemental Note: $80.22 on overtime

Engineer - Building Work Maintenance Engineers II

On Pumps, Generators, Mixers and Heaters

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $49.42
Supplemental Benefit Rate per Hour: $43.81
Supplemental Note: $80.22 on overtime

Engineer - Building Work Oilers I

All gasoline, electric, diesel or air operated Gradealls: Concrete Pumps, Overhead Cranes in Power Houses: Their duties shall be to assist the Engineer in oiling, greasing and repairing of all machines; Driving Truck Cranes: Driving and Operating Fuel and Grease Trucks, Cherrypickers (hydraulic cranes) over 70,000 GVW, and machines of a similar nature.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $61.15
Supplemental Benefit Rate per Hour: $43.81
Supplemental Note: $80.22 on overtime

Engineer - Building Work Oilers II

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $44.68
Supplemental Benefit Rate per Hour: $43.81
Supplemental Note: $80.22 on overtime

Overtime Description

On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

Shift Rates

When two (2) or more shifts are employed, single time will be paid for each shift.

(Local #15)

ENGINEER - CITY SURVEYOR AND CONSULTANT

Party Chief

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $42.49
Supplemental Benefit Rate per Hour: $25.50
Supplemental Note: Overtime Benefit Rate - $30.50 per hour (time & one half) $35.50 per hour (double time).

Instrument Person

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $34.64
Supplemental Benefit Rate per Hour: $25.50
Supplemental Note: Overtime Benefit Rate - $30.50 per hour (time & one half) $35.50 per hour (double time).

Rodperson

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $29.69
Supplemental Benefit Rate per Hour: $25.50
Supplemental Note: Overtime Benefit Rate - $30.50 per hour (time & one half) $35.50 per hour (double time).

Overtime Description

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (BUILDING CONSTRUCTION)

(Construction of Building Projects, Concrete Superstructures, etc.)

Field Engineer - BC Party Chief

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $66.46
Supplemental Benefit Rate per Hour: $40.09
Supplemental Note: Overtime Benefit Rate - $56.54 per hour (time & one half) $72.98 per hour (double time).

Field Engineer - BC Instrument Person

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $50.97
Supplemental Benefit Rate per Hour: $40.09
Supplemental Note: Overtime Benefit Rate - $56.54 per hour (time & one half) $72.98 per hour (double time).

Field Engineer - BC Rodperson

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $31.90
Supplemental Benefit Rate per Hour: $40.09
Supplemental Note: Overtime Benefit Rate - $56.54 per hour (time & one half) $72.98 per hour (double time).

Overtime Description

Time and one half the regular rate after a 7 hour work and time and one half the regular rate for Saturday for the first seven hours worked, Double time the regular time rate for Saturday for work performed in excess of seven hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (HEAVY CONSTRUCTION)

(Construction of Roads, Tunnels, Bridges, Sewers, Building Foundations, Engineering Structures etc.)

Field Engineer - HC Party Chief

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $77.31
Supplemental Benefit Rate per Hour: $42.52
Supplemental Note: Overtime benefit rate - $60.06 per hour (time & one half), $77.60 per hour (double time).

Field Engineer - HC Instrument Person

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $55.97
Supplemental Benefit Rate per Hour: $42.52
Supplemental Note: Overtime benefit rate - $60.06 per hour (time & one half), $77.60 per hour (double time).

Field Engineer - HC Rodperson

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.47
Supplemental Benefit Rate per Hour: $42.52
Supplemental Note: Overtime benefit rate - $60.06 per hour (time & one half), $77.60 per hour (double time).

Overtime Description

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (STEEL ERECTION)

Field Engineer - Steel Erection Party Chief

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $71.98
Supplemental Benefit Rate per Hour: $42.07
Supplemental Note: Overtime benefit rate - $59.38 per hour (time & one half), $76.69 per hour (double time).

Field Engineer - Steel Erection Instrument Person

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $55.42
Supplemental Benefit Rate per Hour: $42.07
Supplemental Note: Overtime benefit rate - $59.38 per hour (time & one half), $76.69 per hour (double time).

Field Engineer - Steel Erection Rodperson

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $36.05
Supplemental Benefit Rate per Hour: $42.07
Supplemental Note: Overtime benefit rate - $59.38 per hour (time & one half), $76.69 per hour (double time).

Overtime Description

Time and one half the regular rate for Saturday for the first eight hours worked.
Double time the regular rate for Saturday for work performed in excess of eight hours.

Overtime

Time and one half the regular rate after an 8 hour day.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - OPERATING

Operating Engineer - Road & Heavy Construction I

Back Filling Machines, Cranes, Mucking Machines and Dual Drum Paver.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $88.32
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $141.31

Operating Engineer - Road & Heavy Construction II

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $91.40
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $146.24

Operating Engineer - Road & Heavy Construction III

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $94.31
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $150.90

Operating Engineer - Road & Heavy Construction IV

Gradealls, Keystones, Cranes on land or water (with digging buckets), Bridge Cranes, Vermeer Cutter and machines of a similar nature, Trenching Machines.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $92.06
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $147.30

Operating Engineer - Road & Heavy Construction V

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $90.26
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $144.42

Operating Engineer - Road & Heavy Construction VI

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

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

Operating Engineer - Road & Heavy Construction VII

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $69.52
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $111.23

Operating Engineer - Road & Heavy Construction VIII

Utility Compressors

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $54.21
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $68.04

Operating Engineer - Road & Heavy Construction IX

Horizontal Boring Rig

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $81.67
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $130.67

Operating Engineer - Road & Heavy Construction X

Elevators (manually operated as personnel hoist).

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $75.16
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $120.26

Operating Engineer - Road & Heavy Construction XI

Compressors (Portable 3 or more in battery), Driving of Truck Mounted Compressors, Well-point Pumps, Tugger Machines Well Point Pumps, Churn Drill.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $58.61
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $93.78

Operating Engineer - Road & Heavy Construction XII

All Drills and Machines of a similar nature.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $86.71
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $138.74

Operating Engineer - Road & Heavy Construction XIII

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $84.02
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $134.43

Operating Engineer - Road & Heavy Construction XIV

Concrete Mixer

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $80.36
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $128.58

Operating Engineer - Road & Heavy Construction XV

Compressors (Portable Single or two in Battery, not over 100 feet apart), Pumps (River Cofferdam) and Welding Machines, Push Button Machines, All Engines Irrespective of Power (Power-Pac) used to drive auxiliary equipment, Air, Hydraulic, etc.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $54.56
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $87.30

Operating Engineer - Road & Heavy Construction XVI

Concrete Breaking Machines, Hoists (Single Drum), Load Masters, Locomotives (over ten tons) and Dinkies over ten tons, Hydraulic Crane-Second Engineer.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $76.80
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $122.88

Operating Engineer - Road & Heavy Construction XVII

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $77.36
Supplemental Benefit Rate per Hour: $35.30

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

Operating Engineer - Road & Heavy Construction XVIII

Tower Crane

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

Operating Engineer - Paving I

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

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

Operating Engineer - Paving II

Asphalt Roller

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

Operating Engineer - Paving III

Asphalt Plants

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

Operating Engineer - Concrete I

Cranes

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

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

Operating Engineer - Concrete II

Compressors

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

Operating Engineer - Concrete III

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

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

Operating Engineer - Steel Erection I

Three Drum Derricks

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

Operating Engineer - Steel Erection II

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

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

Operating Engineer - Steel Erection III

Compressors, Welding Machines.

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

Operating Engineer - Steel Erection IV

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $52.10
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
Shift Wage Rate: $83.36

Operating Engineer - Building Work I

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $73.28
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours

Operating Engineer - Building Work II

Compressors, Welding Machines (Cutting Concrete-Tank Work), Paint Spraying, Sandblasting, Pumps (with the exclusion of Concrete Pumps), All Engines irrespective of Power (Power-Pac) used to drive Auxiliary Equipment, Air, Hydraulic, Jacking System, etc.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $54.94
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours

Operating Engineer - Building Work III

Double Drum

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $86.78
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours

Operating Engineer - Building Work IV

Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $91.86
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours

Operating Engineer - Building Work V

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $81.38
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours

Operating Engineer - Building Work VI

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $80.52
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours

Operating Engineer - Building Work VII

Rack & Pinion and House Cars

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $64.09
Supplemental Benefit Rate per Hour: $35.30
Supplemental Note: $64.40 overtime hours
For New House Car projects Wage Rate per Hour $51.21
For New House Car projects: Supplemental Benefit overtime hours: $49.85

Overtime Description

On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

For House Cars and Rack & Pinion only: Overtime paid at time and one-half for all hours in excess of eight hours in a day, Saturday, Sunday and Holidays worked.

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day

Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

Shift Rates

When two (2) or more shifts are employed, single time will be paid for each shift.
For Steel Erection Only: Shifts may be worked at the single time rate at other than the regular working hours (8:00 A.M. to 4:30 P.M.) on the following work ONLY: Heavy construction jobs on work below the street level, over railroad tracks and on building jobs.

(Operating Engineer Local #14)

FLOOR COVERER

(Interior vinyl composition tile, sheath vinyl linoleum and wood parquet tile including site preparation and synthetic turf not including site preparation)

Floor Coverer

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $55.05
Supplemental Benefit Rate per Hour: $47.83

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Day before Christmas
Christmas Day
Day before New Year's Day

Shift Rates

Two shifts may be utilized with the first shift working 8 a.m. to the end of the shift at straight time rate of pay. The wage rate for the second shift consisting of 7 hours shall be paid at 114.29% of straight time wage rate. The wage rate for the second shift consisting of 8 hours shall be paid 112.5% of the straight time wage rate. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

GLAZIER
(New Construction, Remodeling, and Alteration)

Glazier

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.55
Supplemental Benefit Rate per Hour: $50.04
Supplemental Note: Supplemental Benefit Overtime Rate: $75.07

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

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

(Local #1281)

GLAZIER - REPAIR & MAINTENANCE

(For the Installation of Glass - All repair and maintenance work on a particular building.)

Craft Jurisdiction for repair, maintenance and fabrication

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

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $26.40
Supplemental Benefit Rate per Hour: $25.32

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Local #1281)

HAZARDOUS MATERIAL HANDLER

(Removal, abatement, encapsulation or decontamination of asbestos, lead, mold, or other toxic or hazardous waste/materials)

Handler

Effective Period: 7/1/2022 - 7/3/2022
Wage Rate per Hour: $38.05

Supplemental Benefit Rate per Hour: $19.10

Effective Period: 7/4/2022 - 6/30/2023
Wage Rate per Hour: $38.05
Supplemental Benefit Rate per Hour: $19.60

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Sunday.
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day
Easter

Paid Holidays
None

(Local #78 and Local #12A)

HEAT AND FROST INSULATOR

Heat & Frost Insulator

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $62.71
Supplemental Benefit Rate per Hour: $41.91

Overtime Description
Double time shall be paid for supplemental benefits during overtime work.
8th hour paid at time and one half.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Triple time the regular rate for work on the following holiday(s).
Labor Day

Paid Holidays
None

Shift Rates
The first shift shall work seven hours at the regular straight time rate. The second and third shift shall work seven hours the regular straight time hourly rate plus a fourteen percent wage and benefit premium.There must be a first shift to work the second shift, and a second shift to work the third shift. Off-hour jobs in occupied buildings may be worked on weekdays with an increment of one-dollar ($1.00) per hour and eight (8) hours pay for seven (7) hours worked.

(Local #12) (BCA)

HOUSE WRECKER
(TOTAL DEMOLITION)

House Wrecker - Tier A

On all work sites the first, second, eleventh and every third House Wrecker thereafter will be Tier A House Wreckers (i.e. 1st, 2nd, 11th, 14th etc). Other House Wreckers may be Tier B House Wreckers.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $38.23
Supplemental Benefit Rate per Hour: $30.97

House Wrecker - Tier B

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $27.46
Supplemental Benefit Rate per Hour: $23.38

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL

Iron Worker - Ornamental

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.65
Supplemental Benefit Rate per Hour: $61.62
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description
Time and one half the regular rate after a 7 hour day for a maximum of two hours on any regular work day (the 8th and 9th hour) and double time shall be paid for all work on a regular work day thereafter, time and one half the regular rate for Saturday for the first seven hours of work and double time shall be paid for all work on a Saturday thereafter.

Overtime
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When two or three shifts are employed on a job, Monday through Friday, the second and third shift are paid eight and one half (8 ½) hours at the straight time rate for seven (7) hours of work, and ten (10) hours at the straight time rate for eight (8) hours of work. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, eight hours will be paid at straight time rate for seven hours of work, and all overtime shall be paid at time and one-half the regular straight time rates but on Sundays and Holidays, time and one-half the regular straight time rate shall be paid for all work up to seven (7) hours and double time shall be paid for all work thereafter.

(Local #580)

IRON WORKER - STRUCTURAL

Iron Worker - Structural

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $55.70
Supplemental Benefit Rate per Hour: $84.79
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description
Monday through Friday- the first eight hours are paid at straight time, the 9th and 10th hours are paid at time and one-half the regular rate, all additional weekday overtime is paid at double the regular rate. Saturdays- the first eight hours are paid at time and one-half the regular rate, double time thereafter. Sunday-all shifts are paid at double time. Four Days a week at Ten (10) hours straight time is allowed.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates
Monday through Friday - First Shift: First eight hours are paid at straight time, the 9th & 10th hours are paid at time and a half, double time paid thereafter. Second and third Shifts: First eight hours are paid at time and one-half, double time thereafter. Saturdays: All shifts, first eight hours paid at time and one-half, double time thereafter: Sunday all shifts are paid at double time.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday.

(Local #40 & #361)

LABORER
(Foundation, Concrete, Excavating, Street Pipe Layer and Common)

Laborer

Excavation and foundation work for buildings, heavy construction, engineering work, and hazardous waste removal in connection with the above work. Landscaping tasks in connection with heavy construction work, engineering work and building projects. Projects include, but are not limited to pollution plants, sewers, parks, subways, bridges, highways, etc.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $44.00
Supplemental Benefit Rate per Hour: $50.43

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays
Labor Day

Thanksgiving Day

Shift Rates

When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

LANDSCAPING

(Landscaping tasks, such as tree pruning, tree removing and spraying in connection with Green Infrastructure maintenance and the planting of street trees and trees in City parks, but not when such activities are performed as part of construction or reconstruction projects.)

Landscaper (Year 6 and above)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $35.06
Supplemental Benefit Rate per Hour: $17.55

Landscaper (Year 3 - 5)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $33.93
Supplemental Benefit Rate per Hour: $17.55

Landscaper (up to 3 years)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $31.09
Supplemental Benefit Rate per Hour: $17.55

Groundperson

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $31.09
Supplemental Benefit Rate per Hour: $17.55

Tree Remover / Pruner

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

Wage Rate per Hour: **$40.76**
Supplemental Benefit Rate per Hour: **$17.55**

Landscaper Sprayer (Pesticide Applicator)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **$29.39**
Supplemental Benefit Rate per Hour: **$17.55**

Watering - Plant Maintainer

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **$23.68**
Supplemental Benefit Rate per Hour: **$17.55**

Overtime Description
For all overtime work performed, supplemental benefits shall include an additional seventy-five ($0.75) cents per hour.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Shift Rates
Work performed on a 4pm to 12am shift has a 15% differential. Work performed on a 12am to 8am shift has a 20% differential.

(Local #175)

MARBLE MECHANIC

Marble Setter

Effective Period: 7/1/2022 - 7/3/2022
Wage Rate per Hour: **$57.17**

Supplemental Benefit Rate per Hour: $42.26

Effective Period: 7/4/2022 - 6/30/2023
Wage Rate per Hour: $57.40
Supplemental Benefit Rate per Hour: $42.66

Marble Finisher

Effective Period: 7/1/2022 - 7/3/2022
Wage Rate per Hour: $44.42
Supplemental Benefit Rate per Hour: $39.46

Effective Period: 7/4/2022 - 6/30/2023
Wage Rate per Hour: $44.65
Supplemental Benefit Rate per Hour: $39.76

Marble Polisher

Effective Period: 7/1/2022 - 7/3/2022
Wage Rate per Hour: $43.35
Supplemental Benefit Rate per Hour: $32.26

Effective Period: 7/4/2022 - 6/30/2023
Wage Rate per Hour: $43.71
Supplemental Benefit Rate per Hour: $32.46

Marble Maintenance Finisher

Effective Period: 7/1/2022 - 7/3/2022
Wage Rate per Hour: $27.01
Supplemental Benefit Rate per Hour: $13.99

Effective Period: 7/4/2022 - 6/30/2023
Wage Rate per Hour: $27.17
Supplemental Benefit Rate per Hour: $14.23

Overtime Description
Supplemental Benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday

Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #7)

MASON TENDER

Mason Tender

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $39.95
Supplemental Benefit Rate per Hour: $31.99

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
The employer may work two (2) shifts with the first shift at the straight time wage rate and the second shift receiving eight (8) hours paid for seven (7) hours work at the straight time wage rate. When it is not possible to conduct alteration work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Local #79)

MASON TENDER (INTERIOR DEMOLITION WORKER)

Mason Tender Tier A

Tier A Interior Demolition Worker performs all burning, chopping, and other technically skilled tasks related to interior demolition work.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $37.69
Supplemental Benefit Rate per Hour: $26.10

Mason Tender Tier B

Tier B Interior Demolition Worker performs manual work and work incidental to demolition work, such as loading and carting of debris from the work site to an area where it can be loaded in to bins/trucks for removal. Also performs clean-up of the site when demolition is completed.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $26.88
Supplemental Benefit Rate per Hour: $20.42

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Local #79)

METALLIC LATHER

Metallic Lather

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.40
Supplemental Benefit Rate per Hour: $51.30
Supplemental Note: For time and one half overtime - $63.05 For double overtime - $79.10

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates
Off-shift work outside of normal working hours shall receive straight time rate plus $12 per hour for the first eight (8) hours.

(Local #46)

MILLWRIGHT

Millwright

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $57.80
Supplemental Benefit Rate per Hour: $55.96

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

Second and third shifts receives the straight time rate of pay plus fifteen (15%) percent allowing for one half hour for a meal. There must be a first shift to work a second and third shift. All additional hours worked shall be paid at the time and one-half rate of pay plus fifteen (15%) percent for weekday hours.

(Local #740)

MOSAIC MECHANIC

Mosaic Mechanic - Mosaic & Terrazzo Mechanic

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $52.75
Supplemental Benefit Rate per Hour: $44.37

Mosaic Mechanic - Mosaic & Terrazzo Finisher

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $51.14
Supplemental Benefit Rate per Hour: $44.37

Mosaic Mechanic - Machine Operator Grinder

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $51.14
Supplemental Benefit Rate per Hour: $44.37

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Good Friday
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #7)

PAINTER

Painter - Brush & Roller

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $43.00
Supplemental Benefit Rate per Hour: $38.78
Supplemental Note: $46.62 on overtime

Spray & Scaffold / Decorative / Sandblast

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.00
Supplemental Benefit Rate per Hour: $38.78
Supplemental Note: $46.62 on overtime

Overtime
Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(District Council of Painters #9)

PAINTER - LINE STRIPING (ROADWAY)

Striping - Machine Operator

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $39.00
Supplemental Benefit Rate per Hour: $15.27
Supplemental Note: Overtime Supplemental Benefit rate - $15.90

Lineperson (Thermoplastic)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $43.00
Supplemental Benefit Rate per Hour: $15.27
Supplemental Note: Overtime Supplemental Benefit rate - $15.90

Striping Assistant & Traffic Safety

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $37.00
Supplemental Benefit Rate per Hour: $15.27
Supplemental Note: Overtime Supplemental Benefit rate - $15.90

Overtime Description
For Paid Holidays: Employees will only receive Holiday Pay for holidays not worked if said employee worked both the regularly scheduled workday before and after the holiday.

Overtime

Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Vacation

Employees with one to two years service shall accrue vacation based on hours worked: 250 hours worked - 1 day vacation; 500 hours worked - 2 days vacation; 750 hours worked - 3 days vacation; 900 hours worked - 4 days vacation; 1,000 hours worked - 5 days vacation. Employees with two to five years service receive two weeks vacation. Employees with five to twenty years service receive three weeks vacation. Employees with twenty to twenty-five years service receive four weeks vacation. Employees with 25 or more years service receive five weeks vacation.

(Local #1010)

PAINTER - METAL POLISHER

METAL POLISHER

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $32.51
Supplemental Benefit Rate per Hour: $10.92

METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $33.46
Supplemental Benefit Rate per Hour: $10.92

METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $36.01
Supplemental Benefit Rate per Hour: $10.92

ASSISTANT METAL POLISHER

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $25.31
Supplemental Benefit Rate per Hour: $10.44

ASSISTANT METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $26.26
Supplemental Benefit Rate per Hour: $10.44

ASSISTANT METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $27.81
Supplemental Benefit Rate per Hour: $10.44

Overtime Description
All work performed on Saturdays shall be paid at time-in-a half. The exception being; for suspended scaffold work and work deemed as a construction project; an eight (8) hour shift lost during the week due to circumstances beyond the control of the employer, up to a maximum of eight (8) hours per week, may be worked on Saturday at the straight time rate.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.
Triple time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Four Days a week at Ten (10) hours straight a day.

Local 8A-28A

PAINTER - SIGN

Sign Painter

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $45.54
Supplemental Benefit Rate per Hour: $22.29

Assistant Sign Painter

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $38.70
Supplemental Benefit Rate per Hour: $20.20

Overtime Description
If any employee is required to work on any of the paid holidays then the employee shall receive double time rate of wages as well as the holiday pay for that day.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Paid Holidays
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Vacation
At least 1 year of employment.....1 week
2 years or more of employment.....2 weeks
8 years or more of employment.....3 weeks

(Local #8A-28A)

PAINTER - STRUCTURAL STEEL

Painters on Structural Steel

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $53.00
Supplemental Benefit Rate per Hour: $49.83

Painter - Power Tool

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $59.50
Supplemental Benefit Rate per Hour: $49.83
Overtime Wage Rate: $6.50 above the "Painters on Structural Steel" overtime rate.

Overtime Description
Supplemental Benefits shall be paid for each hour worked, up to forty (40) hours per week for the period of May 1st to November 15th or up to fifty (50) hours per week for the period of November 16th to April 30th.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Second shift is paid at regular hourly wage rates plus a ten percent (10%) differential. There must be a first shift in order to work a second shift.

(Local #806)

PAPERHANGER

Paperhanger

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $47.37

Supplemental Benefit Rate per Hour: $39.06
Supplemental Note: Supplemental benefits are to be paid at the appropriate straight time and overtime rate.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Evening shift - 4:30 P.M. to 12:00 Midnight (regular rate of pay); any work performed before 7:00 A.M. shall be at time and one half the regular base rate of pay.

(District Council of Painters #9)

PAVER AND ROADBUILDER

Paver & Roadbuilder - Formsetter

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $48.35
Supplemental Benefit Rate per Hour: $50.19
Supplemental Note: For time and one half overtime - $54.44 For double overtime - $58.69

Paver & Roadbuilder - Laborer

Paving and road construction work, regardless of material used, including but not limited to preparation of job sites, removal of old surfaces, asphalt and/or concrete, by whatever method, including but not limited to milling; laying of concrete; laying of asphalt for temporary, patchwork, and utility paving (but not production paving); site preparation and incidental work for installation of rubberized materials and similar surfaces; installation and repair of temporary construction fencing; slurry/seal coating, paving stones, maintenance of safety surfaces; play equipment installation, and other related work.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $44.48
Supplemental Benefit Rate per Hour: $50.19
Supplemental Note: For time and one half overtime - $54.44 For double overtime - $58.69

Production Paver & Roadbuilder - Screed Person

(Production paving is asphalt paving when using a paving machine or on a project where a paving machine is traditionally used)

Adjustment of paving machinery on production paving jobs.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $48.95
Supplemental Benefit Rate per Hour: $50.19
Supplemental Note: For time and one half overtime - $54.44 For double overtime - $58.69

Production Paver & Roadbuilder - Raker

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $48.35
Supplemental Benefit Rate per Hour: $50.19
Supplemental Note: For time and one half overtime - $54.44 For double overtime - $58.69

Production Paver & Roadbuilder - Shoveler

General laborer (except removal of surfaces - see Paver and Roadbuilder-Laborer) including but not limited to tamper, AC paint and liquid tar work.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $44.48
Supplemental Benefit Rate per Hour: $50.19
Supplemental Note: For time and one half overtime - $54.44 For double overtime - $58.69

Overtime Description
If an employee works New Year's Day or Christmas Day, they receive the single time rate plus 25%.

For Paid Holidays: Holiday pay for all holidays shall be prorated based two hours per day for each day worked in the holiday week, not to exceed 8 hours of holiday pay.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
Memorial Day
Independence Day
Labor Day
Columbus Day

Thanksgiving Day

Paid Holidays

Memorial Day
Independence Day
Labor Day
Thanksgiving Day

Shift Rates

When two shifts are employed, the work period for each shift shall be a continuous eight (8) hours. When three shifts are employed, each shift will work seven and one half (7 ½) hours but will be paid for eight (8) hours at the straight time rate since only one half (1/2) hour is allowed for meal time.
When two or more shifts are employed, single time will be paid for each shift.

Night Work - On night work, the first eight (8) hours of work will be paid for at the single time rate, except that production paving work shall be paid at 10% over the single time rate for the screed person, rakers and shovelers directly involved only. This differential is to be paid when there is only one shift and the shift works at night. All other workers will be exempt. Hours worked over eight (8) hours during said shift shall be paid for at the time and one-half rate.

(Local #1010)

PLASTERER

Plasterer

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $47.03
Supplemental Benefit Rate per Hour: $28.79

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When it is not possible to conduct work during regular working hours (between 6:30am and 4:30pm), a shift differential shall be paid at the regular hourly rate plus a twelve percent (12%) per hour differential. Workers on shift work shall be allowed a paid one-half hour meal break.

(Local #262)

PLASTERER - TENDER

Plasterer - Tender

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $39.95
Supplemental Benefit Rate per Hour: $31.99

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When work commences outside regular work hours, workers receive an hour additional (differential) wage and supplement payment. Eight hours pay for seven hours work or nine hours pay for eight hours work.

(Mason Tenders District Council)

PLUMBER

Plumber

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $72.50
Supplemental Benefit Rate per Hour: $41.45
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Plumber - Temporary Services

Temporary Services - When there are no Plumbers on the job site, there may be three shifts designed to cover the entire twenty-four hour period, including weekends if necessary, at the following rate straight time.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $58.08
Supplemental Benefit Rate per Hour: $33.08

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

30% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shifts Monday to Friday. 50% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shift work performed on weekends. For shift work on holidays, double time wages and fringe benefits shall be paid.

(Plumbers Local #1)

PLUMBER (MECHNICAL EQUIPMENT AND SERVICE)

(Mechanical Equipment and Service work shall include any repair and/or replacement of the present plumbing system.)

Plumber

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.60
Supplemental Benefit Rate per Hour: $19.96

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Plumbers Local # 1)

PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME CONSTRUCTION)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $50.35
Supplemental Benefit Rate per Hour: $29.73

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
30% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shifts Monday to Friday. 50% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shift work performed on weekends. For shift work on holidays, double time wages and fringe benefits shall be paid.

(Plumbers Local #1)

PLUMBER: PUMP & TANK
Oil Trades (Installation and Maintenance)

Plumber - Pump & Tank

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $69.73
Supplemental Benefit Rate per Hour: $28.48

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day

Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
All work outside the regular workday (8:00 A.M. to 3:30 P.M.) is to be paid at time and one half the regular hourly rate

(Plumbers Local #1)

POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER
(Exterior Building Renovation)

Journeyperson

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $58.83
Supplemental Benefit Rate per Hour: $30.10

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates

All work outside the regular work day (an eight hour workday between the hours of 6:00 A.M. and 4:00 P.M.) is to be paid at time and one half the regular rate. However, the employer may establish one (1) or two (2) shifts starting at or after 4:00 P.M. to be paid at the regular hourly rate plus a 10% differential.

(Bricklayer District Council)

ROOFER

Roofer

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $45.25
Supplemental Benefit Rate per Hour: $37.56

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Second shift - Regular hourly rate plus a 10% differential. Third shift - Regular hourly rate plus a 15% differential. There must be a first shift to work the second shift, and a second shift to work the third shift. All other work outside the regular work day (an eight hour workday between the hours of 5:00 A.M. and 4:00 P.M.) is to be paid at time and one half the regular rate.

(Local #8)

SHEET METAL WORKER

Sheet Metal Worker

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $52.10
Supplemental Benefit Rate per Hour: $55.18
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Sheet Metal Worker - Fan Maintenance

(The temporary operation of fans or blowers in new or existing buildings for heating and/or ventilation, and/or air conditioning prior to the completion of the project.)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $41.68
Supplemental Benefit Rate per Hour: $55.18

Sheet Metal Worker - Duct Cleaner

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $19.12
Supplemental Benefit Rate per Hour: $12.01

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Work that can only be performed outside regular working hours (eight hours of work between 7:30 A.M. and 3:30 P.M.) - First shift (work between 3:30 P.M. and 11:30 P.M.) - 10% differential above the established hourly rate. Second shift (work between 11:30 P.M. and 7:30 A.M.) - 15% differential above the established hourly rate.

For Fan Maintenance: On all full shifts of fan maintenance work the straight time hourly rate of pay will be paid for each shift, including nights, Saturdays, Sundays, and holidays.

(Local #28)

SHEET METAL WORKER - SPECIALTY
(Decking & Siding)

Sheet Metal Specialty Worker

The first worker to perform this work must be paid at the rate of the Sheet Metal Worker. The second and third workers shall be paid the Specialty Worker Rate. The ratio of One Sheet Metal Worker, then Two Specialty Workers shall be utilized thereafter.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $49.05
Supplemental Benefit Rate per Hour: $27.76
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Local #28)

SHIPYARD WORKER

Shipyard Mechanic - First Class

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $28.85
Supplemental Benefit Rate per Hour: $3.93

Shipyard Mechanic - Second Class

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $22.07
Supplemental Benefit Rate per Hour: $3.79

Shipyard Laborer - First Class

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $22.48
Supplemental Benefit Rate per Hour: $3.77

Shipyard Laborer - Second Class

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $17.93
Supplemental Benefit Rate per Hour: $3.78

Shipyard Dockhand - First Class

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $22.15
Supplemental Benefit Rate per Hour: $3.70

Shipyard Dockhand - Second Class

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $18.04
Supplemental Benefit Rate per Hour: $3.61

Overtime Description

Work performed on holiday is paid double time the regular hourly wage rate plus holiday pay.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Based on Survey Data

SIGN ERECTOR
(Sheet Metal, Plastic, Electric, and Neon)

Sign Erector

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $53.79
Supplemental Benefit Rate per Hour: $59.56

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Time and one half the regular hourly rate is to be paid for all hours worked outside the regular workday either (7:00 A.M. through 2:30 P.M.) or (8:00 A.M. through 3:30 P.M.)

(Local #137)

STEAMFITTER

Steamfitter

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $61.30
Supplemental Benefit Rate per Hour: $59.89
Supplemental Note: Overtime supplemental benefit rate: $119.04

Steamfitter -Temporary Services

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $46.59
Supplemental Benefit Rate per Hour: $48.70

Overtime Description
Double time after a 7 hour day except for Temporary Services.

Overtime
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
May be performed outside of the regular workday except Saturday, Sunday and Holidays. When shift work is performed the wage rate for regular time worked is a 15% percent premium on wage and 15% percent premium on supplemental benefits.

Local 638

STEAMFITTER - REFRIGERATION AND AIR CONDITIONER
(Maintenance and Installation Service Person)

Refrigeration and Air Conditioner Mechanic

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $43.85
Supplemental Benefit Rate per Hour: $19.96

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Christmas Day

Double time and one half the regular rate for work on the following holiday(s).
Martin Luther King Jr. Day
President's Day
Memorial Day
Columbus Day

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

(Local #638-B)

STONE MASON - SETTER

Stone Mason - Setter

(Assisted by Derrickperson and Rigger)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $57.16
Supplemental Benefit Rate per Hour: $50.17

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

Shift Rates
For all work outside the regular workday (8:00 A.M. to 3:30 P.M. Monday through Friday), the pay shall be straight time plus a ten percent (10%) differential.

(Bricklayers District Council)

TAPER

Drywall Taper

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $48.47
Supplemental Benefit Rate per Hour: $30.01

Overtime
Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays

Any worker who reports to work on Christmas Eve or New Year's Eve pursuant to his employer's instruction shall be entitled to three (3) hours afternoon pay without working.

(Local #1974)

TELECOMMUNICATION WORKER

(Install/maintain/repair telecommunications cables carrying data, video, and/or voice except for installation on building construction/alteration/renovation projects.)

Telecommunication Worker

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $47.03
Supplemental Benefit Rate per Hour: $23.15
Supplemental Note: The above rate applies for Manhattan, Bronx, Brooklyn, Queens. $22.84 for Staten Island only.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Lincoln's Birthday
Washington's Birthday

Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees have the option of observing either Martin Luther King's Birthday or the day after Thanksgiving instead of Lincoln's Birthday

Shift Rates

For any workday that starts before 8A.M. or ends after 6P.M. there is a 10% differential for the applicable worker's hourly rate.

Vacation

After 6 months.....one week.
After 12 months but less than 7 years.....two weeks.
After 7 or more but less than 15 years.....three weeks.
After 15 years or more but less than 25 years.....four weeks.

(C.W.A.)

TILE FINISHER

Tile Finisher

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $44.40
Supplemental Benefit Rate per Hour: $35.56

Overtime

Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TILE LAYER - SETTER

Tile Layer - Setter

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $57.41
Supplemental Benefit Rate per Hour: $40.11

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day

Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TIMBERPERSON

Timberperson

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $53.05
Supplemental Benefit Rate per Hour: $53.94

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate. Benefits for off-shift work shall be paid at the straight time rate.

(Local #1536)

TUNNEL WORKER

Blasters, Mucking Machine Operators (Compressed Air Rates)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $68.58
Supplemental Benefit Rate per Hour: $60.19

Tunnel Workers (Compressed Air Rates)

Includes shield driven liner plate portions or solidification portions work (8 hour shift) during excavation phase.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $66.14
Supplemental Benefit Rate per Hour: $58.29

Top Nipper (Compressed Air Rates)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $65.04
Supplemental Benefit Rate per Hour: $57.14

Outside Lock Tender, Outside Gauge Tender,Muck Lock Tender (Compressed Air Rates)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $63.74
Supplemental Benefit Rate per Hour: $56.20

Bottom Bell & Top Bell Signal Person: Shaft Person (Compressed Air Rates)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $63.74
Supplemental Benefit Rate per Hour: $56.20

Changehouse Attendant: Powder Watchperson (Compressed Air Rates)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $56.04
Supplemental Benefit Rate per Hour: $52.83

Blasters (Free Air Rates)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $65.41
Supplemental Benefit Rate per Hour: $57.80

Tunnel Workers (Free Air Rates)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $62.58
Supplemental Benefit Rate per Hour: $55.38

All Others (Free Air Rates)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $57.84
Supplemental Benefit Rate per Hour: $51.26

Microtunneling (Free Air Rates)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $50.06
Supplemental Benefit Rate per Hour: $44.30

Overtime Description

For work performed during excavation and primary concrete tunnel lining phases - Double time the regular rate after an 8 hour day and Saturday, Sunday and on the following holiday(s) listed below.
For Repair-Maintenance Work on Existing Equipment and Facilities - Time and one half the regular rate after a 7 hour day, Saturday, Sunday and double time the regular rate for work on the following holiday(s) listed below.
For Small-Bore Micro Tunneling Machines - Time and one-half the regular rate shall be paid for all overtime.
For work not listed above - Time and one half the regular rate after an 8 hour day and Saturday and double time the regular rate on Sunday and on the following holiday(s) listed below.

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

(Local #147)

UTILITY LOCATOR
(Locate & mark underground utilities for street excavation.)

Utility Locator (Year 7 and above)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $31.56
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 5 - 6)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $22.85
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 4)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $21.54
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 3)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $20.30
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 2)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $19.13
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 1)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $18.04
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Up to 1 year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $17.00
Supplemental Benefit Rate per Hour: $1.43
Supplemental Note: No benefits for the first 90 days of employment.

Overtime

Time and one half the regular rate for work on the following holiday(s).
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays

New Year's Day
Memorial Day
Independence Day
Thanksgiving Day
Christmas Day

Shift Rates

10% shift differential to employees working any shift starting between noon and 5 AM.

Vacation

For up to 1 year 0 hours
For year 1 - 2 48 hours per year
For year 3 - 9 96 hours per year
For year 10 or more 144 hours per year

Sick Days:
For up to 1 year employee receives 40 hours paid sick leave.
For year 1 employee earns 2 hours of paid sick leave for every 100 overtime hours worked.
For year 2 - 9 years employee earns 4 hours of paid sick leave for every 100 overtime hours worked.
For year 10 or more employee earns 6 hours of paid sick leave for every 100 overtime hours worked.

(C.W.A.)

WELDER

TO BE PAID AT THE RATE OF THE JOURNEYPERSON IN THE TRADE PERFORMING THE WORK.

OFFICE OF THE COMPTROLLER

CITY OF NEW YORK

CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Pursuant to Labor Law § 220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant and registered with the New York State Department of Labor, may be paid at the apprentice rates in this schedule. Apprentices who are not so registered must be paid as journey persons in accordance with the trade classification of the work they actually performed.

Apprentice ratios are established to ensure the proper safety, training and supervision of apprentices. A ratio establishes the number of journey workers required for each apprentice in a program and on a job site. Ratios are interpreted as follows: in the case of a 1:1, 1:4 ratio, there must be one journey worker for the first apprentice, and four additional journey workers for each subsequent apprentice.

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BOILERMAKER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Boilermaker (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $33.57

Boilermaker (Second Year: 1st Six Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $35.54

Boilermaker (Second Year: 2nd Six Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $37.51

Boilermaker (Third Year: 1st Six Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $39.48

Boilermaker (Third Year: 2nd Six Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 85% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $41.45

Boilermaker (Fourth Year: 1st Six Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $43.42

Boilermaker (Fourth Year: 2nd Six Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $45.39

(Local #5)

BRICKLAYER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Bricklayer (First 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.85

Bricklayer (Second 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.85

Bricklayer (Third 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.85

Bricklayer (Fourth 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.85

Bricklayer (Fifth 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.85

Bricklayer (Sixth 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.85

(Bricklayer District Council)

CARPENTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Carpenter (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour For Building Apprentice: $19.80
Supplemental Benefit Rate Per Hour For Building Apprentice: $16.85

Wage Rate Per Hour For Heavy Apprentice: $24.60
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $36.26

Carpenter (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour For Building Apprentice: $22.80
Supplemental Benefit Rate Per Hour For Building Apprentice: $18.35

Wage Rate Per Hour For Heavy Apprentice: $30.20
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $36.26

Carpenter (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour For Building Apprentice: $27.05
Supplemental Benefit Rate Per Hour For Building Apprentice: $21.95

Wage Rate Per Hour For Heavy Apprentice: $38.58
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $36.26

Carpenter (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour For Building Apprentice: $34.93
Supplemental Benefit Rate Per Hour For Building Apprentice: $23.95

Wage Rate Per Hour For Heavy Apprentice: $46.97
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $36.26

(Carpenters District Council)

CARPENTER - HIGH RISE CONCRETE FORMS
(Ratio of Apprentice to Journeyperson: 1 to 1, 2 to 5)

Carpenter - High Rise (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $18.27
Supplemental Benefit Rate per Hour: $16.55

Carpenter - High Rise (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $24.70
Supplemental Benefit Rate per Hour: $17.68

Carpenter - High Rise (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $31.28
Supplemental Benefit Rate per Hour: $17.81

Carpenter - High Rise (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $38.90
Supplemental Benefit Rate per Hour: $17.96

(Carpenters District Council)

CEMENT AND CONCRETE WORKER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Cement & Concrete Worker (First 1333 hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 53% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $14.79

Cement & Concrete Worker (Second 1333 hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 69% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $19.72

Cement & Concrete Worker (Last 1334 hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 85% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $21.30

(Cement Concrete Workers District Council)

CEMENT MASON
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cement Mason (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $19.92
Supplemental Benefit Rate per Hour: $15.61

Cement Mason (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $24.82
Supplemental Benefit Rate per Hour: $15.91

Cement Mason (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $30.22
Supplemental Benefit Rate per Hour: $16.02

(Local #780)

DERRICKPERSON & RIGGER (STONE)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Derrickperson & Rigger (stone) - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: 50% of Journeyperson's rate

Derrickperson & Rigger (stone) - Second Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

Derrickperson & Rigger (stone) - Second Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

Derrickperson & Rigger (stone) - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

(Local #197)

DOCKBUILDER/PILE DRIVER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Dockbuilder/Pile Driver (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: $24.60
Supplemental Benefit Rate Per Hour: $36.26

Dockbuilder/Pile Driver (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: $30.20
Supplemental Benefit Rate Per Hour: $36.26

Dockbuilder/Pile Driver (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: $38.58
Supplemental Benefit Rate Per Hour: $36.26

Dockbuilder/Pile Driver (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: $46.97

Supplemental Benefit Rate Per Hour: $36.26

(Carpenters District Council)

ELECTRICIAN
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Electrician (First Term: 0-6 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $18.00
Supplemental Benefit Rate per Hour: $15.68
Overtime Supplemental Rate Per Hour: $16.88

Electrician (First Term: 7-12 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $18.50
Supplemental Benefit Rate per Hour: $15.94
Overtime Supplemental Rate Per Hour: $17.17

Electrician (Second Term: 0-6 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $19.50
Supplemental Benefit Rate per Hour: $16.47
Overtime Supplemental Rate Per Hour: $17.76

Electrician (Second Term: 7-12 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $20.50
Supplemental Benefit Rate per Hour: $16.99
Overtime Supplemental Rate Per Hour: $18.35

Electrician (Third Term: 0-6 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $21.50
Supplemental Benefit Rate per Hour: $17.52
Overtime Supplemental Rate Per Hour: $18.94

Electrician (Third Term: 7-12 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $22.50
Supplemental Benefit Rate per Hour: $18.04
Overtime Supplemental Rate Per Hour: $19.53

Electrician (Fourth Term: 0-6 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $23.50
Supplemental Benefit Rate per Hour: $18.56
Overtime Supplemental Rate Per Hour: $20.12

Electrician (Fourth Term: 7-12 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $25.50
Supplemental Benefit Rate per Hour: $19.61
Overtime Supplemental Rate Per Hour: $21.30

Electrician (Fifth Term: 0-12 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $26.75
Supplemental Benefit Rate per Hour: $22.88
Overtime Supplemental Rate Per Hour: $24.57

Electrician (Fifth Term: 13-18 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $31.25
Supplemental Benefit Rate per Hour: $25.30
Overtime Supplemental Rate Per Hour: $27.28

Overtime Description
Overtime Wage paid at time and one half the regular rate

(Local #3)

ELEVATOR CONSTRUCTOR
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator (Constructor) - First Year

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $33.38

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $34.64

Elevator (Constructor) - Second Year

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $33.96

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $35.24

Elevator (Constructor) - Third Year

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $35.10

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $36.43

Elevator (Constructor) - Fourth Year

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $36.24

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $37.63

(Local #1)

ELEVATOR REPAIR & MAINTENANCE
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator Service/Modernization Mechanic (First Year)

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Per Hour: $33.33

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Per Hour: $34.59

Elevator Service/Modernization Mechanic (Second Year)

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Benefit Per Hour: $33.90

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Benefit Per Hour: $35.18

Elevator Service/Modernization Mechanic (Third Year)

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Per Hour: $35.03

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Per Hour: $36.37

Elevator Service/Modernization Mechanic (Fourth Year)

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Per Hour: $36.17

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Per Hour: $37.55

(Local #1)

ENGINEER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Engineer - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $27.47
Supplemental Benefit Rate per Hour: $30.97

Engineer - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $34.34
Supplemental Benefit Rate per Hour: $30.97

Engineer - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $37.77
Supplemental Benefit Rate per Hour: $30.97

Engineer - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $41.21
Supplemental Benefit Rate per Hour: $30.97

(Local #15)

ENGINEER - OPERATING
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Operating Engineer - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 40% of Operating Engineer - Road & Heavy Construction V's Rate
Supplemental Benefit Per Hour: $24.80

Operating Engineer - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 50% of Operating Engineer - Road & Heavy Construction V's Rate
Supplemental Benefit Per Hour: $24.80

Operating Engineer - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 60% of Operating Engineer - Road & Heavy Construction V's Rate

Supplemental Benefit Per Hour: $24.80

(Local #14)

FLOOR COVERER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Floor Coverer (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $24.80
Supplemental Benefit Rate per Hour: $16.83

Floor Coverer (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $27.80
Supplemental Benefit Rate per Hour: $18.33

Floor Coverer (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $32.05
Supplemental Benefit Rate per Hour: $21.93

Floor Coverer (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $39.93
Supplemental Benefit Rate per Hour: $23.93

(Carpenters District Council)

GLAZIER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Glazier (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Glazier (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Glazier (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Glazier (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #1281)

HAZARDOUS MATERIAL HANDLER
(Ratio of Apprentice Journeyperson: 1 to 1, 1 to 3)

Handler (First 1000 Hours)

Effective Period: 7/1/2022 - 7/3/2022
Wage Rate per Hour: $20.00
Supplemental Benefit Rate per Hour: $14.25

Effective Period: 7/4/2022 - 6/30/2023
Wage Rate per Hour: $20.00
Supplemental Benefit Rate per Hour: $14.75

Handler (Second 1000 Hours)

Effective Period: 7/1/2022 - 7/3/2022
Wage Rate per Hour: $21.00
Supplemental Benefit Rate per Hour: $14.25

Effective Period: 7/4/2022 - 6/30/2023
Wage Rate per Hour: $21.00
Supplemental Benefit Rate per Hour: $14.75

Handler (Third 1000 Hours)

Effective Period: 7/1/2022 - 7/3/2022
Wage Rate per Hour: $24.00
Supplemental Benefit Rate per Hour: $14.25

Effective Period: 7/4/2022 - 6/30/2023
Wage Rate per Hour: $24.00
Supplemental Benefit Rate per Hour: $14.75

Handler (Fourth 1000 Hours)

Effective Period: 7/1/2022 - 7/3/2022
Wage Rate per Hour: $26.00
Supplemental Benefit Rate per Hour: $14.25

Effective Period: 7/4/2022 - 6/30/2023
Wage Rate per Hour: $26.00
Supplemental Benefit Rate per Hour: $14.75

(Local #78)

HEAT & FROST INSULATOR
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Heat & Frost Insulator (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Heat & Frost Insulator (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Heat & Frost Insulator (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Heat & Frost Insulator (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

(Local #12)

HOUSE WRECKER
(TOTAL DEMOLITION)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

House Wrecker - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $20.80
Supplemental Benefit Rate per Hour: $10.67

House Wrecker - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $22.75
Supplemental Benefit Rate per Hour: $10.67

House Wrecker - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $24.25
Supplemental Benefit Rate per Hour: $10.67

House Wrecker - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $26.75
Supplemental Benefit Rate per Hour: $10.67

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Iron Worker (Ornamental) - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $20.63
Supplemental Benefit Rate per Hour: $17.61

Iron Worker (Ornamental) - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $24.22
Supplemental Benefit Rate per Hour: $18.86

Iron Worker (Ornamental) - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $27.80
Supplemental Benefit Rate per Hour: $20.12

Iron Worker (Ornamental) - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $31.38
Supplemental Benefit Rate per Hour: $21.38

(Local #580)

IRON WORKER - STRUCTURAL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Iron Worker (Structural) - 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $28.97
Supplemental Benefit Rate per Hour: $58.62

Iron Worker (Structural) - 7- 18 Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $29.57
Supplemental Benefit Rate per Hour: $58.62

Iron Worker (Structural) - 19 - 36 months

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

Wage Rate per Hour: $30.18
Supplemental Benefit Rate per Hour: $58.62

(Local #40 and #361)

LABORER (FOUNDATION, CONCRETE, EXCAVATING, STREET PIPE LAYER & COMMON)
(Ratio Apprentice to Journeyperson: 1 to 1, 1 to 3)

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - First 1000 hours

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $50.43

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Second 1000 hours

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $50.43

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Third 1000 hours

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $50.43

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Fourth 1000 hours

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Rate Per Hour: $50.43

(Local #731)

MARBLE MECHANICS
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cutters & Setters - First 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Cutters & Setters - Second 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 45% of Journeyperson's rate

Cutters & Setters - Third 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Cutters & Setters - Fourth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Cutters & Setters - Fifth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Cutters & Setters - Sixth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Cutters & Setters - Seventh 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

Cutters & Setters - Eighth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Cutters & Setters - Ninth 750 Hours

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

Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

Cutters & Setters - Tenth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 95% of Journeyperson's rate

Polishers & Finishers - First 900 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Polishers & Finishers - Second 900 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

Polishers & Finishers - Third 900 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 90% of Journeyperson's rate

(Local #7)

MASON TENDER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Mason Tender - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $20.95
Supplemental Benefit Rate per Hour: $10.82

Mason Tender - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $22.90
Supplemental Benefit Rate per Hour: $10.82

Mason Tender - Third Year

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

Wage Rate per Hour: **$24.40**
Supplemental Benefit Rate per Hour: **$10.82**

Mason Tender - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **$26.90**
Supplemental Benefit Rate per Hour: **$10.82**

(Local #79)

MASON TENDER (INTERIOR DEMOLITION WORKER)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Mason Tender (Interior Demolition) - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **$20.70**
Supplemental Benefit Rate per Hour: **$10.82**

Mason Tender (Interior Demolition) - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **$22.65**
Supplemental Benefit Rate per Hour: **$10.82**

Mason Tender (Interior Demolition) - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **$24.15**
Supplemental Benefit Rate per Hour: **$10.82**

Mason Tender (Interior Demolition) - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **$26.65**
Supplemental Benefit Rate per Hour: **$10.82**

(Local #79)

METALLIC LATHER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metallic Lather (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $22.55
Supplemental Benefit Rate per Hour: $17.87

Metallic Lather (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $23.60
Supplemental Benefit Rate per Hour: $16.87

Metallic Lather (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $24.60
Supplemental Benefit Rate per Hour: $15.92

Metallic Lather (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $37.18
Supplemental Benefit Rate per Hour: $21.82

(Local #46)

MILLWRIGHT
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Millwright (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $31.24
Supplemental Benefit Rate per Hour: $35.94

Millwright (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $36.69
Supplemental Benefit Rate per Hour: $39.64

Millwright (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $42.14
Supplemental Benefit Rate per Hour: $43.99

Millwright (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $53.04
Supplemental Benefit Rate per Hour: $50.75

(Local #740)

PAINTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Brush & Roller - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $17.20
Supplemental Benefit Rate per Hour: $17.42

Painter - Brush & Roller - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $21.50
Supplemental Benefit Rate per Hour: $22.41

Painter - Brush & Roller - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $25.80
Supplemental Benefit Rate per Hour: $26.46

Painter - Brush & Roller - Fourth Year

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

Wage Rate per Hour: $34.40
Supplemental Benefit Rate per Hour: $34.15

(District Council of Painters)

PAINTER - LINE STRIPING (ROADWAY)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Line Striping (Roadway) - First Year (Minimum 1000 hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $30.36
Supplemental Benefit Rate per Hour: $15.27

Painter - Line Striping (Roadway) - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $32.00
Supplemental Benefit Rate per Hour: $15.27

(Local #1010)

PAINTER - METAL POLISHER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metal Polisher (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $16.00
Supplemental Benefit Rate per Hour: $7.96
New Construction - Wage Rate Per Hour: $16.39
Scaffold Over 34 Feet - Wage Rate Per Hour: $18.50

Metal Polisher (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $17.00

Supplemental Benefit Rate per Hour: $7.96
New Construction - Wage Rate Per Hour: $17.44
Scaffold Over 34 Feet - Wage Rate Per Hour: $19.50

Metal Polisher (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $18.00
Supplemental Benefit Rate per Hour: $7.96
New Construction - Wage Rate Per Hour: $18.54
Scaffold Over 34 Feet - Wage Rate Per Hour: $20.50

(Local 8A-28)

PAINTER - STRUCTURAL STEEL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painters - Structural Steel (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Painters - Structural Steel (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Painters - Structural Steel (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #806)

PAVER AND ROADBUILDER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Paver and Roadbuilder - First Year (Minimum 1000 hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $29.86
Supplemental Benefit Rate per Hour: $24.60

Paver and Roadbuilder - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $32.00
Supplemental Benefit Rate per Hour: $24.60

(Local #1010)

PLASTERER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)
(Each Term is 800 Hours.)

Plasterer - First Term

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $17.48

Plasterer - Second Term

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $18.63

Plasterer - Third Term

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $20.93

Plasterer - Fourth Term

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $22.10

(Local #262)

PLASTERER - TENDER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plasterer Tender - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $21.45
Supplemental Benefit Rate per Hour: $10.32

Plasterer Tender - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $23.40
Supplemental Benefit Rate per Hour: $10.32

Plasterer Tender - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $24.90
Supplemental Benefit Rate per Hour: $10.32

Plasterer Tender - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $27.40
Supplemental Benefit Rate per Hour: $10.32

(Local #79)

PLUMBER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plumber - First Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $16.78
Supplemental Benefit Rate per Hour: $5.43

Plumber - First Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $19.78
Supplemental Benefit Rate per Hour: $6.43

Plumber - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $28.99
Supplemental Benefit Rate per Hour: $21.95

Plumber - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $31.09
Supplemental Benefit Rate per Hour: $21.95

Plumber - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $33.94
Supplemental Benefit Rate per Hour: $21.95

Plumber - Fifth Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $35.34
Supplemental Benefit Rate per Hour: $21.95

Plumber - Fifth Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $47.41
Supplemental Benefit Rate per Hour: $21.95

(Plumbers Local #1)

POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER

(Exterior Building Renovation)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $29.86
Supplemental Benefit Rate per Hour: $15.00

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $33.74
Supplemental Benefit Rate per Hour: $20.05

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $39.02
Supplemental Benefit Rate per Hour: $23.80

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $47.05
Supplemental Benefit Rate per Hour: $24.80

(Bricklayer District Council)

ROOFER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Roofer - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 35% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $3.82

Roofer - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $18.92

Roofer - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $22.64

Roofer - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $28.24

(Local #8)

SHEET METAL WORKER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Sheet Metal Worker (0-6 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 25% of Journeyperson's rate
Supplemental Rate Per Hour: $6.84

Sheet Metal Worker (7-18 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 35% of Journeyperson's rate
Supplemental Rate Per Hour: $20.20

Sheet Metal Worker (19-30 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: $27.48

Sheet Metal Worker (31-36 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $32.52

Sheet Metal Worker (37-42 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $32.52

Sheet Metal Worker (43-48 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $40.08

Sheet Metal Worker (49-54 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $40.08

Sheet Metal Worker (55-60 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $45.12

(Local #28)

SIGN ERECTOR
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Sign Erector - First Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 35% of Journeyperson's rate
Supplemental Rate Per Hour: $17.09

Sign Erector - First Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: $19.39

Sign Erector - Second Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: $21.70

Sign Erector - Second Year: 2nd Six Months

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

Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $24.02

Sign Erector - Third Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $32.50

Sign Erector - Third Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $35.35

Sign Erector - Fourth Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $39.00

Sign Erector - Fourth Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $41.95

Sign Erector - Fifth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $44.89

Sign Erector - Sixth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $47.80

(Local #137)

STEAMFITTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Steamfitter - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate and Supplemental Per Hour: 40% of Journeyperson's rate

Steamfitter - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate and Supplemental Rate Per Hour: 50% of Journeyperson's rate.

Steamfitter - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate and Supplemental Rate per Hour: 60% of Journeyperson's rate.

Steamfitter - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate and Supplemental Rate Per Hour: 70% of Journeyperson's rate.

Steamfitter - Fifth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate and Supplemental Rate Per Hour: 80% of Journeyperson's rate.

(Local #638)

STEAMFITTER - REFRIGERATION & AIR CONDITIONER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Refrigeration & Air Conditioner (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $21.23
Supplemental Benefit Rate per Hour: $13.29

Refrigeration & Air Conditioner (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $25.63
Supplemental Benefit Rate per Hour: $14.57

Refrigeration & Air Conditioner (Third Year)

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

Wage Rate per Hour: $29.85
Supplemental Benefit Rate per Hour: $15.91

Refrigeration & Air Conditioner (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $36.05
Supplemental Benefit Rate per Hour: $17.72

(Local #638-B)

STONE MASON - SETTER
(Ratio Apprentice of Journeyperson: 1 to 1, 1 to 2)

Stone Mason - Setters - First 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Second 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Third 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Fourth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Fifth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Sixth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 100% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

(Bricklayers District Council)

TAPER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Drywall Taper - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $20.97
Supplemental Benefit Rate per Hour: $14.25

Drywall Taper - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $24.24
Supplemental Benefit Rate per Hour: $21.26

Drywall Taper - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $29.08
Supplemental Benefit Rate per Hour: $23.01

Drywall Taper - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: $38.78
Supplemental Benefit Rate per Hour: $26.51

(Local #1974)

TILE LAYER - SETTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Tile Layer - Setter - First 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour:35% of Journeyperson's rate

Tile Layer - Setter - Second 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour 40% of Journeyperson's rate

Tile Layer - Setter - Third 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Tile Layer - Setter - Fourth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Tile Layer - Setter - Fifth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Tile Layer - Setter - Sixth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Tile Layer - Setter - Seventh 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

Tile Layer - Setter - Eighth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Tile Layer - Setter - Ninth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour:80% of Journeyperson's rate

Tile Layer - Setter - Tenth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 90% of Journeyperson's rate

(Local #7)

TIMBERPERSON
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Timberperson - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: $22.42
Supplemental Rate Per Hour: $36.22

Timberperson - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: $27.53
Supplemental Rate Per Hour: $36.22

Timberperson - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: $35.18
Supplemental Rate Per Hour: $36.22

Timberperson - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: $42.84
Supplemental Rate Per Hour: $36.22

(Local #1536)

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

Changes between the 1/1/2022 and 7/1/2022 Single Contract General Conditions

NOTE: The list below is intended as a guide and does not include minor editing.
The text of the General Conditions and the Addendum to the General Conditions govern.

Section No.	Change
01 10 00	1.10D: Update Mobilization Payment Add 1.13: Payments to M/WBE Subcontractors
01 22 00	New Section Added
01 40 00	1.7: update minimum and special experience qualifications
01 50 00	3.8B.3: Update DDC Field Office Trailer requirements 3.8D.3: Update Equipment for the DDC Field Office requirements
01 73 00	Add 3.25 Correction of the Work
01 77 00	Remove 3.2 Repair of the Work (moved into 017300, 3.25)

Department of Design and Construction

Issue Date: July 1, 2022

DDC STANDARD GENERAL CONDITIONS

FOR SINGLE CONTRACT PROJECTS

Department of Design and Construction

Issue Date: July 1, 2022

(No Text on This Page)

DIVISION 01 – DDC STANDARD GENERAL CONDITIONS – SINGLE CONTRACT PROJECTS
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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. PARTIAL PAYMENTS FOR MATERIALS IN ADVANCE OF THEIR INCORPORATION IN THE WORK PURSUANT TO ARTICLE 42 OF THE CONTRACT – In order to better ensure the availability of materials, fixtures and equipment when needed for the work, the Commissioner may authorize partial payment for certain materials, fixtures and equipment, prior to their incorporation in the work, but only in strict accordance with, and subject to, all the terms and conditions set forth in the Specifications, unless an alternate method of payment is elsewhere provided in the Specifications for specified materials, fixtures or equipment.

1. The Contractor must submit to the Commissioner a written request, in quadruplicate, for payment for materials purchased or to be purchased for which the Contractor needs to be paid prior to their actual incorporation in the work. The request must be accompanied by a schedule of the types and quantities of materials, and must state whether such materials are to be stored on or off the site.

2. Where the materials are to be stored off the site, they must be stored at a place other than the Contractor's premises (except with the written consent of the Commissioner) and under the conditions prescribed or approved by the Commissioner. The Contractor must set apart and separately store at the place or places of storage all materials and must clearly mark same "PROPERTY OF THE CITY OF NEW YORK", and further, must not at any time move any of said materials to another off-site place of storage without the prior written consent of the Commissioner. Materials may be removed from their place of storage off the site for incorporation in the work upon approval of the Resident Engineer.

3. Where the materials are to be stored at the site, they must be stored at such locations as will be designated by the Resident Engineer and only in such quantities as, in the opinion of the Resident Engineer, will not interfere with the proper performance of the Work by the Contractor or by other Contractors then engaged in performing work on the site. Such materials must not be removed from their place of storage on the site except for incorporation in the Work, without the approval of the Resident Engineer.

4. INSURANCE

   a. STORAGE OFF-SITE – Where the materials are stored off the site and until such time as they are incorporated in the Work, the Contractor must fully insure such materials against any and all risks of destruction, damage or loss including but not limited to fire, theft, and any other casualty or happening. The policy of insurance must be payable to the City of New York. It must be in such terms and amounts as must be approved by the Commissioner and must be placed with a company duly licensed to do business in the State of New York. The Contractor must deliver the original and one (1) copy of such policy or policies marked "Fully Paid" to the Commissioner.

   b. STORAGE ON THE SITE – Where the materials are stored at the site, the Contractor must furnish satisfactory evidence to the Commissioner that they are properly insured against loss, by endorsements or otherwise, under the policy or policies of insurance obtained by the Contractor to cover losses to materials owned or installed by the Contractor. The policy of insurance must cover fire and extended coverage against windstorm, hail, explosion and riot attending a strike, civil commotion, aircraft, vehicles and smoke.

5. All costs, charges and expenses arising out of the storage of such materials, must be paid by the Contractor and the City hereby reserves the right to retain out of any partial or final payment made under the Contract an amount sufficient to cover such costs, charges and expenses with the understanding that the City will have and may exercise any and all other remedies at law for the recovery of such cost, charges and expenses. There will be no increase in the Contract price for such costs, charges and expenses and the Contractor must not make any claim or demand for compensation therefore.

6. The Contractor must pay any and all costs of handling and delivery of materials, to the place of storage and from the place of storage to the site of the Work; and the City will have the right to retain from any partial or final payment an amount sufficient to cover the cost of such handling and delivery.

7. In the event that the whole or any part of these materials are lost, damaged, or destroyed in advance of their satisfactory incorporation in the work, the Contractor, at the Contractor's own cost, must replace such lost, damaged or destroyed materials of the same character and quality. The City will reimburse the Contractor for the cost of the replaced materials to the extent, and only to the extent, of the funds actually received by the City under the policies of insurance hereinbefore referred to. Until such time as the materials are replaced, the City will deduct from the value of the stored materials or from any other money due under the Contract, the amount paid to the Contractor for such lost, damaged or destroyed materials.

8. Should any of the materials paid for the City hereunder be subsequently rejected or incorporated in the work in a manner or by a method not in accordance with the Contract Documents, the Contractor must remove and replace, at Contractor's own cost, such defective or improperly incorporated material with materials complying with the Contract Documents. Until such materials are replaced, the City will deduct from the value of the stored materials or from any other money due the Contractor, the amount paid by the City for such rejected or improperly incorporated materials.

9. Payments for the cost of materials made hereunder will not be deemed to be an acceptance of such materials as being in accordance with the Contract Documents, and the Contractor always retains and must comply with the Contractor's duty to deliver to the site and properly incorporate in the work only materials which comply with the Contract Documents.

10. The Contractor must retain any and all risks in connection with the damage, destruction, or loss of the materials paid for hereunder to the time of delivery of the same to the site of the Work and their proper incorporation in the work in accordance with the Contract Documents.

11. The Contractor must comply with all laws and the regulations of any governmental body or agency pertaining to the priority purchase, allocation, and use of the materials.

12. When requesting payment for such materials, the Contractor must submit with the partial estimate duly authenticated documents of title, such as bills of sale, invoices or warehouse receipts, all in quadruplicate. The executed bills of sale must transfer title to the materials from the Contractor to the City. (In the event that the invoices state that the material has been purchased by a subcontractor, bills of sale in quadruplicate will also be required transferring title to the materials from subcontractor to the Contractor).

13. Where the Contractor, with the approval of the Commissioner, has purchased unusually large quantities of materials in order to assure their availability for the work, the Commissioner, at the Commissioner's option, may waive the requirements of Paragraph 12 provided the Contractor furnishes evidence in the form of an affidavit from the Contractor in quadruplicate, and such other proof as the Commissioner may require, that the Contractor is the sole owner of such materials and has purchased them free and clear of all liens and other encumbrances. In such event, the Contractor will pay for such materials and submit proof thereof, in the same manner as provided in Paragraph 12 hereof, within seven (7) days after receipt of payment therefore from the Comptroller. Failure on the part of the Contractor to submit satisfactory evidence that all such materials have been paid for in full, will preclude the Contractor from payments under the Contract.

14. The Contractor must include in each succeeding partial estimate requisition a summary of materials stored which must set forth the quantity and value of materials in storage, on or off the site, at the end of each preceding estimate period; the amount removed for incorporation in the

Work; the quantity and value of materials delivered during the current period and the total value of materials on hand for which payment thereof will be included in the current payment estimate.

15. Upon proof to the satisfaction of the Commissioner of the actual cost of such materials and upon submission of proper proof of title as required under Paragraph 12 or Paragraph 13 hereof, payment will be made therefore to the extent of 85%, provided however, that the cost so verified, established and approved must not exceed the estimated cost of such materials included in the approved detailed breakdown estimate submitted in accordance with Article 41 of the Contract; if it does, the City will pay only 85% approved estimated cost.

16. Upon the incorporation in the Work of any such materials, which have been paid for in advance of such incorporation in accordance with the foregoing provisions, payment will be made for such materials incorporated in the Work pursuant to Article 42 of the Contract, less any sums paid pursuant to Paragraph 15 herein.

D. MOBILIZATION PAYMENT – A line item for mobilization must be allowed on the Contractor's Detailed Bid Breakdown submitted in accordance with Article 41 of the Contract. The Mobilization Payment is intended to include the cost of required bonds, insurance coverage, and/or any other expenses required for the initiation of the Contract Work. All costs for mobilization will be deemed included in the total Contract Price. The Detailed Bid Breakdown must reflect, and the Mobilization Payment will be made, in accordance with the following schedule:

Contract Amount	**Mobilization Amount**
$0 - $10,000,000	8% of contract amount
$10,000,001 - $50,000,000	8% on the first $10,000,000 plus 4% of contract amount greater than $10,000,000
Over $50,000,000	$2,400,000

The Contractor may requisition for the Mobilization Payment upon satisfactory completion of the following:

1. DDC approval of the Detailed Bid Breakdown per Article 41 of the Contract;
2. Selection and DDC approval of any required field office location(s);
3. Submission of all required insurance certificates and bond;
4. Approval of the Site Safety Plan per the Safety Requirements Section of the Information for Bidders;
5. Approval of the Progress Schedule;
6. Approval of the Schedule Submittal; and,
7. Submission of the Pre-Construction Photographs.

E. ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING: The Contractor must submit reports to the Commissioner regarding the use of Ultra Low Sulfur Diesel Fuel in Non-Road Vehicles, and the implementation of Best Available Technology (BAT), as set forth in Article 5.4 of the Contract. Such reports must be submitted in accordance with the schedule, format, directions, and procedures established by the Commissioner.

1.11 PERFORMANCE OF WORK DURING NON-REGULAR WORK HOURS:

A. NON-REGULAR WORK HOURS: The Commissioner may issue a change order in accordance with Article 25 of the Contract which, (1) directs the Contractor to perform the Work, or specific components thereof, during other than regular work hours (i.e., evenings, weekends and holidays), and (2) provides compensation to the Contractor for costs in connection with the performance of Work during other than regular work hours. The Commissioner may issue a change order if a delay has occurred and such delay is not the fault of the Contractor, or if the Work is of such an important nature that delay in completing such work would result in serious disadvantage to the public.

B. PROCEDURE: The Contractor must: (1) obtain whatever permits may be required for performance of the Work during other than regular business hours, and (2) pay all necessary fees in connection with such permits. In addition, if directed by the Commissioner, the Contractor must make immediate application to the Commissioner of the Department of Labor, State of New York, for dispensation in accordance with Subdivision 2 of Section 220 of the Labor Law.

1.12 INTERRUPTION OF SERVICES AT EXISTING FACILITIES:

A. EVENING AND WEEKEND WORK - Where performance of the Work requires the temporary shutdown(s) of services, such shutdown(s) must be made at night or on weekends or at such times that will cause no interference with the established routines and operations of the facility in question.

1 Where weekend or evening work is required due to unavoidable service shutdowns, such work will be performed at no extra cost to the City. Components of the Work that must be performed during other than regular work hours are indicated in the Drawings and/or the Specifications.

B. INTERRUPTION OF EXISTING FACILITIES:

1 The Contractor must not interrupt any of the services of the facility nor interfere with such services in any way without the permission of the Commissioner. Such interruption or interferences must be made as brief as possible, and only at such time stated.

2 Under no circumstances will the Contractor, its subcontractors, or its workers, be permitted to use any part of the project as a shop, without the permission of the Commissioner.

3 Unnecessary noise must be avoided at all times and necessary noise must be reduced to a minimum.

4 Toilet facilities, water, and electricity must be operational at all times (i.e. 24/7). No services of the facility can be interrupted in any way without the permission of the Commissioner. Careful coordination of all Work with the Resident Engineer must be done to maintain the operational level of the Project personnel at the facility.

5 The Contractor must schedule the Work to avoid noise interference that will affect the normal functions of the facility. In particular, construction operations producing noises that are objectionable to the functions of the facility must be scheduled at times of day or night, day of the week, or weekend, which will not interfere with personnel at the facility. Any additional cost resulting from this scheduling will be borne by the Contractor.

6 The Contractor must arrange to work continuously, including evening and weekend hours, if required, to assure that services will be shut down only during the time actually required to make the necessary connections to the existing facility.

7 The Contractor must give ample written notice in advance to the Commissioner and personnel at the facility of any required shutdown.

1.13 PAYMENTS TO M/WBE SUBCONTRACTORS:

A. The Department of Design and Construction ("DDC") is committed to supporting the growth and success of Minority and Women-owned Business Enterprises ("M/WBE"). In furtherance of this goal, DDC complies with Local Law 1 / NYC Administrative Code section 6-129, as amended. In order to support the growth and success of M/WBEs on all DDC projects, it is important that M/WBE vendors that are sub-contractors (any tiers) are treated fairly at all times and that their payment requisitions / invoices are handled in accordance with the City's Standard Construction Contract. Pursuant to the Standard Construction Contract, prime contractors are required to pay subcontractors within thirty (30) days of receipt of such funds from DDC. Failure to comply with the Standard Construction Contract and the goals established by DDC as it applies to M/WBEs, may result in financial sanctions and negative performance evaluations, which will be taken into consideration on future procurements.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 22 00

EXPANDED WORK ALLOWANCE

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 22 00

PART I - GENERAL

1.1 PURPOSE

A. An Allowance has been established for the items set forth in sub-section 1.3 below ("Expanded Work Allowance" or "EWA"). Payment for the items set forth in sub-section 1.3 ("Expanded Work Items") may be made through the EWA, as directed by the Commissioner. "Extra Work", "overrun", and "Allowance" are defined by the Standard Construction Contract (see Articles 2.1.16, 26.1, and 2.1.4, respectively) and nothing in this Section alters, or will be deemed to alter the interpretation or application of, the Standard Construction Contract, including but not limited to Articles 25, 26, 28, and 78 of the Standard Construction Contract.

1.2 PROCESS

A. If the Commissioner determines that use of the EWA is appropriate, in their sole discretion, the Commissioner will prepare a written scope document for the Expanded Work Items for the Contractor's execution ("EWA Scope Memo"). The EWA Scope Memo will set forth the maximum amount payable from the EWA prior to the execution of a final cost memorandum ("Maximum Amount"), in accordance with this Section. The Maximum Amount may be increased from time to time by the Commissioner, in their sole discretion, except that the Maximum Amount may not exceed 80% of the Commissioner's estimated total cost for such Work (the "Estimated Cost") unless and until a final cost is determined and a final cost memorandum ("Final Cost Memo") executed in accordance with this Section.

B. Neither the Maximum Amount nor the Estimated Cost will be deemed to be the final cost of the Expanded Work Items. The final cost for the Expanded Work Items will be determined in accordance with Article 26 of the Standard Construction Contract. The Contractor must submit its detailed price proposal for the Expanded Work Items, calculated in accordance with the Contract, within the time period set forth in the EWA Scope Memo or within 90 Days after the executed EWA Scope Memo is issued to the Contractor, whichever is sooner.

C. Once the EWA Scope Memo is executed and the Contractor is directed to proceed with the Work, DDC will make progress payments, as provided in the Contract, up to the Maximum Amount or until the submission period has expired, whichever occurs sooner.

D. DDC will not make any progress payments for the performance of the Expanded Work Items beyond the submission period set forth in sub-Section C, above, unless and until a final cost has been determined and a Final Cost Memo executed in accordance with this Section. No amounts above the Maximum Amount set by the Commissioner will be payable from the EWA, unless and until a final cost has been determined and a Final Cost Memo executed in accordance with this Section. In all events, the Contractor shall promptly and diligently comply with the Commissioner's direction and perform all Work required by the Contract and the EWA Scope Memo.

E. Upon receipt of the Contractor's cost detailed proposal, DDC will evaluate the proposal and initiate negotiations, as necessary, to determine the final cost of the Expanded Work Items in accordance with Article 26 of the Standard Construction Contract. The Contractor is responsible to furnish time and material records

in accordance with Article 28 of the Standard Construction Contract until a Final Cost Memo is executed. If the parties cannot agree on a unit price or fixed price, the Contractor will be paid on the basis of time and material records in accordance with Article 26 the Standard Construction Contract.

F. A Final Cost Memo will be prepared by the Commissioner to be executed by the parties. The total net sum of the amounts added and/or credited under the EWA Scope Memo and payment of the finalized Final Cost Memo constitutes full accord and satisfaction for the costs resulting from the Expanded Work Items. In the event the EWA is insufficient to pay the full amount of the Final Cost Memo, the parties agree to execute change order documents for the remaining funds, subject to registration in accordance with the New York City Charter.

1.3 PRICE TO COVER

A. Expanded Work Items are those items set forth below. The EWA may be used, in the Commissioner's discretion, for the following Expanded Work Items:
   1. Non-material changes in the Work necessary to complete Contract Work due to site conditions that differ from those included in the Contract Documents and that could not have been anticipated by the Contractor.
   2. Non-material changes in the Work directed by the Commissioner that result in a net change in the cost to the Contractor for the Work to be performed under this Contract, including but not limited to the following:
      a. Overruns of unit price items and quantity increases in portions of work within a lump sum item.
      b. NYCDOT traffic stipulations or permit requirements that significantly differ from those included in the Contract Documents and that could not have been anticipated by the Contractor.
      c. Changes to the sizes of materials or changes to specifications of materials.
      d. Materials/structures not included in the Contract Documents that are necessary to complete Contract Work and that could not have been anticipated by the Contractor.

1.4 BASIS OF PAYMENT

A. The fixed sum must be considered the price bid for this item. The fixed sum is not to be altered in any manner by the bidder. Should the amount shown be altered, the new figures will be disregarded, and the original price will be used to determine the total amount bid for the contract.

B. The payment(s) made under this item will be equal to the Final Cost Memo prepared by the Commissioner and executed by the parties in accordance with 1.2(F) above as proof of work performed for this item as approved by the Commissioner.

C. The total estimated cost of this item is the "fixed sum" amount shown for this item in the Bid Submission Form and shall not be varied in the bid. The "fixed sum" amount is included in the bid solely to ensure that sufficient monies will be available to pay the Contractor for this work, which may be more or less than the fixed sum amount.

D. The price will cover the cost of all labor, materials, equipment, insurance, and incidentals necessary to complete the work under this section in accordance with the Contract Drawings, the specifications, and the directions of the Commissioner.

PART II – PRODUCTS (Not Used)
PART III – EXECUTION (Not Used)

END OF SECTION 01 22 00

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. LEED: Refer to the Addendum to identify whether this Project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

C. COMMISSIONING: Refer to the Addendum to identify whether this Project will be commissioned by an independent third party under separate contract with the City of New York (City). Commissioning will be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS, and/ or Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE COMMISSIONING. The Contractor must cooperate with the commissioning agent and provide whatever assistance is required.

1.2 SUMMARY:

A. This Section includes administrative provisions for coordinating construction operations on the Project, including:

1. Coordination Drawings
2. Administrative and supervisory personnel
3. Project meetings
4. Requests for Interpretation (RFIs)

B. This Section includes the following:

1. Definitions
2. Coordination
3. Submittals
4. Administrative and Supervisory Personnel
5. Project Meetings
6. Requests for Interpretation (RFI’s)
7. Correspondence
8. Contractor’s Daily Reports
9. Alternate and Substitute Equipment

C. Related Sections:

1. Section 01 10 00 SUMMARY
2. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
3. Section 01 33 00 SUBMITTALS
4. Section 01 35 26 SAFETY REQUIREMENTS
5. Section 01 73 00 EXECUTION REQUIREMENTS
6. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

7. Section 01 77 00 CLOSEOUT PROCEDURES

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 COORDINATION:

A. Coordination: The Contractor must coordinate its construction operations, including those of its subcontractors, with other entities to ensure the efficient and orderly installation of each part of the Work. The Contractor must coordinate the various operations required by different Sections of the Specifications that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence in order to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum access for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and access for required maintenance, service, and repair of all components, including mechanical and electrical.

B. The Contractor must prepare memoranda for distribution to its subcontractors and other involved entities, outlining special procedures required for coordination. Such memoranda must include required notices, reports, and meeting minutes as applicable.

C. Administrative Procedures: The Contractor must coordinate scheduling and timing of required administrative procedures with other construction activities and activities of its subcontractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include without limitation the following:

1. Preparation of Contractor's Construction Schedule.
2. Installation and removal of temporary facilities and controls.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Pre-installation conferences.
6. Startup and adjustment of systems.
7. Project closeout activities.

D. Conservation: The Contractor must coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

E. Salvaged Items, Material and/or Equipment: The Specifications may identify certain items, materials or equipment which must be salvaged by the Contractor and handled or disposed of as directed. The

Contractor must comply with all directions in the Specifications regarding the salvaging and handling of identified items, material or equipment.

F. Software: The Contractor may be required by the Commissioner to utilize a designated cloud-based Construction Management Tool to streamline and manage activities, including but not limited to the following:
1. Submittals;
2. Drawings, Specifications, and Bulletins;
3. RFI's;
4. Progress Photographs;
5. Letters and Correspondence;
6. Punchlists and Closeout Management;
7. Daily Logs;
8. Meetings and Minutes; and/or,
9. Change Order log memos.

1.5 SUBMITTALS:

A. Submit shop drawings, product data, samples etc., in compliance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. Coordination Drawings: The Contractor must prepare applicable Coordination Drawings in compliance with the requirements for Coordination Drawings in Section 01 33 00 SUBMITTAL PROCEDURES.

C. Safety Plan in compliance with Section 01 35 26 SAFETY REQUIREMENTS PROCEDURES.

D. Waste Management Plan in compliance with Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

E. Key Personnel Names: Within fifteen (15) Days after the Notice to Proceed (NTP), the Contractor must submit a list of key personnel assignments of the Contractor and its subcontractors, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in case of the absence of individuals assigned to Project.

1. Post copies of the list in Project meeting room, in temporary field office, and by each temporary telephone. Keep the list current at all times.

2. In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work. Include special personnel required for coordinating all operations by its subcontractors.

1.6 PROJECT MEETINGS:

A. General: The Resident Engineer will hold regularly scheduled construction progress meetings at the site, at which time the Contractor and appropriate subcontractors must have their representatives present to discuss all details relative to the execution of the work. The Resident Engineer will preside over these meetings.

1. Agenda: Prior to each meeting, the Resident Engineer will consult with the Contractor and will prepare an agenda of items to be discussed. In general, after informal discussion of any item on the agenda, the Resident Engineer will summarize the discussion in a brief written statement, and the Contractor will then dictate a brief statement for the record.

2. Coordination: In addition to construction progress meetings called by the Resident Engineer, the Contractor must hold regularly scheduled meetings for the purpose of coordinating, expediting and scheduling the work in accordance with the master coordinated Job Progress Chart. The Contractor and its subcontractors, material suppliers or vendors whose presence is necessary, are required to attend. These meetings may, at the discretion of the Contractor, be held at the same place and immediately following the Project meetings held by the Resident Engineer. Minutes of these meetings must be recorded, typed and printed by the Contractor and distributed to all parties concerned.

B. Preconstruction Kick-Off Meeting:

1. The Resident Engineer will schedule a preconstruction kick-off meeting either at DDC's main office or at the Project site to review responsibilities and personnel assignments and clarify the role of each participant. Unless otherwise directed, the Design Consultant will record and distribute meeting minutes.
2. Attendees: Authorized representative of the Sponsor Agency; Design Consultant; the Contractor and its superintendents, subcontractor(s) and their superintendent(s); LEED sub-consultant and Commissioning Authority /Agent (CxA) as applicable and other concerned parties. All participants at the meeting must be familiar with the Project and authorized to conclude matters relating to the Contract Work.
3. Agenda: Includes without limitation the following as applicable:
    a. Establishing construction schedule;
    b. Schedule for regular construction meetings;
    c. Phasing;
    d. Critical Work sequencing and long-lead items;
    e. Designation of key personnel and their duties;
    f. Reviewing application for payment and change order procedures;
    g. Procedures for RFIs;
    h. Review permits and approval requirements;
    i. Review all recent administrative code reporting requirements relating to the Project, (i.e. LL 77, LL86 etc.);
    j. Procedures for testing and inspecting;
    k. Reviewing special conditions at the Project site;
    l. Distribution of the Contract Documents;
    m. Submittal procedures;
    n. Safety procedures;
    o. LEED requirements;
    p. Commissioning requirements;
    q. Preparation of record documents;
    r. Historic Treatment requirements;
    s. Use of the premises;
    t. Work restrictions;
    u. Sponsor Agency occupancy requirements;
    v. Responsibility for temporary facilities, services, and controls;
    w. Construction Waste Management and Disposal;
    x. Indoor Air Quality Management Plan;

y. Dust Mitigation Plan;
z. Office, work, and storage areas;
aa. Equipment deliveries and priorities;
bb. Security;
cc. Progress cleaning; and,
dd. Working hours;

C. Construction Progress Meetings:
1. The Resident Engineer will schedule and conduct construction progress meetings at bi-weekly intervals or as otherwise determined. All participants at the meeting must be familiar with the Project and authorized to conclude matters relating to the Work. Unless otherwise directed, the Design Consultant will record and distribute meeting minutes.
2. Attendees:
a. Design Consultant and applicable sub-consultants;
b. Sponsor Agency Representative;
c. Representatives from the Contractor, sub-contractor(s), suppliers or other entities involved in the current progress, planning, coordination or future activities of the Work; and,
d. Other appropriate DDC personnel, DDC consultants and concerned parties.
3. Agenda: Includes without limitation the following:
a. Review the Construction Schedule and progress of the Work. Determine if the Work is on time, ahead of schedule or behind schedule. Determine actions to be taken to maintain or accelerate the schedule;
b. Review and approve prior meeting minutes and follow up open issues;
c. Coordinate work between each subcontractor;
d. Sequence of Operations;
e. Status of submittals, deliveries, and off-site fabrication;
f. Status of inspections and approvals by governing agencies;
g. Temporary facilities and controls;
h. Review Site Safety;
i. Quality and work standards;
j. Field observations;
k. Status of correction of deficient items;
l. RFI’s;
m. Pending changes;
n. Status of outstanding payments and change orders;
o. LEED requirements including Construction Waste Management, Indoor Air Quality Plan, Dust Mitigation and Commissioning; and,
p. Status of Administrative Code reporting requirements related to the Project.

D. Preinstallation Conferences:
1. The Contractor will conduct a preinstallation conference at project site before each construction activity when required by other specification Sections and when required for coordination with other construction.
2. Attendees:

a. Contractor and its superintendents
b. Applicable subcontractor(s)
c. Representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow.

3. Advise the Commissioner of scheduled preinstallation conference meeting dates.
4. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
   a. Contract Documents
   b. Related RFI's
   c. Deliveries
   d. Submittals
   e. Review of mockups
   f. Possible conflicts
   g. Compatibility requirements
   h. Time schedules
   i. Weather limitations
   j. Manufacturer's written instructions
   k. Warranty requirements
   l. Compatibility of materials
   m. Acceptability of substrates
   n. Temporary facilities and controls
   o. Space and access limitations
   p. Testing and inspecting requirements
   q. Installation procedures
   r. Coordination with other work
   s. Required performance results
   t. Protection of adjacent work

1.7 REQUESTS FOR INFORMATION (RFI):

A. Procedure: Immediately on discovery of the need for information or interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, the Contractor must prepare and submit an RFI in the form specified by the Resident Engineer.

1. RFI must originate with the Contractor. RFIs submitted by entities other than Contractor will be returned with no response.

2. Coordinate and submit RFI in a prompt manner to the Resident Engineer so as to avoid delays in Contractor's Work or Work of its subcontractors.

3. RFI Log: The Contractor must prepare, maintain, and submit a tabular log of RFIs organized by the RFI number monthly to the Resident Engineer, or more frequently if directed by the Resident Engineer.

4. On receipt of responses and action to the RFI, the Contractor must update the RFI log and immediately distribute the RFI response to affected parties. Review response(s) and notify the Resident Engineer immediately if the Contractor disagrees with response(s).

1.8 CORRESPONDENCE:

A. Copies of all correspondence to DDC must be sent directly to the Resident Engineer at the job site.

1.9 CONTRACTOR'S DAILY REPORTS:

A. The Contractor must prepare and submit Daily Construction Progress Reports as outlined in Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 31 00

(No Text on This Page)

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required Work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for establishing an effective base line schedule for the Project and documenting the progress of construction during performance of the Work by developing and revising as necessary, various documents including but not limited to the following:
   1. Submittals schedule
   2. Daily construction reports
   3. Material location reports
   4. Field condition reports
   5. Special reports

B. RELATED SECTIONS:

1.	Section 01 10 00	SUMMARY
2.	Section 01 32 22	PHOTOGRAPHIC DOCUMENTATION
3.	Section 01 32 16.10	PROJECT SCHEDULES (METHOD A)
4.	Section 01 32 16.20	PROJECT SCHEDULES (METHOD B)
5.	Section 01 32 16.30	PROJECT SCHEDULES (METHOD C)
6.	Section 01 33 00	SUBMITTAL PROCEDURES
7.	Section 01 40 00	QUALITY REQUIREMENTS

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

PART II – PRODUCTS

2.1 SUBMITTALS SCHEDULE:

A. Preparation: The Contractor must submit a schedule of submittals, arranged in chronological order by dates required by the construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates. The Submittals Schedule must show all of the following types of submittals:

1. Shop and Coordination Drawings
2. Material Samples
3. Catalog Cuts
4. Test and Evaluation Reports
5. Field Test Reports
6. Sample Warranties
7. Certificates
8. Qualification Data
9. Closeout Submittals

B. Submittals: At the kick-off meeting, the Contractor must have a preliminary Submittals Schedule, and must review this Schedule with the Resident Engineer and the Design Consultant. Within ten (10) Days after the kick-off meeting, the Contractor must complete the Submittals Schedule, including all submission dates, required delivery dates, and fabrication times. The Contractor must include an updated Submittals Schedule with all Progress Payment applications.

C. Review: The Resident Engineer will review the Submittals Schedule submitted by the Contractor. Upon acceptance, the Resident Engineer will date and sign the schedule as approved and transmit it to the Design Consultant, Contractor, and others within DDC as the Resident Engineer deems appropriate. If so directed by the Commissioner, the Contractor must revise the Submittals Schedule to indicate a submission date for specified shop drawings and/or material samples within sixty (60) Days after the kick-off meeting. The Contractor must resubmit the Submittals Schedule as necessary to include all review comments.

2.2 REPORTS:

A. Daily Construction Reports: The Contractor must submit to the Resident Engineer written Daily Construction Reports at the end of each day that work was performed, recording basic information such as the date, day, weather conditions, and contract days passed, remaining contract duration/days and the following information concerning the Project.

Information: The reports must be prepared by the Contractor's Superintendent and must bear the Contractor's Superintendent's signature. Each report must contain the following information:

1. List name of Contractor, subcontractors, their work force in each category, and details of activities performed;
2. The type of materials and/or major equipment being installed by the Contractor and/or by each subcontractor;
3. The major construction equipment being used by the Contractor and/or subcontractors;
4. Material and Equipment deliveries;
5. High and low temperatures and general weather conditions;
6. Accidents;
7. Meetings and significant decisions;
8. Unusual events;
9. Stoppages, delays, shortages, and losses;
10. Meter readings and similar recordings;

11. Emergency procedures;
12. Orders and/or requests of authorities having jurisdiction;
13. Approved Change Orders received and implemented;
14. Field Orders and Directives received and implemented;
15. Services connected and disconnected;
16. Equipment or system tests and startups;
17. Partial Completion(s) and occupancies; and,
18. Substantial Completion(s) authorized;

NOTE: If there is NO ACTIVITY at site, a daily report indicating so and the reason for no activity at the site must be submitted.

B. Material Location Reports: The Contractor must submit a Material Location Report at weekly OR monthly intervals as determined and established by the Resident Engineer. Such report must include a comprehensive list of materials delivered to and stored at Project site. List must be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit a Request For Information (RFI) form with a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.3 SPECIAL REPORTS:

A. Accident report, incident report, special condition report for the conditions out of control of any party involved with the Project effecting Project progress, explaining impact on the Project schedule and cost if any.

PART III – EXECUTION (Not Used)

END OF SECTION 01 32 00

(No Text on This Page)

SECTION 01 32 16.10
PROJECT SCHEDULES (METHOD A)

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 16.10

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:

1. Methods
2. Definitions
3. Preliminary, Baseline, and Project Schedule Preparation Timeline
4. Preliminary Project Schedule Development
5. Project Schedule
6. Activity and Calendar Coding Structure
7. Work Breakdown Structure (WBS)
8. Major Milestones
9. Short (Three-Week) Interval/Two-Week Look-Ahead
10. Submittals
11. Project Schedule Updating
12. Time Impact Analysis

1.3 METHODS:

A. The Contractor must comply with Project schedule development and updating requirements as specified herein.

1. The Contractor must employ or retain the services of a Construction Scheduler with verifiable construction scheduling experience, subject to review and acceptance by the City. Upon request, the Contractor must provide the City with details of qualifications and experience of the proposed scheduling staff member(s).

2. The Contractor must prepare, update, and maintain a detailed Project Schedule using a version of scheduling software that is compatible with the City's Oracle Primavera P6 Enterprise Project Portfolio Management (EPPM). All schedule submittals must be developed using Oracle's Primavera P6 EPPM software. Schedules must be developed using accepted CPM techniques using the precedence diagramming method (PDM). The Project Schedule must be developed following Defense Contract Management Agency (DCMA) and American Association of Cost Engineering International (AACE International) guidance. The Contractor will be required to use the Contractor's

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.

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;

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 Engineer with all requests for time extension.

B. The Time Impact Analysis must include a written narrative and supporting impact schedule Fragnet detailing the Project delays resulting from the alleged delay. The impact schedule Fragnet, separate and distinct from the Progress Schedule update, must demonstrate that the changes or anticipated delays affect Activities of the current accepted Progress Schedule. The impact schedule will be incorporated into the Progress Schedule only after it is accepted by the Commissioner and a time extension is approved. The Fragnet submitted as part of the Time Impact Analysis must illustrate the impact of these changes or delays on the date for Substantial Completion.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 32 16.10

SECTION 01 32 16.20
PROJECT SCHEDULES (METHOD B)

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 16.20

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

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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.

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.

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

(No Text on This Page)

SECTION 01 32 16.30
PROJECT SCHEDULES (METHOD C)

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 16.30

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:

1. Methods
2. Definitions
3. Preliminary, Baseline, and Project Schedule Preparation Timeline
4. Preliminary Project Schedule Development
5. Project Schedule
6. Activity and Calendar Coding Structure
7. Work Breakdown Structure (WBS)
8. Major Milestones
9. Short (Three-Week) Interval/Two-Week Look-Ahead
10. Submittals
11. Project Schedule Updating
12. Time Impact Analysis

1.3 METHODS:

A. The Contractor must comply with Project schedule development and updating requirements as specified herein.

1. The Contractor must employ or retain the services of a Construction Scheduler with verifiable construction scheduling experience, subject to review and acceptance by the City. Upon request, the Contractor must provide the City with qualifications and experience of the proposed scheduling staff member(s).

2. The Contractor must prepare, update, and maintain a detailed Project Schedule using a version of scheduling software that is compatible with the City's Oracle Primavera P6 Enterprise Project Portfolio Management (EPPM). All schedule submittals must be developed using Oracle's Primavera P6 EPPM software. Schedules must be developed using accepted CPM techniques using the Precedence Diagramming Method (PDM). The Project Schedule must be developed following Defense Contract Management Agency (DCMA), and American Association of Cost Engineering International (AACE International) guidance. The Contractor will be required to use the Contractor's own P6 license (whether single-user or Enterprise

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.
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Term	Definition
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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).
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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.

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;

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 Resident Engineer. Such Progress Photographs must be included in each monthly progress report or as otherwise directed by the Resident Engineer.

D. Digital Files: Submit digital files in the format required.

1.5 QUALITY ASSURANCE:

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three (3) years.

1.6 COORDINATION:

A. The Contractor and its subcontractor(s) must cooperate with the photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, such as temporary lighting required to produce clear and well-lit photographs without obscuring shadows.

1.7 COPYRIGHT:

A. The Contractor must include the provisions of this Subsection 1.7 in the agreement between the Contractor and the Photographer who will provide the construction photographs described in this Section. The Contractor must submit to the Resident Engineer a copy of its agreement with the Photographer.

B. Any photographs, images and/or other materials produced pursuant to this Agreement, and any and all drafts and/or other preliminary materials in any format related to such items produced pursuant to this Agreement, will, upon their creation, become the exclusive property of the City.

C. Any photographs, images and/or other materials provided pursuant to this Agreement ("Copyrightable Materials") will be considered "work-made-for-hire" within the meaning and purview of Section 101 of the United States Copyright Act, 17 U.S.C. § 101, and the City will be the copyright owner thereof and of all aspects, elements and components thereof in which copyright protection might exist. To the extent that the Copyrightable Materials do not qualify as "work-made-for-hire," the Photographer hereby irrevocably transfers, assigns and conveys exclusive copyright ownership in and to the Copyrightable Materials to the City, free and clear of any liens, claims, or other encumbrances. The Photographer will retain no copyright or intellectual property interest in the Copyrightable Materials. The Copyrightable Materials must be used by the Photographer for no purpose other than in the performance of this Agreement without the prior written permission of the City. The Department may grant the Photographer a license to use the Copyrightable Materials on such terms as determined by the Department and set forth in the license.

D. The Photographer acknowledges that the City may, in its sole discretion, register copyright in the Copyrightable Materials with the United States Copyright Office or any other government agency authorized to grant copyright registrations. The Photographer must fully cooperate in this effort and agrees to provide any and all documentation necessary to accomplish this.

E. The Photographer represents and warrants that the Copyrightable Materials: (i) are wholly original material not published elsewhere (except for material that is in the public domain); (ii) do not violate any copyright Law; (iii) do not constitute defamation or invasion of the right of privacy or publicity; and (iv) are not an infringement, of any kind, of the rights of any third party. To the extent that the Copyrightable Materials incorporate any non-original material, the Photographer has obtained all necessary permissions and clearances, in writing, for the use of such non-original material under this Agreement, copies of which must be provided to the City.

PART II – PRODUCTS

2.1 PHOTOGRAPHIC MEDIA:

A. Digital Images: Digital files must be captured as 7.2 megapixel files or greater, with a minimum pixel array of 2,400 pixels by 3,000 pixels. The camera used to capture the digital files must be a Digital SLR (Single Lens Reflex) camera or approved equal; "point and shoot" cameras or camera phones are not acceptable. Digital cameras must produce images using true optical resolution; "digital zoom" is not acceptable. Images must not be resized or interpolated. The file format for digital files must be Joint Photographic Experts Group format ("JPG"). The digital files must not be modified or processed in any way to alter the JPG file's metadata, including the photograph's original capture date.

B. Digital Files: Digital files must be submitted on Digital Versatile Disk ("DVD") or as specified by the Commissioner. DVDs must be inserted in standard weight Archival Quality clear poly sheet protectors and submitted in a hard cover three (3) ring binder. The information imprinted on each print must be provided on an Excel file included on the DVD. The DVD must be labeled with the Project ID and the Project description. Labeling using adhesive labels is not acceptable.

C. Prints:
   1. Format: 8-by-10-inch (203-by-254-mm) smooth-surface matte color prints on single-weight commercial-grade stock paper, with 1-inch wide margins and punched for standard 3-ring binder.
   2. Identification: On the front of each photograph affix a label in the margin with Project name and date photograph was taken. On the back of each print, provide an applied label or rubber-stamped impression with the following information:
      a. Project Contract I.D. Number.
      b. Project Contract Name.
      c. Name of Contractor. (and Subcontractor Trade Represented)
      d. Subject of Image Taken.
      e. Date and time photograph was taken if not date stamped by camera.
      f. Description of vantage point, indicating location, direction and other pertinent information.
      g. Unique sequential identifier.
      h. Name and address of photographer.

PART III – EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS:

A. General: Take photographs that provide the largest possible depth-of-field while still in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
   1. Maintain key plan with each set of construction photographs that identifies each photographic location and direction of view.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
   1. Date and Time: Include date and time in filename for each image.
   2. Field Office Images: Maintain one set of images on USB drive, or other electronic media requested by the Commissioner, in the field office at the Project site so that it is available at all times for reference. Ensure that the images are the same as for those submitted to Commissioner.

3.2 PRE-CONSTRUCTION & PRE-DEMOLITION PHOTOGRAPHS:

A. Before commencement of Contract Work at the Project site, take color photographs of Project site and surrounding properties, including existing structures or items to remain during construction, from different vantage points, as directed by the Resident Engineer.
   1. Flag applicable excavation areas and construction limits before taking construction photographs.

2. Take photographs of minimum eight (8) views to show existing conditions adjacent to property before starting the Work.
3. Take applicable photographs of minimum eight (8) views of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
4. Take additional photographs as required or directed by the Resident Engineer to record settlement or cracking of adjacent structures, pavements, and improvements.

B. Demolition Operations: Take photographs as directed by the Resident Engineer of minimum of eight (8) views each before commencement of demolition operations, at mid-point of operations and at completion of operations.

C. Pre-Demolition Photographs: Take archival quality color photographs, to include all exterior building facades, of all structures at the Project site designated to be fully demolished or removed in compliance with New York City Building Code requirements. Submit four (4) complete sets of pre-demolition photographs, in the format specified herein, to the Resident Engineer for submission to the New York City Department of Buildings.

3.3 PERIODIC CONSTRUCTION PROGRESS PHOTOGRAPHS:

A. Take photographs of minimum eight (8) views bi-weekly as directed by the Resident Engineer of construction progress for each contract trade. Select vantage points to show status of construction and progress since last photographs were taken.

3.4 SPECIAL PHOTOGRAPHS:

A. The photographer must take special photographs of subject matter or events as specified in other sections of the Project Specifications from vantage points specified or as otherwise directed by the Resident Engineer.

B. Historical Elements: As required in Section 01 35 91 HISTORIC TREATMENT PROCEDURES, for Contract Work at designated landmark structures or sites, the photographer, as specified and required by individual sections of the Contract documents or at the direction of the Commissioner, must take images of existing elements scheduled to be removed for replacement, repair or replication in quantities as directed, including post-construction photographs of completed Work as directed by the Commissioner.

1. Take Presentation Quality Photographs of designated landmark structures as directed by the Commissioner for submission to the New York City Landmarks Preservation Commission. Provide a minimum of four (4) color photographic prints of each view as directed.

3.5 VIDEO RECORDING:

A. When Video Recording of Demonstration and Orientation sessions is required, the Contractor must provide the services of a Videographer as indicated in Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

3.6 FINAL COMPLETION CONSTRUCTION PHOTOGRAPHS:

A. For submission as Project Record Documents, take color photographs of minimum eight (8) unobstructed views of the completed Project and/or Project site, as directed by the Commissioner and after all scaffolding, hoists, shanties, field offices or other temporary work has been removed and final cleaning has been done after date of Substantial Completion. Submit four (4) sets of each view of Presentation Quality photographic prints, including negatives and/or digital images electronic file.

END OF SECTION 01 32 33

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART I – GENERAL:

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Coordination Drawings, Catalogue Cuts, Material Samples, and other Submittals required by the Contract Documents.
B. Review of Submittals does not relieve the Contractor of responsibility for any Contractor's errors or omissions in such Submittals, nor from responsibility for complying with the requirements of the Contract.
C. Responsibility of the Contractor: The approval of Shop Drawings will be general and will not relieve the Contractor of the following responsibilities:
   1. Accuracy of such Shop Drawings;
   2. Proper fitting and construction of the Work
   3. Furnishing of materials or Work required by the Contract that may not be indicated on the Shop Drawings.
D. Approval of Shop Drawings must not be construed as approving departures from the Contract Drawings, Supplementary Drawings, or Specifications.
E. This Section includes the following:
   1. Definitions
   2. Submission Procedures
   3. Coordination Drawings
   4. LEED Submittals
   5. Ultra Low Sulfur Diesel Fuel Reporting
   6. Construction Photographs and Recordings
   7. As-Built Documents

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
D. Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION
E. Section 01 40 00 QUALITY REQUIREMENTS
F. Section 01 77 00 CLOSEOUT PROCEDURES
G. Section 01 78 39 CONTRACT RECORD DOCUMENTS
H. Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS
I. Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS
J. Section 01 81 13.10 ENVIRONMENTALLY PREFERABLE PURCHASING (EPP) COMPLIANCE

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and Specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Action Submittals: Written and graphic information, or physical samples that require responsive actions and include, without limitation, all Shop Drawings, product data, letters of certification, tests and other information required for quality control and as required by the Contract Documents.

D. Informational Submittals: Written and graphic information that does not require responsive action. Informational Submittals may be rejected for non-compliance with the Contract.

E. Shop Drawings: Drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, except for coordination drawings, specifically prepared for the Project by the Contractor or any subcontractor, manufacturer, supplier or distributor, which illustrates how specific portions of the Work must be fabricated and/or installed.

F. Coordination Drawings: As required in Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.

G. Product Data and Quality Assurance Submittals: Includes manufacturer's standard catalogs, pamphlets, and other printed materials including without limitation the following:

1. Catalogue and Product specifications
2. Installation instructions
3. Color charts
4. Catalog cuts
5. Rough-in diagrams and templates
6. Wiring diagrams
7. Performance curves
8. Operational range diagrams
9. Mill reports
10. Design data and calculations
11. Certification of compliance or conformance
12. Manufacturer's instructions and field reports

1.5 COORDINATION DRAWINGS:

A. Coordination Drawings, General: When coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity, or where limited space availability necessitates coordination, prepare Coordination Drawings according to requirements in individual Sections as a prerequisite to submittal of Shop Drawings.

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

(No Text on This Page)

SECTION 01 35 03

GENERAL MECHANICAL REQUIREMENTS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 03

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. The General Mechanical Requirements contained herein must be followed by the Contractor, as well as its subcontractor for HVAC work. This Section sets forth the General Requirements applicable to mechanical work for the Project. Such requirements are intended to be read in conjunction with the Specifications and Contract Drawings for the Project. In the event of any conflict between the requirements set forth in this Section and the requirements of the Specifications and/or the Contract Drawings, whichever requirement is the most stringent must take precedence.

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 35 06 GENERAL ELECTRICAL REQUIREMENTS
D. Section 01 42 00 REFERENCES
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. CONCEALED PIPING AND DUCTS: piping and ducts hidden from sight in masonry or other construction, in floor fill, trenches, partitions, hung ceilings, furred spaces, pipe shafts and in service tunnels not used for passage. Where piping and ducts run in areas that have hung ceilings, such piping and ducts must be installed in the hung ceilings. For Work on existing piping, any insulation on such existing piping is to be tested for asbestos and abated if found to be positive by a certified asbestos contractor. Such testing and abatement must occur prior to the performance of any Work on these pipes.

1.5 SUBMITTALS:

A. INTENT OF MECHANICAL CONTRACT DRAWINGS – Mechanical Contract Drawings are, in part, diagrammatic and show the general arrangement of the equipment, ducts, and piping included in the Contract and the approximate size and location of the equipment.

B. The Contractor must follow these Contract Drawings in laying out the Work and verify the spaces in which it will be installed. The Contractor must submit, as directed, Mechanical Shop Drawings, roughing drawings,

manufacturer's Shop Drawings, field drawings, cuts, bulletins, etc., of all materials, equipment and methods of installation shown or specified in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1. Submit sheet metal shop standards. Submit manufacturer's product data including gauges, materials, types of joints, scaling materials and installations for metal ductwork materials and products.
2. Submit scaled layout drawing (3/8"=1') of metal ductwork and fittings including, but not limited to, duct sizes, locations, elevations, slopes of horizontal runs, wall and floor penetrations and connections. Show modifications of indicated requirements made to conform to local shop practice and how those modifications ensure that free area, materials and rigidity are not reduced. Layouts should include all the room plans, mechanical equipment rooms and penthouses. Method of attachment of duct hangers to building construction all with the support details. Coordinate Shop Drawings with related trades prior to submission.
3. Indicate duct fittings, particulars such as gauges, sizes, welds and configuration prior to start of work for low-pressure systems.
4. Submit maintenance data and parts lists for metal ductwork materials and products. Include this data, product data and shop drawings in maintenance manual.

1.6 ACCESS:

A. All Work must be installed by the Contractor to readily provide access for inspection, operation, maintenance and repair. Minor deviations from the arrangement indicated on the Contract Drawings may be made to accomplish this, but they must not be made without prior written approval by the Commissioner.

1.7 CHANGES IN PIPING, DUCTS, AND EQUIPMENT:

A. Wherever field conditions are such that for proper execution of the Work, reasonable changes in location of piping, ducts, and equipment are necessary and required, the Contractor must make such changes as directed and approved, without extra cost to the City.

1.8 CLEANING OF PIPING, DUCTS, AND EQUIPMENT:

A. Piping, ducts, and equipment must be thoroughly cleaned by the Contractor of all dirt, cuttings, and other foreign substances. Should any pipe, duct, or other part of the several systems be obstructed by any foreign matter, the Contractor will be required to pay for disconnecting, cleaning, and reconnecting wherever necessary for the purpose of locating and removing obstructions. The Contractor must pay for repairs to other work damaged in the course of removing obstructions. For work on existing piping, ducts, and equipment, the Contractor must pay special attention during this task so as not to disturb the insulation on such piping, ducts, or equipment.

1.9 STANDARDIZATION OF SIMILAR EQUIPMENT:

A. Unless otherwise particularly specified, all equipment of the same kind, type, or classification, used for identical purposes, must be the product of one (1) manufacturer.

1.10 SUPPORTING STRUCTURES DESIGNED BY THE CONTRACTOR:

A. Unless otherwise specified, supporting structures for equipment to be furnished by the Contractor must be designed by an Engineer licensed in New York State retained by the Contractor. Supporting structures must be built by the Contractor of sufficient strength to safely withstand all stresses to which they may be

subjected, within permissible deflections, and must meet the following standards:

1. Structural Steel - ASTM Standard Specifications, AISC and New York City Construction Codes.
2. Concrete for supports for equipment must conform to the Specifications for concrete herein, but in no case must be less than the requirements of the New York City Construction Codes for average concrete.
3. Steel reinforcement for concrete must be of intermediate grade and must meet the requirements of the Standard Specifications for Billet Steel-Concrete Reinforcement Bars, ASTM.
4. Drawings and calculations must be submitted for review and acceptance in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1.11 ELIMINATION OF NOISE:

A. All systems and/or equipment provided under the Contract must operate without objectionable noise or vibration.

B. Should operation of any one or more of the several systems produce noise or vibration which is, in the opinion of the Commissioner, objectionable, the Contractor must, at its own expense, make changes in piping, equipment, etc., and do all work necessary to eliminate objectionable noise or vibration.

C. Should noise or vibration that is found objectionable by the Commissioner be transmitted by any pipe or portions of the structure from systems and/or equipment installed under the Contract, the Contractor must, at its own expense, install such insulators and make such changes in or additions to the installations as may be necessary to prevent transmission of this noise or vibration.

1.12 PRELIMINARY FIELD TEST:

A. As soon as conditions permit, the Contractor must furnish all necessary labor and materials for, and must make preliminary field tests of the equipment to ascertain compliance with the requirements of the Contract. If the preliminary field tests disclose equipment that does not comply with the Contract, the Contractor must, prior to the acceptance test, make all changes, adjustments, and replacements as required.

1.13 INSTRUCTIONS ON OPERATION:

A. At the time the equipment is placed in permanent operation by the City, the Contractor must make all adjustments and tests required by the Commissioner to prove that such equipment is in proper and satisfactory operating condition. The Contractor must instruct the City's operating personnel on the proper maintenance and operation of the equipment for the period of time called for in the Specifications.

1.14 CERTIFICATES:

A. On completion of the Work, the Contractor must obtain certificates of inspection, approval, and acceptance, and be in compliance with all laws from all agencies and/or entities having jurisdiction over the Work and must deliver these certificates to the Commissioner in accordance with Section 01 77 00 CLOSEOUT PROCEDURES. The Work will not be deemed substantially complete until the certificates have been delivered.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 35 03

(No Text on This Page)

SECTION 01 35 06
GENERAL ELECTRICAL REQUIREMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section sets forth the General Requirements applicable to electrical work for the Project. Such requirements are intended to be read in conjunction with the Specifications and Contract Drawings for the Project. In the event of any conflict between the requirements set forth in this Section and the requirements of the Project Specifications and/or the Contract Drawings, whichever requirement is the most stringent, as determined by the Commissioner, must take precedence.

B. This Section includes the following:
   1. Related Sections
   2. Definitions
   3. Procedure for Electrical Approval
   4. Submittals
   5. Electrical Installation Procedures
   6. Electrical Conduit System Including Boxes (Pull, Junction and Outlet)
   7. Electrical Wiring Devices
   8. Electrical Conductors and Terminations
   9. Circuit Protective Devices
   10. Distribution Centers
   11. Motors
   12. Motor Control Equipment

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 35 03 GENERAL MECHANICAL REQUIREMENTS
D. Section 01 42 00 REFERENCES
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. WIRING: contains wire and raceway (rigid steel, heavy wall conduit unless specifically indicated otherwise).

B. POWER WIRING: wiring from a panel board or other specified source to a starter (if required), then to a disconnect (if required), then to the final point of usage such as a motor, unit, or device.

C. CONTROL and/or INTERLOCK WIRING: wiring that signals the device to operate or shut down in response to a signal from a remote control device such as a temperature, smoke, pressure, float, etc. device (starters and disconnect switches are not included in this definition) regardless of the voltage required for the controlling device.

D. RIGID STEEL CONDUIT: rigid steel heavy wall conduit that is hot-dip galvanized inside and outside. The conduit must meet the requirements of the latest edition, as amended, of the "Standard for Rigid Steel Conduit" of the Underwriters' Laboratories, Inc. Unless otherwise specified in the Specifications or indicated on the Contract Drawings, rigid steel conduit must be used for all exposed work, all underground conduits in contact with earth, and fire alarms systems, as required by the New York City Construction Codes.

E. ELECTRICAL METALLIC TUBING (EMT): industry standard thin wall conduit of galvanized steel. All elbows, bends, couplings and similar fittings which are installed as a part of the conduit system must be compatible for use with electric metallic tubing. Couplings and terminating fittings must be of the pressure type as approved by the Commissioner. Set screw fittings will not be acceptable. EMT must meet the requirements of the latest edition, as amended, of the "Standard for Electrical Metallic Tubing" of the Underwriters Laboratories Inc. EMT may only be used where specifically indicated. In no case will EMT be permitted in spaces other than hung ceilings and dry wall partitions.

F. FLEXIBLE METALLIC CONDUIT (FMC): a conduit made through the coiling of a self-interlocking ribbed strip of aluminum or steel, forming a hollow tube through which wires can be pulled. For final connections to motors and motorized equipment, not more than a 4' - 0" length of flexible conduit may be used. For watertight installations, this conduit must be of a watertight type, attached with watertight glands or fittings for final connections from outlet box to recessed lighting fixtures and in locations only where specifically permitted by the Specifications or Contract Drawings.

1.5 PROCEDURE FOR ELECTRICAL APPROVAL:

This Section sets forth General Electrical information, as well as required approvals for all electrical work required for the Project, including ancillary electrical work which may be included in the work of other trade subcontractors.

A. ELECTRIC SERVICE: The electric service supply is subject to commercial and operating variation of the utility company. Proper provision must be made to have all apparatus operate normally under these conditions.

B. ACCEPTANCE: Acceptance and approval of the Work will be contingent upon the inspection and test of the installation by the City regulatory agency.

C. TESTS: The Contractor must notify the Commissioner when the Contractor has completed the work and is ready to have it inspected and tested. Upon completion of the Work, tests must be made as required by the Commissioner of all electrical materials, electrical and associated mechanical equipment, and of appliances installed hereunder. The Contractor must furnish all labor and material for such tests. Should the tests show that any of the material, appliances or workmanship is not first class or not in compliance with the Contract, on written notice the Contractor must remove and promptly replace the materials to be in conformity with the Contract.

D. CERTIFICATE OF THE BUREAU OF ELECTRICAL CONTROL, OF THE DEPARTMENT OF BUILDINGS (B.E.C.): Prior to requesting a substantial completion inspection, the Contractor must file a Certificate of Inspection issued by B.E.C. On completion of the Work, the Contractor must obtain certificates of inspection, approval, acceptance and compliance from all agencies and/or entities having jurisdiction over the work and must deliver these certificates to the Commissioner in accordance with Section 01 77 00 CLOSEOUT PROCEDURES.

E. RESPONSIBILITY FOR CARE AND PROTECTION OF EQUIPMENT:

1. The Contractor furnishing any equipment must be responsible for the equipment until it has been inspected, tested and accepted, in accordance with the requirements of the Contract.

2. After delivery, before and after installation, the Contractor must protect all equipment against theft, injury or damage from all causes. The Contractor must carefully store all equipment received for work which is not immediately installed. If any equipment has been subject to possible injury by water, it must be thoroughly dried out and put through a special dielectric test as directed by the Commissioner, at the expense of the Contractor or replaced by the Contractor without additional cost to the City.

F. UNIFORMITY OF EQUIPMENT: Any two (2) or more pieces of equipment, apparatus or materials of the same kind, type, or classification, which are intended to be used for identical types of service, must be made by the same manufacturer.

1.6 SUBMITTALS:

A. CONTRACTOR'S ELECTRICAL DRAWINGS AND SAMPLES FOR APPROVAL:

1. The Contractor must submit to the Commissioner for approval, in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, complete dimensional drawings of all equipment, wiring diagrams, motor test data, details of control, installation layouts showing all details and locations and including all schedules, and descriptions and supplementary data to comprise complete working drawings and instructions for the performance of the Work. A description of the operation of the equipment and controls must be included. A letter, in triplicate, must accompany each submittal.

2. The Contractor must submit in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, duplicate samples of such materials and appliances as may be requested by the Commissioner for approval. These samples must be properly tagged for identification and submitted for examination and test. After the samples are approved, one (1) sample will be returned to the Contractor and the other sample will be filed in the office of the Commissioner's representative for inspection use. After the Contract is completed, the second set of samples will be returned to the Contractor.

B. TIMELINESS: All material must be submitted in accordance with the Submittal Schedule in sufficient time for the progress of construction. Failure to promptly submit acceptable samples and dimensional drawings of equipment will not be accepted as grounds for an extension of time. The Commissioner may decline to consider submittals unless all related items are submitted at the same time.

C. CONTRACTOR'S STATEMENT WITH SUBMITTALS: Contractor must submit a statement in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.

D. BULLETINS AND INSTRUCTIONS: The Contractor must furnish and deliver to the Commissioner in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS and Section 01 77 00 CLOSEOUT PROCEDURES, after acceptance of the work, four (4) complete sets of instructions, technical bulletins and any other printed matter (diagrams, prints, or drawings) required to provide complete information for the proper operation, maintenance and repair of the equipment and the ordering of spare parts.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 ELECTRICAL INSTALLATION PROCEDURES:

This Sub-Section sets forth the General Installation Procedure that must apply to all electrical work and electrical equipment appearing in the Contract.

(Refer to Sub-Section 1.4 DEFINITIONS for terms used in this section)

A. INTENT OF CONTRACT DOCUMENTS: The Drawings and Specifications are to be interpreted as a means of conveying the scope and intent of the work without giving every minor electrical detail. It is intended, nevertheless, that the Contractor must provide whatever labor and materials are found necessary, within the scope of the Contract, for the successful operation of the installation. Specific details of individual installations are to be finally decided upon when the Contractor submits Working or Shop Drawings for approval to DDC. Whenever there are two (2) or more methods to complete Project work within the Contract scope, the Commissioner reserves the right to choose that method which, in the Commissioner's opinion, will afford the most satisfactory performance, lasting qualities, and access for repairs, even if this selection is the costliest.

B. SCHEMATIC PLANS – APPROXIMATE LOCATIONS: Conduits and wiring are shown on the plans for diagrammatic purposes only. Therefore, conduit layouts may not necessarily give the actual physical route of the conduits. The Contractor who installs a conduit system will also be required, as part of the work, to furnish and install all hangers and pull-boxes, including any special pull-boxes found necessary to overcome interferences, and to facilitate the pulling of electrical cables. Similarly, the locations of equipment, appliances, outlets and other items shown on Contract Drawings are only approximate and are to be definitively established when equipment Shop Drawings are submitted and approved by DDC during construction.

C. SLEEVES: required for conduits passing through walls or floors; must be furnished and set by the Contractor installing the conduits. Sleeves in waterproofed floors must be provided with flashing extending twelve (12) inches in all directions from sleeve and secured to waterproofing. Flashing must be turned down into space between pipe and sleeve and caulked watertight. Flashing must be twenty (20) ounces cold rolled copper. Sleeves must be supplied with welded flanges similar to those supplied by the subcontractor for Plumbing Work and must extend one (1) inch above finished floor.

D. COORDINATION: The Contractor must keep in close touch with the construction progress and promptly obtain the necessary information for the accurate placement of its work well before Project construction operations obstruct its work. The Contractor is to consult all other Contract Drawings, as well as approved equipment Shop Drawings on file in the Resident Engineer's Field Office. This will aid in avoiding interferences, omissions, and errors in the electrical installation.

E. RESTORATION: If drilling or cutting is done on finished surfaces of equipment or the structure, any marring of the surface must be repaired or replaced by the Contractor. The Contractor must be held responsible for corrective restoration due to its cutting or drilling, and for any damage to the Project or its contents caused by the Contractor or the Contractor's workers. If any piercing of waterproofing occurs because of the installation of the work, the Contractor must restore the waterproofing, at its own expense, to the satisfaction of the Commissioner.

F. ELECTRICAL WORK AT SITE: The Contractor furnishing equipment consisting of a number of related electrical devices or appliances, mounted in a single enclosure, or on a common base, must furnish this unit, ready for connection and operation, complete with internal wiring, connections, terminal boxes with

copper connectors and/or lugs and ample electrical leads. The cost of any wiring, re-wiring, or other work required to be done on this unit in the field, must be borne by the Contractor, without additional cost to the City.

G. COOPERATION AMONG SUBCONTRACTORS: Whenever an electrically operated unit or system involves the combined work of several subcontractors for its installation and successful operation, the Contractor must require each subcontractor to exercise the utmost diligence in cooperating with others to produce a complete, harmonious installation.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2

3.2 ELECTRICAL CONDUIT SYSTEM INCLUDING BOXES (PULL, JUNCTION AND OUTLET):

This Sub-Section sets forth the requirements applying to the installation of electrical conduits, boxes or fittings. Rigid steel conduit must be used throughout, unless otherwise directed by the Commissioner. Where the word 'conduit' is used without a modifier such as, rigid steel, EMT, etc., must be interpreted to mean rigid steel, heavy wall, threaded conduit.

(Refer to Sub-Section 1.4 DEFINITIONS for terms used in this section)

A. INSTALLATIONS AND APPLICATIONS:

1. Unless otherwise specified or indicated on the Contract Drawings, conduit runs must be installed concealed in finished spaces.

2. CONDUIT SIZES: The sizes of conduits must be as indicated on the Contract Drawings. Wherever conduit sizes are not indicated, the conduit must meet the requirements of the New York City Electrical Code to accommodate the conductors to be installed therein.

3. Conduits must be reamed smooth after cutting. No running threads will be permitted. Universal type couplings must be used where required. Conduit joints must be screwed up to butt. Empty conduits after installation must have all open ends temporarily plugged to prevent the entrance of water or other foreign matter.

4. Conduits installed in concrete or masonry must be securely held in place during pouring and construction operations. A group of conduits terminating together must be held in place by a template.

5. UNDERGROUND STEEL CONDUITS: Unless otherwise specified, all underground steel conduits in contact with earth must be encased by the Contractor who installs them, in a covering of not less than two (2) inches of an approved concrete mixture. Concrete mix must be one (1) part cement to four and one-half (4 ½) parts of fine and coarse aggregate.

6. EXCAVATION RESTORATION PERMITS: When installing underground conduits, duct banks or manholes, the Contractor must perform the work of cutting pavement, excavation shoring, keeping trenches or holes pumped dry, backfilling, restoration of surfaces to original condition and removal of excess earth and rubbish from premises. During the work, the Contractor must provide adequate crossovers, protective barriers, lamps, flags, etc., to safeguard traffic and the public. When the work is in a public highway or street, the Contractor must secure and pay for all necessary permits, inspection fees, and the cost of repaving.

7. EXPOSED CONDUIT SUPPORTS: Exposed conduits must be supported by Galvanized hangers with necessary inserts, beam clamps of approved design, or attached to walls or ceilings by expansion bolts. Exposed conduits must be supported or fastened at intervals not more than five (5) feet.

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 insure constant calibration and be capable of withstanding excessive short circuit conditions without injury.

9. CONTACTS: must be non-welding under operating conditions and of the silver to silver type.

10. TEMPERATURE RISE: Current carrying parts, except thermal elements, must not rise in temperature in excess of 30 degrees C. while carrying current at the part's rated current and frequency.

11. NUMBERING: Each circuit breaker must be distinctly numbered when installed in a group with other breakers. The calibration of trip element must be indicated on each breaker.

B. SAFETY SWITCHES:

NEMA TYPE HD: When safety switches are permitted to be used for service entrance, motor disconnecting means or to control other types of electrical equipment, they must be of the type HD of a rating not less than 30 Amperes. Enclosures must be provided with means for locking. For ratings above 60 Amperes terminals must have double studs.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.6

3.6 DISTRIBUTION CENTERS:

This Section sets forth the construction and installation procedure for Switchboards, Panel boards and Cabinets.

A. PANEL BOARDS, GENERAL TYPE: The panel boards must be of the automatic circuit breaker type with individual breakers for each circuit, removable without disturbing the other units. Circuit breakers must be in accordance with the requirements outlined under Section 3.5, "Circuit Protective Devices."

B. NUMBER AND RATING OF CIRCUIT BREAKERS: The Contract Drawings show a layout of each panel, giving the number, frame, size and trip setting of circuit breakers and number of branch circuits and spare breakers. Each branch circuit must be distinctly numbered.

C. BUS BAR CONSTRUCTION AND SUPPORT: Panel Boards must be of the dead front type and must have bus bars and branch circuits designed to suit the system and voltage. Current carrying parts, exclusive of circuit breakers, must be copper and based on a maximum density of 1,000 Amperes per square inch. Bus bars for the main switchboard must be designed for the frame rating of the Service Breaker. Bus bars must run up the center of the panel, unless otherwise indicated, and must have connected thereto the various branch circuits. Unless otherwise specified, bus bars for each panel board must be equipped with main lugs only and capacity as required on Contract Drawings. Where main protection is required, automatic circuit breakers must be used. A neutral bus of at least the same capacity as a live bus bar must be provided for the connection of all neutral conductors. Each terminal must be identified. All current carrying parts, exclusive of circuit breakers, must be of copper with a minimum number of joints. The bus bar structure must be a self-supporting unit, firmly fastened to a ½

inch plastic board, extending the full length and width of assembly which must serve to insulate the bus structure from the back of panel box. Other methods affording equally effective bus structure support and insulation will be given consideration. An insulating barrier must separate neutral bus from other parts of panel.

D. CIRCUIT BREAKER ASSEMBLY: The entire circuit breaker and bus bar assembly must be mounted on an adjustable metal base or pan and secured to the back of the panel box. The panel must have edges flanged for rigidity.

E. PANEL MOUNTING: The panel must be centered in the panel box, line up with the door openings, be set level and plumb, and no live parts may be exposed with the door open.

F. PANEL CABINET:

1. PANEL CABINET INSTALLATION: When installed, surface mounted in panel closets must be mounted on Kindorf channel.

2. Where cabinets cannot be set entirely flush due to 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

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SECTION 01 35 26
SAFETY REQUIREMENTS PROCEDURES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. The Contractor shall comply with the requirements of "*The City of New York Department of Design and Construction Safety Requirements".* This document is included in the Information for Bidders.

1.2 SUMMARY:

A. This Section includes administrative and general procedural requirements for Safety and Health Requirements, including:

1. Definitions
2. Required Safety Meeting
3. Compliance with Regulations
4. Submittals
5. Personnel Protective Equipment
6. Hazardous and / or Contaminated Materials
7. Emergency Suspension of Work
8. Protection of Personnel
9. Environmental Protection

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 REQUIRED SAFETY MEETINGS:

A. Prior to commencing construction, the Resident Engineer will schedule and hold a preconstruction kick-off meeting either at DDC's main office or at the Project site with representatives of the Contractor, including the principal on-site project representative, one or more safety representatives, the Commissioner's designated representatives and other concerned parties for the purpose of reviewing the Contract safety requirements. Additionally, implementing Work safety provisions must be discussed.

B. The Contractor is responsible for conducting weekly documented jobsite safety meetings, given to all jobsite personnel including all subcontractors on the Project, with the purpose of discussing safety topics and job-specific requirements at the DDC worksite.

1.5 COMPLIANCE WITH REGULATIONS:

A. The Work, including contact with or handling of hazardous materials, disturbance or dismantling of structures containing hazardous materials, and disposal of hazardous materials, shall comply with the applicable requirement for 29 CFR Parts 1910 and 1926, and 40 CFR, Parts 61, 261, 761 and 763.

B. Work involving disturbance or dismantling of asbestos or asbestos-containing materials, demolition of structures containing asbestos and removal of asbestos, shall comply with 40 CFR Part 61, Subparts A and M, and 40 CFR Part 763, as applicable.

C. Additionally, Work shall comply with all applicable federal, state, and local safety and health regulations.

D. In case of a conflict between applicable regulations, the more stringent requirements shall apply.

E. All workers working on the DDC Project site are required by NYC Local Law 41 to complete the OSHA 10-hour training course.

1.6 SUBMITTALS:

A. The Contractor shall submit to the Resident Engineer, copies of the Safety Program, Site Safety Plan and other required documentation in accordance with the "*New York City Department of Design and Construction Safety Requirements*".

B. Permits: If hazardous materials are disposed of off-site, the Contractor must submit to the Resident Engineer copies of shipping manifests, permits from applicable federal, state, or local authorities and disposal facilities, and certificates that the material has been disposed of in accordance with regulations.

C. Accident Reporting: Submit a copy of each accident report to the Resident Engineer in accordance with the "*New York City Department of Design and Construction Safety Requirements*".

D. All asbestos and lead project regulatory notifications are to be submitted to DDC's Office of Environmental and HazMat Services (OEHS) through the Resident Engineer.

E. Request for Subcontractor Approval: Any subcontractor performing environmental work must submit required documentation for approval to perform such work as required by DDC's OEHS.

PART II – PRODUCTS

2.1 PERSONNEL PROTECTIVE EQUIPMENT:

A. Special facilities, devices, equipment, and similar items used by the Contractor in execution of the Work shall comply with 29 CFR Part 1910, subpart I, Part 1926, subpart E, and other applicable regulations.

2.2 HAZARDOUS AND / OR CONTAMINATED MATERIALS:

A. The Contractor shall bring to the attention of the Commissioner, any material encountered during execution of the Work that the Contractor suspects to be hazardous and / or contaminated.

B. The Commissioner shall determine whether the Contractor shall perform tests to determine if the material is hazardous and / or contaminated. A change to the Contract price may be provided, subject to the applicable provisions of the Contract.

C. If the material is found to be hazardous, the Commissioner may direct the Contractor to remediate the hazard and a change to the Contract price may be provided, subject to the applicable provisions of the Contract.

PART III – EXECUTION

3.1 EMERGENCY SUSPENSION OF WORK:

A. When the Contractor is notified by the Commissioner of noncompliance with the safety provisions of the Contract, the Contractor shall immediately, unless otherwise instructed, correct the unsafe condition, at no additional cost to the City.

B. If the Contractor fails to comply promptly, all or part of the Work may be stopped by notice from the Commissioner.

C. When, in the opinion of the Commissioner, the Contractor has taken satisfactory corrective action, the Commissioner shall provide written notice to the Contractor that the Work may resume.

D. The Contractor shall not be allowed any extension of time or compensation for damages in connection with a work stoppage for an unsafe condition.

3.2 PROTECTION OF PERSONNEL:

A. The Contractor shall take all necessary precautions to prevent injury to the public, occupants, or damage to property of others. The public and occupants includes all persons not employed by the Contractor or a subcontractor.

B. Whenever practical, the work area shall be fenced, barricaded, or otherwise blocked off from the public or occupants to prevent unauthorized entry into the work area, in compliance with the requirements of Section 01 50 00 TEMPORARY FACILITIES, SERVICES AND CONTROLS, and including without limitation, the following:

1. Provide traffic barricades and traffic control signage where construction activities occur in vehicular areas.
2. Corridors, aisles, stairways, doors, and exit ways shall not be obstructed or used in a manner to encroach upon routes of ingress or egress utilized by the public or occupants, or to present an unsafe condition to the public or occupants.
3. Store, position and use equipment, tools, materials, scraps and trash in a manner that does not present a hazard to the public or occupant by accidental shifting, ignition, or other hazardous activity.
4. Store and transport refuse and debris in a manner to prevent unsafe and unhealthy conditions for the public and occupants. Cover refuse containers and remove refuse on a frequent regular basis acceptable to the Resident Engineer. Use tarpaulins or other means to prevent loose transported materials from dropping from trucks or other vehicles.

3.3 ENVIRONMENTAL PROTECTION:

A. Dispose of solid, liquid and gaseous contaminants in accordance with local codes, laws, ordinances and regulations.

B. Comply with applicable federal, state, and local noise control laws, ordinances, and regulations, including but not limited to 29 CFR 1910.95, 29 CFR 1926.52 and NYC Administrative Code Chapter 28 of Title 15.

END OF SECTION 01 35 26

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SECTION 01 35 91
HISTORIC TREATMENT PROCEDURES

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 91

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for the treatment of Landmark Structures and Landmark Quality Structures, as identified in the Addendum. Specific requirements are indicated in other sections of the Specifications.

B. This Section includes, without limitation, the following:

1. Storage and protection of existing historic materials
2. General Protection
3. Protection during use of heat-generating equipment
4. Photographic Documentation
5. NYC Landmarks Preservation Commission Final Approval signoffs

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION
C. Section 01 33 00 SUBMITTAL PROCEDURES
D. Section 01 77 00 CLOSEOUT PROCEDURES
E. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Landmark Structure or Site: Any building or site which has been designated as a landmark, or any building or site within a landmark district, as designated by the New York City (NYC) Preservation Commission or the New York State Historic Preservation Office.

D. Landmark Quality Structure: Any building which has been determined by the City to be of landmark quality and/or historical significance.

E. Preservation: To apply measures necessary to sustain the existing form, integrity, and materials of a historic property. Work may include preliminary measures to protect and stabilize the property.

F. Rehabilitation: To make possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

G. Restoration: To accurately depict the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and the reconstruction of missing features from the restoration period.

H. Reconstruction: To reproduce in the exact form and detail a building, structure, or artifact as it appeared at a specific period in time.

I. Stabilize: To apply measures designed to reestablish a weather-resistant enclosure and the structural reinforcement of an item or portion of the building while maintaining the essential form as it exists at present.

J. Protect and Maintain: To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.

K. Repair: To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Within restoration, repair also includes limited replacement in kind, rehabilitation, and reconstruction, with compatible substitute materials for deteriorated or missing parts of features when there are surviving prototypes.

L. Replace: To duplicate and replace entire features with new material in kind. Replacement includes the following conditions:

1. Duplication: Includes replacing elements damaged beyond repair or missing. Original material is indicated as the pattern for creating new duplicated elements.
2. Replacement with New Materials: Includes replacement with new material when original material is not available as patterns for creating new duplicated elements.
3. Replacement with Substitute Materials: Includes replacement with compatible substitute materials. Substitute materials are not allowed, unless otherwise indicated.

M. Remove: To detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

N. Remove and Salvage: To detach items from existing construction and deliver them to the City ready for reuse.

O. Remove and Reinstall: To detach items from existing construction, repair and clean them for reuse, and reinstall them where indicated.

P. Existing to Remain or Retain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled.

Q. Material in Kind: Material that matches existing materials as much as possible, in species, cut, color, grain, and finish.

1.5 SUBMITTALS:

A. Historic Treatment Program: Submit a written plan for each phase or process, including protection of surrounding materials during operations. Describe in detail materials, methods, and equipment to be used for each phase of the Work.

B. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of the Work, submit for the Commissioner’s approval a written description, including

evidence of successful use on other comparable projects and provide a program of planned testing to demonstrate the effectiveness of the alternative methods and materials for use on this Project.

C. Qualification Data: Submit qualification data for historic treatment specialists as specified and required by individual sections of the Project specifications.

D. Photographs for Designated Landmark Structures: Submit photographs in accordance with Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION and as described in this section.

E. Record Documents: Include modifications to manufacturer's written instructions and procedures, as documented in the historic treatment preconstruction conference and as the Work progresses.

1.6 QUALITY ASSURANCE:

A. Historic Treatment Specialist Qualifications: Refer to Section 01 40 00 QUALITY REQUIREMENTS for Qualifications for Historic Treatment Specialists.

B. Historic Treatment Preconstruction Conference: The Resident Engineer will schedule and hold a preconstruction meeting at the site in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.

1. Review manufacturer's written instructions for precautions and effects of products and procedures on building materials, components, and vegetation.

a. Record procedures established as a result of the review and distribute to affected parties.

1.7 STORAGE AND PROTECTION OF HISTORIC MATERIALS:

A. Removed and Salvaged Historic Materials: As specified and required by individual sections of the Project specifications.

B. Removed and Reinstalled Historic Materials: As specified and required by individual sections of the Project specifications.

C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling during historic treatment. When permitted by the Commissioner, items may be removed to a suitable, protected storage location during historic treatment and reinstalled in their original locations after historic treatment operations are complete.

D. Storage and Protection: When removed from their existing location, store historic materials, at a location acceptable to the Commissioner, within a weather tight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature variations. Secure stored materials to protect from theft.

1. Identify removed items with an inconspicuous mark indicating their original location.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 GENERAL PROTECTION:

A. Comply with manufacturer's written precautions against harmful effects of products and procedures on adjacent building materials, components, and vegetation.

B. Ensure that supervisory personnel are present when work begins and throughout its progress.

C. Temporary Protection of Historic Materials during Construction:

1. Protect existing materials during installation of temporary protections and construction. Do not deface or remove existing materials.

2. Attachments of temporary protection to existing construction must be approved by the Commissioner prior to installation.

D. Protect landscape work adjacent to or within work areas as follows:

1. Provide barriers to protect tree trunks.

2. Bind spreading shrubs.

3. Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than eight (8) hours at a time.

4. Set scaffolding and ladder legs away from plants.

E. Existing Drains: Prior to the start of work or any cleaning operations, test drains and other water removal systems to ensure that drains and systems are functioning properly. Notify the Commissioner immediately of drains or systems that are stopped or blocked. Do not begin Work pertaining to this Section until the drains are in working order.

1. Provide a method to prevent solids, including stone or mortar residue, from entering the drains or drain lines. Clean out drains and drain lines that become blocked or filled by sand or any other solids because of the Work performed under this Contract.

2. Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION DURING USE OF HEAT-GENERATING EQUIPMENT:

A. No roofing work requiring the use of an open flame will be permitted on any Landmark Structure or any Landmark Quality Structure whose roof or wall structure is made of wood or primarily of wood.

B. Comply with the following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used:

1. Obtain Commissioner’s approval for operations involving use of open-flame or welding equipment. Notification must be given for each occurrence and location of work with heat-generating equipment.

2. Where possible, use heat-generating equipment in shop areas or outside the building.

3. Before work with heat-generating equipment commences, furnish personnel to serve as a fire watch (or watches) for location(s) where work is to be performed.

4. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.

5. Remove and keep the area free of combustibles, including rubbish, paper, waste, etc., within the area of operations.

6. If combustible material cannot be removed, provide fireproof blankets to cover such materials.

7. Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks or hot slag into surrounding combustible material.

8. Prevent the extension of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.

9. Inspect each location of the day's work not sooner than thirty (30) minutes after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained.

C. Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to automatic sprinkler heads, shield the individual heads temporarily with guards.

3.3 PHOTOGRAPHIC DOCUMENTATION:

A. Photographs for Designated Landmark Structures: Show existing conditions prior to any historic treatments, including one overall photograph and two close-up photographs of all areas of work affected. Show one overall photograph and two close-up photographs of all areas of work after the successful execution of all historical treatments.

3.4 NEW YORK CITY LANDMARKS PRESERVATION COMMISSION FINAL APPROVALS SIGNOFF:

A. For all projects involving a Landmark Structure or Site, the Contractor, at the completion of the Work, must submit to the Commissioner, in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS, all documentation concerning the successful execution of all historic treatments. This must include, but not be limited to, copies of all before and after photographs of historic treatments, one copy of the Contractor's as-built drawings, copies of testing and analysis results, including cleaning, mortar analysis, pointing mortars and all other information pertaining to work performed under the NYC Landmarks Preservation Commission jurisdiction.

END OF SECTION 01 35 91

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SECTION 01 40 00
QUALITY REQUIREMENTS

PART I– GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes the following:

1. Definitions
2. Engineering Services
3. Conflicting Requirements
4. Quality Assurance
5. Quality Control
6. Approval of Materials
7. Special Inspections (Controlled Inspection)
8. Inspections by Other City Agencies
9. Certificates of Approval
10. Acceptance Tests
11. Repair and Protection

B. This section includes administrative and procedural requirements for quality control to assure compliance with quality requirements specified in the Contract Documents.

C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Documents.

D. Specified tests, inspections, and related actions do not limit Contractor's other quality assurance and quality control procedures that facilitate compliance with the Contract Documents.

E. Provisions of this section do not limit requirements for the Contractor to provide quality assurance and quality control services required by the Commissioner or authorities having jurisdiction.

F. Specific test and inspection requirements are specified in the individual sections of the Specifications.

G. LEED: Refer to the Addendum to identify whether the Project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

H. COMMISSIONING: Refer to the Addendum to identify whether the Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS and/ or Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE. The Contractor must cooperate with the Commissioning Agent and provide whatever assistance is required.

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY

B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION

C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION

D. Section 01 33 00 SUBMITTAL PROCEDURES

E. Section 01 77 00 CLOSEOUT PROCEDURES

F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (Drawings and Specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Commissioning: A Total Quality Assurance process that includes checking the design and installation of equipment, as well as performing functional testing of the same to confirm that the installed equipment is operating and in conformance with the Contract Documents and the City’s requirements.

D. Installer/ Applicator/ Erector: Contractor or another entity engaged by Contractor as an employee or Subcontractor, to perform installation, erection, application, assembly and similar operations.

E. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under sample Submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

F. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

G. Product Tests: Tests and inspections that are performed by a Nationally Recognized Testing Laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

H. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.

I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory means the same as testing agency.

J. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

K. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements.

1.5 ENGINEERING SERVICES

A. Performance and Design Criteria: Where professional design services provided by a professional engineer are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for clarification to the Commissioner.

1.6 CONFLICTING REQUIREMENTS:

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, the Contractor must comply with the most stringent requirement. The Contractor must refer any uncertainties and/or conflicting requirements to the Commissioner for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified must be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. The Contractor must refer any uncertainties to the Commissioner for a decision before proceeding.

1.7 QUALITY ASSURANCE:

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required. Individual Specification Sections may specify supplementary qualification requirements.

1. **Minimum Experience**: Minimum Experience qualification levels as described herein, apply to all entities indicated in the Specification Sections for the Project, unless such entity requires Special Experience requirements per Subsection 1.7 A.2. below. Individual Specification Sections may specify supplementary qualification requirements.

2. **Special Experience**: Special Experience qualification levels as described herein, apply to all entities indicated in the "Special Experience Requirements" page of the PASSPort procurement. Individual Specification Sections may specify supplementary qualification requirements.

B. **Minimum Experience qualification levels:**

1. **Qualifications for Installer or Applicator or Erector**: An entity complying with the requirements of authorities having jurisdiction and having, prior to the bid opening, been regularly engaged for a minimum of three (3) consecutive years in installing, erecting, applying, or assembling work in a timely fashion similar in material, design, and extent to that indicated for the Project, and whose work has resulted in construction with a record of successful in-service performance.

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 projects similar in scope, size, and type to the required work, based on architectural style, construction method and materials and age of building for the project. Entity must provide documentation of having successfully completed a minimum of three (3) projects similar in scope, size and type as required for the Project, and where at least one (1) such prior project of the three (3) must have involved a landmarked building, as officially designated by the City, State, or Federal government.

D. Professional Engineer Qualifications: A professional engineer who is licensed and registered to practice in the State of New York and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for the Project in material, design, and extent.

E. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for the Project.

F. Testing Agency Qualifications: A Nationally Recognized Testing Laboratory (NRTL), a National Voluntary Laboratory Accreditation Program (NVLAP), or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E329 (Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection); and with additional qualifications specified in individual Specification Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

G. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

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 especially manufactured or prepared for use in or part of the permanent construction, such entity will be subject to prior written approval by the Commissioner.

1. NOTICE - The Contractor must give notice in writing to the Commissioner, sufficiently in advance of its intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice must contain a request for inspection, the date of commencement, and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the Commissioner will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials, or the Commissioner will notify the Contractor that the inspection will be made at a point other than the point of manufacture, or the Commissioner will notify the Contractor that inspection will be waived.

J. No Shipping Before Inspection: The Contractor must comply with the foregoing before shipping any material.

K. Certificate of Manufacture: When the Commissioner so requires, the Contractor must furnish to the Commissioner, authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Specifications. These certificates must include copies of the results of physical tests and chemical analyses where necessary, that have been made directly on the product, or on similar products being fabricated by the manufacturer. This may include such approvals as the Bureau of Standards and Appeals (B.S.A.), the Materials and Equipment (M.E.A.) acceptance Index, the Bureau of Electrical Control (B.E.C.), etc.

L. Acceptance: When materials or manufactured products comprise of such quantity that it is not practical to make physical tests or chemical analyses directly on the product furnished, a certificate stating the results of such tests or analyses of similar materials which were concurrently produced may, at the discretion of the Commissioner, be considered as the basis for the acceptance of such material or manufactured product.

M. Testing Compliance: The testing personnel must make the necessary inspections and tests, and the reports thereof must be in such form as will facilitate checking to determine compliance with the Specifications, indicating thereon all analyses and/or test data and interpreted results thereof.

N. Reports: Reports in duplicate must be submitted and authoritative certification thereof must be furnished to the Commissioner as a prerequisite for the acceptance of any material or equipment.

O. Rejections: If, in making any test, it is ascertained by the Commissioner that the material or equipment does not comply with the Specifications, the Contractor will be notified thereof, and will be directed to refrain from delivering said materials or equipment, or to promptly remove it from the site or from the Work and replace it with acceptable material at no additional cost to the City.

P. Furnish Designated Materials: Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Specifications, the Contractor must immediately proceed to furnish the designated material or equipment.

1.9 APPROVAL OF MATERIALS:

A. Local Laws: All materials, appliances and types or methods of construction must be in accordance with the Specifications and must in no event be less than that necessary to conform to the requirements of the New York City (NYC) Construction Codes, Administrative Code and Charter of the City of New York.

B. Approval of Manufacturer: The names of proposed manufacturers, material suppliers, and dealers who are to furnish materials, fixtures, equipment, appliances or other fittings must be submitted to the Commissioner for approval, as early as possible, to afford proper review and analysis. No manufacturer will be approved for any materials to be furnished under the Contract unless it has a plant of ample capacity and have successfully produced similar products. All approvals of materials or equipment that are legally required by the NYC Construction Codes and other governing authorities must be obtained prior to installation.

C. All Materials: Fixtures, fittings, supplies and equipment furnished under the Contract must be new and unused, except as approved by the Commissioner, and of standard first-grade quality and of the best workmanship and design. The City of New York encourages the use of recycled products where practical.

D. INFORMATION TO SUPPLIERS - In asking for prices on materials under any item of the Contract, the Contractor must provide the manufacturer or dealer with such complete information from the Specifications and Contract Drawings as may in any case be necessary, and in every case the Contractor must inform the manufacturer or dealer of all the General Conditions and requirements herein contained.

1.10 SPECIAL INSPECTIONS:

A. SPECIAL INSPECTIONS:

1. Inspection of selected materials, equipment, installation, fabrication, erection, or placement of components and connections made during the progress of the Work to ensure compliance with the Contract Documents and provisions of the NYC Construction Codes, will be made by a Special Inspector. The City of New York will retain the services of the Special Inspector and bear the costs for the performance of Special Inspections in compliance with NYC Construction Codes requirements or as additionally may be called for in the project specifications, except as noted below for Form TR-3: Technical Report for Concrete Design Mix. The Special Inspector will be an entity that is in compliance with the requirements of the NYC Construction Codes. The Contractor must notify the relevant Special Inspector in writing at least 72 hours before the commencement of any Work requiring special inspection.

2. Form TR3: Technical Report Concrete Design Mix: The Contractor will be responsible for, and bear all costs associated with the filing and securing of approvals, if any, for Form TR3: Technical Report Concrete Design Mix, including, but not limited to, engaging the services of a New York City licensed Concrete Testing Lab for the review and approval of concrete design mix, testing, signatures and professional seals, etc., compliant with NYC Department of Buildings requirements, for each concrete design mix.

3. The Contractor must notify the relevant Special Inspector in writing at least 72 hours before the commencement of any Work requiring Special Inspection. The Contractor will be responsible for and bear related costs to assure that all construction or work has suitable access and remains exposed for inspection purposes until the required inspection is completed.

4. Inspections and tests performed under "Special Inspection" will not relieve the Contractor of the responsibility to comply with the Contract Documents, and that there is no warranty given to the Contractor by the City of New York in connection with such inspection and tests or certifications made under "Special Inspections".

5. The Contractor must coordinate with the Resident Engineer or DDC Project Manager to provide access and schedule the Work for inspection by the Special Inspector.

1.11 INSPECTIONS BY OTHER CITY AGENCIES:

A. Letter of Completion: Just prior to Substantial Completion of the Project, the Commissioner will file with the Department of Buildings, an application for a Letter of Completion or a Certificate of Occupancy for the structure.

B. Final Inspections: In connection with the above-mentioned application for a Letter of Completion or a Certificate of Occupancy and before certificates of final payments are issued, the Contractor will be required to arrange for all final inspections by the inspection staff of the Department of Buildings, Fire Department, or other Governmental Agencies having jurisdiction, and secure all reports, sign offs, certificates, etc., by such inspection staff or other governmental agencies, in order that a Letter of Completion or Certificate of Occupancy can be issued promptly.

1.12 CERTIFICATES OF APPROVAL:

A. Responsibility: The Contractor will be responsible for and must obtain all final approvals for the Work installed under the Contract in the form of such certificates that are required by all governmental agencies having jurisdiction over the Work of the Contract.

B. Transmittal: All such certificates must be forwarded to the DDC.

1.13 ACCEPTANCE TESTS:

A. Government Agencies: All equipment and appliances furnished and installed under the Contract must conform to the requirements of the Specifications and will in no event be less than that necessary to comply with the minimum requirements of the law and all of the governmental agencies having jurisdiction.

B. Notice of Tests: Whenever the Specifications and/or any governmental agency having jurisdiction requires the acceptance test, the Contractor will give to all concerned, written notice of the time when these tests will be conducted.

C. Energy: The City will furnish all energy, fuel, water, and light required for tests.

D. Labor and Materials: The Contractor must furnish labor and all other material and instruments necessary to conduct the acceptance tests at no additional cost to the City.

E. Certificates: The Final Acceptance by the Commissioner will be contingent upon the Contractor delivering to the Commissioner all necessary certificates evidencing compliance in every respect with the requirements of the regulatory agencies having jurisdiction.

F. Results: If the results of tests and Special Inspections indicate that the material or procedures do not meet requirements as set forth on the Contract Drawings or in the Specifications or are otherwise unsatisfactory, the Contractor must only proceed as directed by the Commissioner. Additional costs resulting from retesting, re-inspecting, replacing of material and/or damage to the Work and any delay caused to the schedule will be borne by the Contractor.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, the Contractor must repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

END OF SECTION 01 40 00

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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
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
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
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

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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.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B (2)

2. CONNECTION TO EXISTING ELECTRICAL POWER SERVICE:

a. When approved by the Commissioner, electrical power service for the temporary lighting system and for the operation of small tools and equipment less than ¼ horsepower may be taken from the existing electric distribution system if the existing system is of adequate capacity for the temporary power load. The Contractor must cooperate and coordinate with the facility custodian, so as not to interfere with the normal operation of the facility.

b. There will be no charge to the Contractor for the electrical energy consumed.

c. The Contractor must provide, maintain and pay all costs for separate temporary electric power for any temporary power for equipment larger than 1/4 horsepower. When directed by the Commissioner, the Contractor must remove its own temporary power system.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B (3)

3. ELECTRICAL GENERATOR POWER SERVICE:

a. When connection to utility lines or existing facility electric service is not available or is not adequate to supply the electric power need for construction operations, the Contractor must provide self-contained generators to provide power beyond that available.

b. Pay for all energy consumed in the progress of the Work, exclusive of that available from the existing facility or utility company.

c. Provide for control of noise from the generators.

d. Comply with the Ultra Low Sulfur Fuel in Non-Road Vehicles requirements as set forth in Article 5.4 of the Contract.

C. USE OF COMPLETED PORTIONS OF THE ELECTRICAL WORK:

1. USE OF MAIN DISTRIBUTION PANEL: As soon as the permanent electric service feeders and equipment metering equipment and main distribution panel are installed and ready for operation, the Contractor must have the temporary lighting and power system changed over from the temporary service points to the main distribution panel.

2. COST OF CHANGE OVER: The Contractor will be responsible for all costs due to this change over of service and it must also make application to the public utility company for a watt hour meter to be set on the permanent meter equipment.

3. The requirements for temporary electric power service specified herein must be adhered to after change over of service until Final Acceptance of the Project.

4. NO EXTRA COST: The operation of the service and switchboard equipment will be under the supervision of the Contractor, but this will in no way be interpreted to mean the acceptance of such part of the installation or relieve the Contractor from its responsibility for the complete Work or any part thereof. There will be no additional charge for supervision by the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 D

D. TEMPORARY LIGHTING SYSTEM:

1. The Contractor must provide adequate service for the temporary lighting system, or a minimum of one hundred (100) Amperes, 3-phase, 4-wire service for the temporary lighting system, whichever is greater, and make all necessary arrangements with the public utility company and pay all charges by them for the Temporary Lighting System.

2. The Contractor must furnish and connect to the metered service point a Temporary Lighting System to illuminate the entire area where Work is being performed and points adjacent to the Work, with separately fused circuits for stairways and bridges. Control switches for stairway circuits must be located near entrance on ground floor.

3. ITEMS: The Temporary Lighting System provided by the Contractor must consist of wiring, fixtures, left-hand double sockets (one (1) double socket for every 400 square feet, with one (1) lamp and one (1) three-prong outlet), lamps, fuses, locked-type guards, pigtails and any other incidental material. Additional details may be outlined in the detailed Specifications for the electrical Work. Changes may be made, provided the full equivalent of those requirements is maintained.

4. The Temporary Lighting System will be progressively installed as required for the advancement of the Work under the Contract.

5. RELOCATION: The cost for the relocation or extension of the original Temporary Lighting System, as required by the Contractor or its subcontractors, that is not required due to the normal advancement of the Work, as determined by the Resident Engineer, will be borne by the Contractor.

6. PIGTAILS: The Contractor must furnish pigtails with left-hand sockets with locked-type guards and forty (40) feet of rubber covered cable. The Contractor must furnish and distribute a minimum of three (3) complete pigtails to each subcontractor. See the detailed Electrical Specifications for possible additional pigtails required.

7. LAMPS: The Contractor must furnish and install one (1) complete set of lamps, including those for the trailers. Broken and burned out lamps in the temporary lighting system, DDC field office, and construction trailers must be replaced by the Contractor. All lamps must be compact fluorescent.

8. CIRCUIT PROTECTION: The Contractor must furnish and install Ground Fault Interruption (GFI) protection for the temporary lighting and site security lighting systems.

9. MAINTENANCE OF TEMPORARY LIGHTING SYSTEM:

   a. The Contractor must maintain the Temporary Lighting System in good working order during the scheduled hours established.

   b. The Contractor must include in its total Contract price all costs in connection with the Temporary Lighting System, including all costs for installation, maintenance and electric power.

10. REMOVAL OF TEMPORARY LIGHTING SYSTEM: The temporary lighting system must be removed by the Contractor when authorized by the Commissioner.

11. HAND TOOLS: The temporary lighting system must not be used for power purposes, except that light hand tools not larger than 1/4 horsepower may be operated from such system by the Contractor and its subcontractors.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 E

E. SITE SECURITY LIGHTING (NEW CONSTRUCTION ONLY):

1. The Contractor must furnish, install and maintain a system of site security lighting, as herein specified, to illuminate the construction Site of the Project, with the system connected to and energized from the Temporary Lighting System. All costs in connection with site security lighting will be deemed included in the total Contract price.

2. It is essential that the site security lighting system be completely installed and operating at the earliest possible date. The Contractor must direct its subcontractors to cooperate, coordinate and exert every effort to accomplish an early complete installation of the site security lighting system. If, after the system is installed and in operation, a part of the system interferes with the Work of any trade, the Contractor will be completely responsible for the expense of removing, relocating, and replacing all equipment necessary to reinstate the system to proper operating conditions.

3. The system must consist of flood lighting by pole-mounted guarded sealed-beam units. Floodlight units must be mounted sixteen (16) feet above grade. Floodlights must be spaced around the perimeter of the Site to produce an illumination level of no less than one (1) foot candle around the perimeter of the Site, as well as in any potentially hazardous area or any other area within the Site that might be deemed by the Resident Engineer to require security illumination. The system must be installed in a manner acceptable to the Resident Engineer. The first lighting unit in each circuit must be provided with a photoelectric cell for automatic control. The photoelectric cell must be installed as per manufacturer's recommendations.

4. All necessary poles must be furnished and installed by the Contractor.

5. The site security lighting must be kept illuminated at all times during the hours of darkness. The Contractor must, at its own expense, keep the system in operation and must furnish and install all material necessary to replace all damaged or burned out parts.

6. The Contractor must be on telephone call alert for maintaining the system during the operating period stated above.

7. All materials and equipment furnished under this section will remain the property of the Contractor and must be removed and disposed of by the Contractor when authorized in writing by the Resident Engineer.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.5

3.5 TEMPORARY HEAT:

A. GENERAL:

1. Definition: The provision of Temporary Heat means the provision of heat in order to permit construction to be performed in accordance with the Progress Schedule during all seasons of the year and to protect the Work from the harmful effects of low temperature. In the event the building, or any portion thereof, is occupied during construction, the provision of Temporary Heat will include the provision of heat to permit normal operations in such occupied areas.

   a. The provision of Temporary Heat must be in accordance with the temperature requirements set forth in sub-section 3.5 C herein.

   b. The provision of Temporary Heat must include the provision of: 1) all fuel necessary and required, 2) all equipment necessary and required, and 3) all operating labor necessary and

required. Operating labor must mean that minimum force required for the safe day-to-day operation of the system for the provision of Temporary Heat and must include, without limitation, heating maintenance labor and/or fire watch as required by New York City Fire Department (FDNY) regulations. Operating labor may be required seven (7) days per week and during non-regular working hours, for the period of time required by seasonal weather conditions.

c. In the event the building, or any portion thereof, is occupied and the Project involves the replacement, modification, and/or shut down of the permanent heating system, or any key component thereof, and such system is a combined system which furnishes domestic hot water for the building occupants, the provision of Temporary Heat must include the provision of domestic hot water at the same temperature as the system which is being replaced. Domestic hot water must be provided in accordance with the phasing requirements set forth in the Contract Documents.

2. Responsibility: The Contractor's responsibility for the provision of Temporary Heat, including all expenses in connection therewith, is as set forth below:

a. Projects involving enclosure of the building:

1) Prior to Enclosure: Until the Commissioner determines that the building has been enclosed, as set forth in sub-section 3.5 B, the Contractor is responsible for the provision of Temporary Heat.

2) Post Enclosure: Once the Commissioner determines that the building, or any portion thereof, has been enclosed, as set forth in sub-section 3.5 B, the Contractor is responsible for the provision of Temporary Heat by one or more of the following means: 1) by an existing heating system (if any), 2) by a permanent heating system which is being installed as part of the Project, or 3) by a temporary heating system(s).

3) The Contractor must, within two (2) weeks of the kick-off meeting, submit to DDC for review its proposed plan to provide Temporary Heat. Such plan is subject to approval by the Resident Engineer. The Contractor must provide Temporary Heat in accordance with the approved plan until written acceptance by the Commissioner of the Work of all subcontractors, including punch list Work, unless directed otherwise in writing by the Commissioner. The responsibility of the Contractor provided for herein is subject to the exception set forth in sub-section 3.5 A.2 (b) herein.

b. Projects not involving enclosure of the building:

1) If the Project involves the installation of a new permanent heating system if one did not exist previously, or the replacement, modification, and/or shut down of the existing permanent heating system, or any key component thereof, the Contractor will be responsible for the provision of Temporary Heat, except as otherwise provided in sub-section 3.5 H.3(b).2 herein.

2) If the Project does not involve the installation of a new permanent heating system if one did not exist previously, or the replacement, modification, and/or shut down of the existing permanent heating system, or any key component thereof, there is no Contractor responsibility of the provision of Temporary Heat, unless otherwise specified in the Contract Documents. However, if the Commissioner, pursuant to sub-section 3.5 H.3 (b).1 herein, determines that the provision of Temporary Heat is necessary due to special and/or unforeseen circumstances, the Contractor will be responsible for the provision of Temporary Heat and must be paid for the same in accordance with sub-section 3.5 H.3 (b).1 herein.

B. ENCLOSURE OF STRUCTURES:

1. Notification: The Contractor must notify all its subcontractors and the Resident Engineer at least thirty (30) Days prior to the anticipated date that the building(s) will be enclosed.

2. Commissioner Determination: The Commissioner will determine whether the building, or any portion thereof, has been enclosed. As indicated in sub-section 3.5 A.2 above, once the building has been enclosed, the Contractor will be responsible for the provision of Temporary Heat. The Commissioner's determination with respect to building enclosure will be based upon all relevant facts and circumstances, including without limitation, 1) whether the building meets the criteria set forth in Paragraph 3 below, and 2) whether the openings in the building, such as doorways and windows, have been sufficiently covered so as to provide reasonable heat retention and protection from the elements.

3. Criteria for enclosure:

a. Roof Area:

1) A building will be considered to be roofed when the area to be roofed is covered by a permanent structure and all openings through the permanent structure are covered and protected by temporary covers as described in Paragraph (c) below.

2) Intermediate floor structures of multi-floor buildings will be considered to be roofed subject to the same requirements of the building roof.

3) The final roofing system need not be in place for the building or structure to be determined to be enclosed, provided, however, all openings through the permanent structure covering the roof must be covered and protected by temporary covers, as described in Paragraph (c) below.

b. Walls: For the walls to be determined to be enclosed, permanent exterior wall elements or facing material must be in place and all openings must be covered and protected by temporary covers, as described in Paragraph (c) below.

c. Temporary Covers: In order to be acceptable, temporary covers must be securely fixed to prevent the entrance of rain, snow and direct wind. The minimum material requirements for temporary covers are as follows: 1) minimum ten (10) millimeter plastic, 2) minimum twelve (12) ounce waterproof canvas tarpaulins, or 3) a minimum three-eighths (3/8) inch thickness exterior grade plywood.

d. Temporary covers for openings will be the responsibility of the Contractor and such Work will be deemed included in the Contract price.

C. TEMPERATURE REQUIREMENTS:

1. Unoccupied Buildings: The temperature requirement for the provision of Temporary Heat in unoccupied buildings will be the GREATER of the following: 1) fifty (50) degrees Fahrenheit, or 2) the temperature requirement for the particular type of Work set forth in the Contract Documents.

2. Occupied Buildings: The temperature requirement for the provision of Temporary Heat in occupied buildings, or portions thereof, will be the GREATER of the following: 1) sixty-eight (68) degrees Fahrenheit, or 2) the temperature requirement for the particular type of Work set forth in the Contract Documents.

D. DURATION:

1. The Contractor must be required to provide Temporary Heat until Final Acceptance, including all punch list work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. The Contractor must be responsible for the provision of Temporary Heat for the time specified herein, regardless of any delays in completion of the Project, including delays that

result in the commencement of the provision of Temporary Heat during a season that is later than that which may have been originally anticipated. The Contractor must include in its total Contract price all expenses in connection with the provision of Temporary Heat in accordance with the requirements specified herein.

2. The total Contract duration is set forth in Schedule A of the Addendum. The table set forth below indicates the number of full heating seasons that are deemed included in various Contract durations, which are specified in CCDs. At a minimum, a full heating season must extend from October 15th to April 15th.

Contract Duration	Full Heating Seasons Required
up to 360 CCD	1 full heating season
360 to 720 CCD	2 full heating seasons
more than 720 CCD	3 full heating seasons

E. METHOD OF TEMPORARY HEAT:

1. The method of temporary heat must be in conformance with the New York City Fire Code and with all applicable laws, rules, and regulations. Prior to implementation, such method must be subject to the written approval of the Commissioner.

2. The method of temporary heat must:

   a. Not cause the deposition of dirt or smudges upon any finished Work or cause any defacement or discoloration to the finished Work.

   b. Not be injurious or harmful to people or materials.

   c. Portable fueled heating 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.

3. Temporary Heat Allowance for Special Conditions or and/or Unforeseen Circumstances:

a. The City may establish an Allowance in the Contract for payment of costs and expenses in connection with the provision of Temporary Heat as set forth herein. If established, the City will include an amount for such Allowance on the Bid Form, and the Contractor must include such Allowance amount in its total Contract price. The Contractor will only be entitled to payment from this Allowance under the conditions and in accordance with the requirements set forth below. In the event this Allowance or any portion thereof remains unexpended at the conclusion of the Contract, such Allowance must remain the sole property of the City. Should the amount of the Allowance be insufficient to provide payment for the expenses specified below, the City will increase the amount of the Allowance.

b. The Allowance set forth herein may be utilized only under the conditions set forth below.

1. In the event the Project does not involve the installation of a new permanent heating system if one did not exist previously, or the replacement, modification, and/or shut down of the existing permanent heating system, or any key component thereof, and the Commissioner determines that the provision of Temporary Heat is necessary due to special and/or unforeseen circumstances, the Contractor must be responsible for the provision of Temporary Heat, as directed by the Commissioner. The City must pay such Contractor for all costs for labor, material, and equipment necessary and required for the same. Payment must be made in accordance with Article 26 of the Contract, except that the cost of fuel must be as set forth in Paragraph (c) below.

2. In the event the Commissioner determines that there is a need for maintenance of the permanent heating system by the Contractor after Final Acceptance by the Commissioner of the Work, and that the need for such maintenance is not the fault of the Contractor, the Contractor must provide the required maintenance of the permanent heating system for the period of time directed by the Commissioner. The City will pay the Contractor for the cost of direct labor and fuel necessary and required in connection with such maintenance, excluding the cost of any foremen or other supervision. Payment must be made in accordance with Article 26 of the Contract, except that the cost of fuel must be as set forth in Paragraph (c) below.

c. Payment for Fuel Costs: Payment from the Allowance set forth herein for the cost of fuel necessary and required to operate the system for the provision of Temporary Heat, or to maintain the permanent heating system under the conditions set forth in Paragraph b above, must be limited to the direct cost of such fuel. The Contractor will not be entitled to any overhead and/or profit for such fuel costs. In order to receive payment for such fuel costs, the Contractor must present original invoices for the same. DDC reserves the right to furnish the required fuel.

I. RELATED ELECTRICAL WORK:

1. The Contractor must be responsible for providing the items set forth below and must include all expenses in connection with such items in its total Contract price. The Contractor must provide such items promptly when required and must in all respects coordinate its Work with the Work performed by trade subcontractors in order to facilitate the provision of Temporary Heat.

a. The Contractor must provide all labor, materials, equipment and power necessary and required to furnish and maintain any temporary or permanent electrical connections to all equipment specified to be connected as part of the work of the Contractor's Contract.

b. The Contractor must supply and pay for all power necessary and required for the operation of the system for the provision of Temporary Heat and/or the permanent heating system used for Temporary Heat. Such power must be provided by the Contractor for the duration the Contractor is required to provide Temporary Heat, as set forth in sub-section 3.5 D herein.

2. In providing the items set forth in Paragraph 1 above, the Contractor is advised that labor may be required seven (7) days a week and/or during non-regular working hours for the period of time required by seasonal weather conditions.

J. RELATED PLUMBING WORK:

1. The Contractor must be responsible for providing all labor, materials, and equipment necessary and required to furnish and maintain all temporary or permanent connections to all equipment or plumbing outlets specified to be provided as part of the Work of this Contract. The Contractor must include all expenses in connection with such items of Work in its total Contract price. The Contractor must provide such items of Work promptly when required and must in all respects coordinate its Work with the Work performed by trade subcontractors in order to facilitate the provision of Temporary Heat.

2. In the event portions of the permanent plumbing equipment furnished by the Contractor as part of the Work of this Contract are used for the provision of Temporary Heat either during construction or prior to acceptance by the City of the complete plumbing system, the Contractor will be responsible to provide such plumbing equipment to the City in near-perfect condition and must make any repairs required, other than for ordinary wear and tear on the equipment, at the Contractor's expense. The starting date for warranty and/or guarantee period for such plumbing equipment must be the date of Substantial Completion by the City.

3. For Projects requiring the installation of new and/or modified gas service, as well as associated meter installations, the Contractor must promptly perform all required filings and coordination with the utility companies in order to expedite the installation, testing, and approval of the gas service and associated meter(s).

3.6 STORM WATER CONTROL, DEWATERING FACILITIES AND DRAINS:

A. PUMPING:

1. Comply with requirements of authorities having jurisdiction. Maintain Project Site, excavations, and construction free of water. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rainfall.

2. Contractor must furnish and install all necessary automatically operated pumps of adequate capacity with all required piping to run-off agencies, so as to maintain the excavation, cellar floor, pits and exterior depressions and excavations free from accumulated water during the entire period of construction and up to the date of Final Acceptance of Work of the Contract.

3. All pumps must be maintained at all times in proper working order.

4. Dispose of rainwater in a lawful manner that will not result in flooding the Project or adjoining properties nor endanger permanent Work or temporary facilities.

5. Remove snow and ice as required to minimize accumulations.

3.7 TEMPORARY FIELD OFFICE FOR CONTRACTOR:

A. The Contractor must establish a temporary field office for its own use at the Site during the period of construction, at which readily available copies of all Contract Documents must be kept.

B. The field office must be located where it will not interfere with the progress of any part of the Work or with visibility of traffic control devices.

C. CONTRACTOR'S REPRESENTATIVE: There must be a responsible and competent representative of the Contractor in charge of the office who is duly authorized to receive orders and directions and to put them into effect.

D. Arrangements must be made by the Contractor whereby its representative may be readily available by telephone.

E. All temporary structures must be of substantial construction and neat appearance, and must be painted a uniform gray unless otherwise directed by the Commissioner.

F. CONTRACTOR'S SIGN: The Contractor must post and keep posted on the outside of its field office, office, exterior fence, or wall at Site of Work, a legible sign giving the full name of the company, address of the company and telephone number(s) of responsible representative(s) of the firm who can be reached in the event of an emergency at any time.

G. ADVERTISING PRIVILEGES: The City reserves the right to all advertising privileges. The Contractor must not cause any signs of any kind to be displayed at the Site unless specifically required herein or authorized by the Commissioner.

3.8 DDC FIELD OFFICE:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 A

A. OFFICE SPACE IN EXISTING BUILDING:

1. The Resident Engineer will arrange for office space for sole use in the building where Work is in progress. The Contractor must provide and install a lockset for the door to secure the equipment in the room. The Contractor must provide two (2) keys to the Resident Engineer. After completion of the Project the Contractor must replace the original lockset on the door and ensure its proper operation.

2. In addition to equipment specified in sub-section 3.8 D, the Contractor must provide, for exclusive use of the DDC Field Office, the following:

a. Two (2) single pedestal desks, 42” x 32”; two (2) swivel chairs with arms and three (3) side chairs without arms to match desk. Two metal (2) lockers, single units, 15” x 18” x 78” overall including 6” legs. Lockers to have flat key locks with two (2) keys each, General Steel products or approved equal. Two (2) full ball bearing suspension four (4) drawer vertical legal filing cabinets with locks, approximately 52”H x 28 ½”D x 18”W.

b. One (1) 9000 B.T.U air conditioner or as directed by Commissioner. Wiring for the air conditioner must be minimum No. 12 AWG fed from individual circuits in the fuse box.

c. One (1) folding conference table, 96” x 30” and ten (10) folding chairs.

d. Two (2) metal wastebaskets.

e. One (1) fire extinguisher, one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.

f. One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the Project as required.

3. The Contractor must provide one (1) telephone, where directed and must pay all costs for telephone service for calls within the New York City limits for the duration of the Project.

4. All furniture and equipment, except computer equipment specified in sub-section 3.8 D.3, must remain the property of the Contractor.

5. Computer workstation quantities must be provided as specified in sub-section 3.8 B 3-a for DDC Managed Projects, or sub-section 3.8 B 3-b for CM Managed Projects.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 B

B. DDC FIELD OFFICE TRAILER:

1. GENERAL: The Contractor must, for the time frame specified herein, provide and maintain at its own cost and expense a DDC Construction Field Office and all related items as specified herein [hereinafter collectively referred to as the “DDC Field Office”] for the exclusive use of the Resident Engineer. The DDC Field Office must be located at the Project Site and must be solely dedicated to the Project. Provision of the DDC Field Office must commence within thirty (30) Days from Notice to Proceed (NTP) and must continue through forty-five (45) Days after Substantial Completion of the required construction at the Project Site. The Contractor must remove the DDC Field Office forty-five (45) Days after Substantial Completion of the required construction, or as otherwise directed in writing by the Commissioner.

2. TRAILER: The Contractor must provide at its own cost and expense a mobile office trailer for use as the DDC Field Office. The Contractor must install and connect all utility services to the trailer within thirty (30) Days from NTP. The trailer must have equipment in compliance with the minimum requirements hereinafter specified. Any permits and fees required for the installation and use of said trailer must be borne by the Contractor. The trailer including furniture and equipment therein, except computer equipment specified in sub-section 3.8D.3 herein, must remain the property of the Contractor.

3. Trailer must be an office-type trailer of the size specified herein, with exterior stairs at entrance. Trailer construction must be minimum 2 x 4 wall construction fully insulated with paneled interior walls, pre-finished gypsum board ceilings and vinyl tile floors.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8.B.3a or SUB-SECTION 3.8.B.3b.

a. DDC Managed Project Trailer: DDC Field Office Trailer Size, Layout and Computer Workstation:

1) Overall length: 32 Feet
Overall width: 10 Feet

2) Interior Layout:
Provide one (1) general office/conference room area and one (1) private office at one end of the trailer. Provide equipment and amenities as specified in sub-section 3.8.B herein.

3) Computer Workstation: Provide one (1) complete computer workstation and one (1) tablet, as specified in sub-section 3.8.D herein, in the private office area as directed by the Resident Engineer.

b. CM Managed Project Trailer: DDC Field Office Trailer Size, Layout and Computer Workstation:

1) Overall length: 50 Feet
Overall width: 10 Feet

2) Interior Layout:

Provide one (1) large general office/conference room in the center of the trailer and two (2) private offices, one (1) each at either end of the trailer. Provide equipment and amenities as specified in sub-section 3.8.B herein.

3) Computer Workstation:

Provide three (3) complete computer workstations and two (2) tablets as specified in sub-section 3.8.D herein. Provide one (1) each complete computer workstation in each private office and one (1) complete computer workstation at the secretarial position as directed by the Resident Engineer.

4. The exterior of the trailer must be lettered with black block lettering of the following heights with white borders:

CITY OF NEW YORK	2-1/2"
DEPARTMENT OF DESIGN AND CONSTRUCTION	3-3/4"
DIVISION OF PUBLIC BUILDINGS	3-1/2"
DDC FIELD OFFICE	2-1/2"

NOTE: In lieu of painting letters on the trailer, the Contractor may substitute a sign constructed of a good quality weatherproof material with the same type and size of lettering above.

5. All windows and doors must have aluminum insect screens. Provide wire mesh protective guards at all windows.

6. The interior must be divided by partitions into general and private office areas as specified herein. Provide a washroom located adjacent to the private office and a built-in wardrobe closet opposite the washroom. Provide a built-in desk in the private office(s) with fixed overhead shelf and clearance below for two (2) file cabinets.

7. Provide a built-in drafting or reference table, located in the general office/conference room, at least sixty (60) inches long by thirty-six (36) inches wide with cabinet below and wall type plan rack at least forty-two (42) inches wide.

8. The washroom must be equipped with a flush toilet, wash basin with two (2) faucets, medicine cabinet, complete with supplies and a toilet roll tissue holder. Plumbing and fixtures must be approved house type, with each appliance trapped and vented and a single discharge connection. Five (5) gallon capacity automatic electric heater for domestic hot water must be furnished.

9. HVAC: The trailer must be equipped with central heating and cooling adequate to maintain a temperature of seventy-two (72) degrees during the heating season and seventy-five (75) degrees during the cooling season when the outside temperature is five (5) degrees F. winter and eighty-nine (89) degrees F. summer.

10. Lighting must be provided via ceiling mounted fluorescent lighting fixtures to a minimum level of fifty (50) foot candles in the open and private office(s) along with sufficient lighting in the washroom. Broken and burned out lamps must be replaced by the Contractor. A minimum of four (4) duplex convenience outlets must be provided in the open office and two (2) each in the private office(s). These outlets must be in addition to special outlet requirements for computer stations, copiers, HVAC unit, etc.

11. Electrical service switch and panel must be adequately sized for the entire trailer load. Provide dedicated circuits for HVAC units, hot water heater, copiers and other equipment as required. All wiring and installation must conform to the New York City Electrical Code.

12. The following movable equipment must be furnished:

    a. Two (2) single pedestal desks, 42" x 32"; two (2) swivel chairs with arms and three (3) side chairs without arms to match desk. Two (2) full ball bearing suspension four (4) drawer vertical legal filing cabinets with locks and two (2) full ball bearing two (2) drawer vertical legal filing cabinets in each private office located below built-in desk.

    b. One (1) folding conference table, 96” x 30” and ten (10) folding chairs.

    c. Three (3) metal wastebaskets.

    d. One (1) fire extinguisher one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.

    e. One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the Contract as required.

13. TRAILER TEMPORARY SERVICE: Plumbing and electrical Work required for the trailer will be furnished and maintained as below.

    a. PLUMBING WORK: The Contractor must provide temporary water and drainage service connections to the DDC Field Office trailer for a complete installation. Provide all necessary soil, waste, vent and drainage piping.

       Contractor to frost-proof all water pipes to prevent freezing.

       1) REPAIRS, MAINTENANCE: The Contractor must provide repairs for the duration of the Project until the trailer is removed from the Site.

       2) DISPOSITION OF PLUMBING WORK: At the expiration of the time limit set forth in sub-section 3.8 B 1 herein, the temporary water and drainage connections and piping to the DDC Field Office trailer must be removed by the Contractor and must be plugged at the mains. All piping must become the property of the Contractor for plumbing Work and must be removed from the Site, all as directed. All repair Work due to these removals must be the responsibility of the Contractor.

    b. ELECTRICAL WORK:

       1) The Contractor must furnish, install and maintain a temporary electric feeder to the

DDC Field Office trailer immediately after it is placed at the job Site.

2) The temporary electrical feeder and service switch/fuse must be adequately sized based on the trailer load and installed per the New York City Electrical Code and complying with utility requirements.

3) Make all arrangements and pay all costs to provide electric service.

4) The Contractor must pay all costs for current consumed and for maintenance of the system in operating condition, including the furnishing of the necessary bulb replacements lamps, etc., for the duration of the Project and for a period of forty-five (45) Days after the date of Substantial Completion.

5) Disposition of Electric Work: At the expiration of the time limit set forth, the temporary feeder, safety switch, etc., must be removed and disposed of as directed.

6) All repair Work due to these removals must be the responsibility of the Contractor.

c. MAINTENANCE:

1) The Contractor must provide and pay all costs for regular weekly janitor service and furnish toilet paper, sanitary seat covers, cloth towels and soap and maintain the DDC Field Office in first-class condition, including all repairs, until the trailer is removed from the Site.

2) Supplies: The Contractor must be responsible for providing (1) all office supplies, including without limitation, pens, pencils, stationery, filtered drinking water and sanitary supplies, and (2) all supplies in connection with required computers and printers, including without limitation, an adequate supply of blank CD's/DVD's, storage boxes for blank CDs/DVDs, and paper and toner cartridges for the printer.

3) Risk of Loss: The entire risk of loss with respect to the DDC Field Office and equipment must remain solely and completely with the Contractor. The Contractor must be responsible for the cost of any insurance coverage determined by the Contractor to be necessary for the field office.

4) At forty-five (45) Days after the date of Substantial Completion, or sooner as directed by the Commissioner, the Contractor must have all services disconnected and capped to the satisfaction of the Commissioner. All repair Work due to these removals must be the responsibility of the Contractor.

d. TELEPHONE SERVICE: The Contractor must provide and pay all costs for the following telephone services for the DDC Field Office trailer:

1) Separate telephone lines for one (1) desk phone in each private office.

2) One (1) wall phone (with six (6) foot extension cord) at plan table.

3) Separate telephone lines for the fax machine and internet access in each private office. Telephone service must include voice mail. All electronic voicemail messages must be automatically forwarded as email attachments, to allow for the voicemails to be played remotely.

4) A remote bell located on outside of trailer

5) The telephone service must continue until the trailer is removed from the Site.

e. PERMITS: The Contractor must make the necessary arrangements and obtain all permits and pay all fees required for this Work.

C. RENTED SPACE: The Contractor has the option of providing, at its cost and expense, rented office or store space in lieu of trailer. Said space must be in the immediate area of the Project and have adequate plumbing, heating and electrical facilities. Space chosen by the Contractor for the DDC Field Office must be approved by the Commissioner before the area is rented. All insurance, maintenance and equipment, including computer workstations specified in sub-section 3.8 D in quantities required as specified in sub-section 3.8 B 3 for the DDC Field Office trailer, must also apply to rented spaces.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 D

D. ADDITIONAL EQUIPMENT FOR THE DDC FIELD OFFICE:

1. Photocopying Machine: Stand-alone, heavy duty, electric, dry-process color photocopying type with color scan and send capability via email, a minimum production rate of seventy (70) pages per minute and an adequate supply of copy paper, toner, etc. The machine must be capable of duplex copying paper sizes of 8-1/2 x 11 inches, 8-1/2 x 14 inches and 11 x 17 inches, and have separate trays for each paper size. It must have a document feeder, collator, stapler, and the capability to reduce/enlarge copies between each paper size. The supply of each size copy paper, toner, etc. must be replenished and the machines must be maintained for the duration of the Contract by the Contractor as required by the Resident Engineer. Make and model can be Minolta, Canon, IBM, Epson, or an approved equivalent, and must be networked to the office computers for printing capability. Copier must remain at job Site until the DDC Field office trailer is removed from the Site.

2. The Contractor must furnish a fax machine and a telephone answering machine at commencement of the Project for the exclusive use of the DDC Field Office. All materials must be new, sealed in manufacturer's original packaging and must have manufacturers' 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 https://hallways.cap.gsa.gov/)

         (a) Computer type for Personal Computers to be “Desktop Small Form Factor.” Computer type for tablet to be “Tablet”
         (b) The following components listed as optional in the GSA specification must be provided with each personal computer: monitor, speakers, optical drive, smart card reader, webcam, and headset.
         (c) The following additional software must be provided with licenses for each computer:
            1. Adobe Acrobat Pro DC or Bluebeam Revu
            2. Microsoft Office Professional
            3. Autodesk AutoCAD LT
            4. Anti-virus software

5. Microsoft Visio (only one license required per field office)

4) DDC Field Office Specs: DDC Field Offices requiring computers must be provided with the following:

a) One (1) broad-band internet service account. See table below for minimum required upload and download speeds. Telephone service should be bundled together with Internet connectivity. Because of throughput requirements Verizon FIOS is the preferred connectivity provider where available.

Office Personnel #	Download Speeds (*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.

3.9 MATERIAL SHEDS:

A. Material sheds used by the Contractor for the storage of its materials must be kept at locations which will not interfere at any time with the progress of any part of the Work or with visibility of traffic control devices.

B. The Contractor must store combustible materials apart from the facility.

3.10 TEMPORARY ENCLOSURES:

A. The Contractor must provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.

B. Where heating or cooling is needed and Permanent Enclosure is not complete, the Contractor must insulate temporary enclosures.

3.11 TEMPORARY PARTITIONS:

A. The Contractor must provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate occupied tenant areas from fumes and noise, including, but without limitation:

1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.

2. Construct dustproof partitions with 2 layers of 3-mil (0.07-mm) polyethylene sheet on each side. Cover floor with two (2) layers of 3-mil (0.07-mm) polyethylene sheet, extending sheets eighteen (18) inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant plywood.

a. Construct vestibule and airlock at each entrance through temporary partition with not less than forty-eight (48) inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.

3. Insulate partitions to provide noise protection to occupied areas.

4. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.

5. Protect air-handling equipment.

6. Weather strip openings.

7. Provide walk-off mats at each entrance through temporary partition.

3.12 TEMPORARY FIRE PROTECTION:

A. The Contractor must install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with National Fire Protection Association (NFPA) Standard 241.

B. Smoking in all areas is prohibited.

C. The Contractor must supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.

D. The Contractor must develop and supervise an overall fire-prevention and protection program for personnel at Project Site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

E. The Contractor must provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.13

3.13 WORK FENCE ENCLOSURE:

A. The Contractor must furnish, erect and maintain a wood construction or chain-link fence to the extent shown on the Contract Drawings or required by the Work enclosing the entire Project on all sides. All materials used must be new. Any permit required for the installation and use of said fence and costs must be borne by the Contractor.

B. WOOD FENCE must be seven (7) feet high with framing construction of yellow pine, using 4" x 4" approved preservative-treated posts on not more than 6'-0" centers, with three (3) rails of at least 2" x 4" size to which must be secured minimum 1/2 inch thick exterior grade plywood. Posts must be firmly fixed in the ground at least 30" and thoroughly braced. Top edge of fence must be trimmed with a rabbeted edge mould. Provide on the street traffic sides of fence, observation openings as directed.

1. GATES: The Contractor must provide an adequate number of double gates, complete with hardware, located as approved by the Resident Engineer. Double gates must have a total clear opening of 14'-0" with two (2) 7'-0" hinged swinging sections. Hanging posts must be 6" x 6" and must extend high enough to receive and be provided with tension or sag rods for the swinging sections.

2. PAINTING: The fence and gates must be entirely painted on the street and public sides with one (1) coat of exterior primer and one (1) top coat of exterior grade acrylic-latex emulsion paint. Black stenciled signs reading "POST NO BILLS" must be painted on fence with three (3) inch high letters on twenty-five (25) foot spacing for the entire length of fence on street traffic sides. Signs must be stenciled five (5) feet above the sidewalk.

C. CHAIN-LINK FENCING must be minimum two (2) inch thick, galvanized steel, chain-link fabric fencing; eight (8) feet high with galvanized steel pipe posts; minimum 2-3/8-inch Outside Diameter (OD) line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Fence must be accurately aligned and plumb, adequately braced and complete with gates, locks and hardware as required. Under no condition must fencing be attached or anchored to existing construction or trees.

D. ADDITIONAL REQUIREMENTS:

1. It must be the obligation of the Contractor to remove all posters, advertising signs, and markings, etc., immediately.

2. Should the fencing be required to be relocated during the course of the Contract, it must be done by the Contractor at no additional cost to the City.

3. Where sidewalks are used for "drive over" purposes for Contractor vehicles, a suitable wood mat or pad must be provided for protection of sidewalks and curbs.

4. Where required, make provision for fire hydrants, lampposts, etc.

E. REMOVAL: When directed by the Resident Engineer, the fence must be removed.

3.14 RODENT AND INSECT CONTROL:

A. DESCRIPTION: The Contractor must provide all labor, materials, plant and equipment, and incidentals required to survey and monitor rodent activity and to control any infestation or outbreak of rodents, rats, mice, water beetles, roaches and fleas within the Project area. Special attention should be paid to the following conditions or areas:

1. Wet areas within the Project area, including all temporary structures.
2. All exterior and interior temporary toilet structures within the Project area.
3. All Field Offices and shanties within the Project area of all subcontractors and DDC.
4. Wherever there is evidence of food waste and/or discarded food or drink containers, in quantity, that would cause breeding of rodents or the insects herein specified.
5. Any other portion of the Site requiring such special attention.

B. MATERIALS:

1. All materials must be approved by the New York State Department of Environmental Conservation (DEC) and comply with the New York City Health Code, OSHA and the laws, ordinances and regulations of state and federal agencies pertaining to such chemical and/or materials.

C. PERSONNEL:

1. All pest control personnel must be supervised by an exterminator licensed in categories 7A and 8.

D. METHODS:

1. Application and dosage of all materials must be done in strict compliance with the manufacturer's recommendations.
2. Any unsanitary conditions, such as uncollected garbage or debris, resulting from all Contractor's activities, which will provide food and shelter to the resident rodent population must be corrected by the Contractor immediately after notification of such condition by the Resident Engineer.

E. RODENT CONTROL WORK:

1. In wetlands, woodlands, and areas adjacent to a stream, special precautions must be taken to protect water quality and to ensure the safety of other wildlife. To prevent poisoned bait from entering streams, no poisoned bait must be used in areas within seventy-five (75) feet of all stream banks. Live traps must be used in these seventy-five (75) foot buffer zone areas and within wetland and woodland areas.
2. In areas outside the seventy-five (75) foot zone of protection adjacent to streams, and in areas outside wetlands and woodlands, tamper proof bait stations with poisoned bait must be placed during the period of construction and any consumed or decomposed bait must be replenished as directed.
3. At least one (1) month prior to initiation of the construction Work, and periodically thereafter, live traps and/or rodenticide bait in tamper proof bait stations, as directed above, must be placed at locations that do not allow access to pets, human beings, children and other non-target species, particularly wildlife (for example-birds) in the Project area.
4. The Contractor must be responsible for collecting and disposing of all trapped and poisoned rodents found in live traps and tamper-proof bait stations. The Contractor must also be responsible for posting and maintaining signs announcing the baiting of each particular location.
5. The Contractor must be responsible for the immediate collection and disposal of any visible rodent remains found on streets or sidewalks within the Project area.

6. It is anticipated that public complaints will be addressed to the Commissioner. The Contractor, where directed by the Commissioner, must take appropriate actions, like baiting, trapping, proofing, etc., to remedy the source of complaint within the next six (6) hours of normal working time which is defined herein for the purposes of this section as 7 A.M. to 6 P.M. on Mondays through Saturdays.

7. Emergency service during the regular workday hours (Monday through Friday) must be rendered within twenty-four (24) hours, if requested by the Commissioner, at no additional cost to the City.

F. EDUCATION & NOTICES:

1. The Contractor must post notices on all Construction Bulletin Boards advising workers, employees, and residents to call the DDC Field Office to report any infestation or outbreak of rodents, rats, mice, water beetles, roaches and fleas within the Project area. The Contractor must provide and distribute literature pertaining to Integrated Pest Management (IPM) techniques of rodent control to affected businesses and superintendents of nearby residential buildings to ensure their participation in maintaining their establishments free of unsanitary conditions, harborage removal and rodent proofing.

2. Prior to application of any chemicals, the Contractor must furnish to the Commissioner copies or sample labels for each pesticide, antidote information, and Material Data Safety Sheets (MSDS) for each chemical used.

G. RECORDS

1. The Contractor must keep a record of all rodent and waterbug infestation surveys conducted and make available, upon request, to the Commissioner. The findings of each survey must include, but not be limited to, recommended IPM techniques, like baiting, trapping, proofing, etc., proposed for rodent and waterbug pest control.

2. The Contractor must maintain records of all locations baited along with the type and quantity of rodenticide and insecticide bait used.

3.15 PLANT PEST CONTROL REQUIREMENTS AND TREE PROTECTION REQUIREMENTS:

A. Plant Pest Control Requirements: The Contractor and its subcontractors, including the Certified Arborist described below, must comply with all federal and New York State laws and regulations concerning Asian Longhorned Beetle (ALB) management, including protocols for ALB eradication and containment promulgated by the New York State Department of Agriculture and Markets (NYSDAM). The Contractor is referred to: (1) Part 139 of Title 1 NYCRR, Agriculture and Markets Law, Sections 18, 164 and 167, as amended, and (2) State Administrative Procedure Act, Section 202, as amended.

1. All tree Work performed within the quarantine areas must be performed by NYSDAM certified entities. Transportation of all host material, living, dead, cut or fallen, inclusive of nursery stock, logs, green lumber, stumps, roots, branches and debris of a half inch or more in diameter from the quarantine areas is prohibited unless the Contractor or its subcontractor performing tree Work has entered into a compliance agreement with NYSDAM. The terms of said compliance agreement must be strictly complied with. Any host material so removed must be delivered to a facility approved by NYSDAM. For the purpose of this Contract, host material must be ALL species of trees.

2. Any host material that is infested with the ALB must be immediately reported to NYSDAM for inspection and subsequent removal by either State or City contracts, at no cost to the Contractor.

3. Prior to commencement of tree Work, the Contractor must submit to the Commissioner a copy of a valid ALB compliance agreement entered into with NYSDAM and the Contractor or its subcontractor performing tree Work. If any host material is transported from the quarantine area the Contractor must immediately provide the Commissioner with a copy of the New York State 'Statement of Origin and Disposition' and a copy of the receipt issued by the NYSDAM approved facility to which the host materials are transported.

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 which is a regular working day for a majority of the trade

subcontractors. This exception during the working day must not apply after the finishing painting of the plaster Work is commenced; thereafter, not less than one (1) security guard must be on duty continuously, twenty-four (24) hours a day.

2. Every security guard must be required to hold a "Certificate of Fitness" issued by FDNY. Every security guard must, during his/her tour of duty, perform the duties of fire guard in addition to his/her security obligations.

3. Should the Commissioner find that any security guard is unsatisfactory, such guard must be replaced by the Contractor upon the written demand of the Commissioner.

4. Each security guard furnished by the Contractor must be instructed by the Contractor to include in his/her duties the entire construction Site including the Field Office, temporary structures, and equipment, materials, etc.

5. Should the Contractor or any other subcontractor consider the security requirements outlined above inadequate, the Contractor must provide such additional security as it thinks necessary, after obtaining the written consent of the Commissioner. The additional cost of such approved increased protection will be paid by the Contractor.

6. Nothing contained in this sub-section must diminish in any way the responsibility of the Contractor and each subcontractor for its own Work, materials, tools, equipment, nor for any of the other risks and obligations outlined hereinbefore in this Article.

B. COSTS: The Contractor must employ security guards/fire guards throughout the specified time period, except as otherwise modified by the detailed Specifications and as approved by the Commissioner, for the purpose of safeguarding and protecting the Site. All costs for security guards/fire guards must be borne by the Contractor.

C. RESPONSIBILITY: The Contractor and its subcontractors will be responsible for safeguarding and protecting their own work, materials, tools and equipment.

3.19 SAFETY:

A. The Contractor, in compliance with requirements of Section 01 35 26, SAFETY REQUIREMENTS PROCEDURES, must provide and maintain all necessary temporary closures, guard rails, and barricades to adequately protect all workers and the public from possible injury. Any removal of these items, during the progress of the Work, must be replaced by the Contractor at no additional cost to the City.

END OF SECTION 01 50 00

SECTION 01 54 11
TEMPORARY ELEVATORS AND HOISTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:
   1. Temporary Use, Operation and Maintenance of Elevators during Construction
      a. For new buildings up to and including fifteen (15) stories
      b. For new buildings over fifteen (15) stories
      c. For existing buildings
   2. Temporary Construction Hoists and Hoistways (For Material and Personnel)

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY

B. Section 01 42 00 REFERENCES

C. Section 01 50 00 TEMPORARY FACILITIES AND CONTROLS

D. Section 01 54 23 TEMPORARY SCAFFOLDS AND SWING STAGING

E. Section 01 77 00 CLOSE OUT PROCEDURES

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.1

3.1 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR NEW BUILDINGS UP TO AND INCLUDING FIFTEEN (15) STORIES:

A. INSTALLATION: The Contractor must install, complete, operate, and maintain in good working order, as indicated herein, one (1) selected main elevator for the transport of employees of the Contractor and/or its subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of Work at the Project. The Contractor must furnish, install, and maintain such elevator in good working order, including all necessary hoisting ropes, governor cables, traveling conductor cables, operating devices, temporary hand reset target annunciators, temporary signal devices, and all other permanent or temporary parts. The installation, operation and maintenance of the temporary elevator and all equipment and/or parts utilized in connection therewith must be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use.

B. RESPONSIBILITY: The Contractor must be responsible for any injury to persons or damage to property arising out of the temporary elevator and all equipment and/or parts utilized in connection therewith.

C. COSTS: The Contractor must be responsible for all costs in connection with the temporary elevator, including without limitation:

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 (12^{th}) 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 (12^{th}) 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 (12^{th}) 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 (11^{th}) 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 (9^{th}) 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 (12^{th}) 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

(No Text on This Page)

SECTION 01 54 23
TEMPORARY SCAFFOLDING AND PLATFORMS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. SECTION 01 35 26 SAFETY REQUIREMENTS PROCEDURES.

C. The Contractor must comply with the requirements of "*The City of New York Department of Design and Construction Safety Requirements".* This document is included in the Information for Bidders.

1.2 SUMMARY:

A. This Section includes administrative and general procedural requirements for Temporary Scaffolding and Platforms, including:

1. Conformance
2. Responsibility
3. Jobsite Documentation and Submittals
4. Inspections

B. This Section governs ALL scaffold used on DDC Project site(s), including but not limited to, Suspended Scaffold, Supported Scaffold, and Sidewalk Sheds.

1.3 CONFORMANCE:

A. Unless otherwise indicated, the Contractor is responsible for providing, erecting, installing, and maintaining all temporary scaffolding and platforms which must comply with requirements of Chapter 33 (Safeguards During Construction or Demolition) of the New York City (NYC) Building Code, NYC Local Law 52 of 2005, OSHA Construction Standard 1926 Subpart L, and furnishing the items and personnel set forth in this Section.

1.4 RESPONSIBILITY:

A. Jobsite Safety Coordinator: The Contractor must designate and employ a Jobsite Safety Coordinator, who must be a competent person, who must have a daily presence on the Project site during scaffold use. This designee must possess and maintain a valid New York City Department of Buildings (DOB) supported scaffold certificate of completion. An alternate must also be designated in the event that the Jobsite Safety Coordinator is absent. The Jobsite Safety Coordinator must:

1. Verify completeness of documentation and submittals (as described below);
2. Verify that inspections are performed, including pull tests (see below), reports are filed and reported deficiencies are corrected;
3. Monitor trades using scaffold;
4. Limit access to scaffold areas that are tagged for non-use;
5. Inform trades of scaffold load limitations;
6. Monitor loading of decks;
7. Verify that any ties that are temporarily removed are properly restored in the same shift;
8. Verify that outriggers and planks that are moved are properly set up and secured;
9. Verify that all scaffold decks in use have proper access/egress;
10. Verify that all open sides of decks in excess of 14 inches have proper guardrails and toe-boards;

11. Notify appropriate parties, including but not limited to the Resident Engineer, Site Safety Coordinator / Monitor, Site Safety consultant, scaffold users, Contractor and the Scaffold Engineer, of misuses, non-conformances, hazards and accidents; and,
12. Keep a log of significant actions and events connected with the scaffolding.

B. The Contractor will be responsible for erecting, maintaining, and dismantling the scaffolding and/or sidewalk shed in conformance with requirements of the NYC Building Code, OSHA and the Contract Documents, including the Specifications. The Contractor must also be guided by generally accepted standards of scaffold industry practice as promulgated by the Scaffold Industry Association.

C. The Contractor must require the subcontractor responsible for erecting the scaffolding to engage a Scaffold Engineer, licensed as a professional engineer by the State of New York. The Scaffold Engineer will be responsible to ensure the following: (1) that the installation design is in compliance with requirements of the NYC Building Code and OSHA, (2) that the design comports with the capabilities of the components and the characteristics of the site, (3) that scaffold loads on the host building, including netting, have been properly considered, and (4) that the design documents provide accurate information for erectors and users.

D. Scaffold users are trade contractors assigned to work on the scaffold. Training certificates from a DOB-approved training provider are mandatory. These users have a duty to become familiar with the NYC Building Code and OSHA requirements germane to users, to obey the instructions of the Jobsite Safety Coordinator, and to inform the Jobsite Safety Coordinator of known hazards, non-conformances, or violations.

1.5 JOBSITE DOCUMENTATION AND SUBMITTALS:

The Contractor must prepare, obtain, and submit the following to the Resident Engineer:

A. NYC DOB permit(s) for scaffold and sidewalk sheds (as applicable) including filing applications signed and sealed by a Professional Engineer licensed in the State of New York;

B. Site logistics plan / site safety plan;

C. Installation drawing(s), design, and product data to be provided for **all** scaffold(s) and shed(s) must include, at a minimum:

1. Plan(s);
2. Elevation(s);
3. Duty load designation: “standard” (150 psf live load) or “heavy duty” (300 psf live load);
4. Details including base support, anchors and ties;
5. Notes and specifications including load limits, number of planked levels, tie spacing, netting, and sequence of installation and removal;
6. Anchorage into sound material;
7. Load limits based on pull tests;
8. Specifications for pull test(s), method, proof load and the number of trials;
9. Elevations, levels or heights, where anchorage is made into masonry;
10. Specifications for frames, planks, screw jacks, anchors, and any other ancillary hardware;
11. Samples for anchors, ties and netting;
12. Sequence of operations for erection and demolition;
13. Location plan, heights, widths, “jumps” over doorways and driveways;
14. Specify size, maximum span and maximum spacing of headers and stringers;
15. Specify legs, girts, braces, nailing and connections; and,
16. All sidewalk sheds must be designed, engineered, signed, and sealed by a Professional Engineer licensed in the State of New York;
    a. Generic (not job-specific) engineering drawings are satisfactory for standard sheds and arrangements.

b. Special engineering is required for custom sheds, site-specific problems or non-standard arrangements.

1.6 INSPECTIONS:

A. Signed inspection reports must be issued for each inspection and pull-test below, and must be logged and maintained on site by the Jobsite Safety Coordinator for the duration of the Project.

B. Pull testing will be required during design, and during or post erection, where anchorage is made into masonry. The Scaffold Engineer must specify the test method, proof load, and the number of trials.

C. Sidewalk sheds must be inspected after initial installation, major modification, or damage and thence every three months. Inspections must be by a Scaffold Engineer for custom sheds and by a Competent Person employed by the Contractor for standard sheds.

D. Scaffolds must be inspected by the Scaffold Engineer during erection, post-erection, and prior to use and thence every three (3) months. The Scaffold Engineer must repeat inspections after major alteration/ modification, and/or damage.

E. A Qualified Person assigned by the Contractor must inspect: the progress of erection and dismantling; and, the condition and integrity of the sidewalk sheds after high winds, major storms, and at least once per month during usage.

F. A Qualified Person assigned by the Contractor must inspect: the progress of erection and dismantling at least weekly; and, the condition and integrity of the scaffold after high winds, major storms, and at least once per month during usage.

G. Scaffolds and Sidewalk Sheds must be inspected daily by the Jobsite Safety Coordinator or alternate, prior to use by scaffold users. The inspection results must be recorded in the maintenance log and must always be available on-site.

H. At the completion of the Project, submit all inspection documents as Miscellaneous Record Documents in accordance with SECTION 01 78 39 CONTRACT RECORD DOCUMENTS.

1.7 LADDERS AND STAIRS:

A. The Contractor must provide and maintain ladders or temporary stairs extending from the street to the first story, and to and from every floor and roof level of the Project.

1.8 ACCESS AND EXITS:

A. The ladders or temporary stairs must be of acceptable size, number and location, so that proper and convenient access may be had by those required to proceed to and from all parts of the Project.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 54 23

(No Text on This Page)

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 RELATED SECTIONS:

A. Section 01 42 00 REFERENCES for applicable industry standards for products specified.

1.4 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved by Commissioner through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics are listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure.

1.5 ACTION SUBMITTALS

A. Product Specification Submittals: Comply with requirements in Section 01 33 00 SUBMITTAL PROCEDURES. Show compliance with requirements.

B. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Review Action: If necessary, Commissioner will request additional information or documentation for evaluation and will notify Contractor of approval or rejection of proposed comparable product request.

    a. Format of Approval of Submittal: Per Article 1.6 of Section 01 33 00 SUBMITTAL PROCEDURES.
    b. Use product specified, or products by Manufacturers specified if Commissioner does not issue a decision on use of a comparable product request.

1.6 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:

    a. Name of product and manufacturer.
    b. Model and serial number.
    c. Capacity.
    d. Speed.
    e. Ratings.

3. See individual identification sections in Divisions 21, 22, 23, and 26 for additional identification requirements.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
5. Protect stored products from damage and liquids from freezing.

1.8 PRODUCT WARRANTIES

A. Warranties specified in other Sections will be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of 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 016000

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 RELATED SECTIONS:

A. Section 01 42 00 REFERENCES for applicable industry standards for products specified.

1.4 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved by Commissioner through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics are listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure.

1.5 ACTION SUBMITTALS

A. Product Specification Submittals: Comply with requirements in Section 01 33 00 SUBMITTAL PROCEDURES. Show compliance with requirements.

B. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Review Action: If necessary, Commissioner will request additional information or documentation for evaluation and will notify the applicable Contractor of approval or rejection of proposed comparable product request.

    a. Format of Approval of Submittal: Per Article 1.6 of Section 01 33 00 SUBMITTAL PROCEDURES.
    b. Use product specified, or products by Manufacturers specified if Commissioner does not issue a decision on use of a comparable product request.

1.6 QUALITY ASSURANCE

A. Compatibility of Options: If the applicable Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:

    a. Name of product and manufacturer.
    b. Model and serial number.
    c. Capacity.
    d. Speed.
    e. Ratings.

3. See individual identification sections in Divisions 21, 22, 23, and 26 for additional identification requirements.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
5. Protect stored products from damage and liquids from freezing.

1.8 PRODUCT WARRANTIES

A. Warranties specified in other Sections will be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve the applicable Contractor of Guaranty obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to the City of New York.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for the City of New York.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 77 00 CLOSEOUT PROCEDURES.

PART II – PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Descriptive, performance, and reference standard requirements in the Specifications establish required characteristics of products.
2. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
3. Commissioner will review and approve products with warranties meeting the requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Commissioner will make selection.

B. Or Approved Equal:

1. Comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product, or for use of a product by an unnamed Manufacturer, as designated by the term "Or approved equal".

2. Submit additional documentation required by Commissioner, in order to establish equivalency of proposed products. Evaluation of "Or approved equal" product status is by the Commissioner, whose determination is final.

C. Product Selection Procedures:

1. Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products will be considered. Comply with requirements in "Comparable Products" Article for consideration of a product by an unnamed manufacturer. Products' listing is indicated by the following:

    a. Products: Subject to compliance with requirements, provide one of the following:

        1) Manufacturer; Product designation
        2) Manufacturer; Product designation
        3) Manufacturer; Product designation
        4) Or approved equal

2. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed. Comparable products from unnamed Manufacturers will be considered. Comply with requirements in "Comparable Products" Article for consideration of a product by an unnamed manufacturer. Manufacturer's listing is indicated by the following:

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) Manufacturer
        2) Manufacturer
        3) Manufacturer
        4) Or approved equal

3. Basis-of-Design Product: Where Specifications name a basis-of-design product, provide the specified product, or a comparable product by one of the other named manufacturers. Drawings may indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Specifications indicate performance requirements and physical properties, durability and other special and required features that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers. Basis-of-Design Product listing is indicated by the following:

    a. Subject to compliance with requirements, provide [product indicated on Drawings] [manufacturer's name; product name or designation] or comparable product by one of the following:

        1) Manufacturer
        2) Manufacturer
        3) Or approved equal

4. Sole Source Product (Single Proprietary): Where Specifications name a single manufacturer and product, provide the named product. A Sole Source Product selection requires prior request by the Design Consultant and approval by the Commissioner for its inclusion in specifications. Sole Source Product is indicated by the following phrase listing:

    a. Sole Source Product: Manufacturer's name and Product designation.

        1) No substitutions Permitted.

D. Visual Matching Specification: Where Specifications require "match Commissioner's sample," provide a product that complies with requirements and matches Commissioner's sample. Commissioner's decision will be final on whether a proposed product matches.

E. Visual Selection Specification: Where Specifications include the phrase "as selected by Commissioner from manufacturer's full range" or similar phrase, select a product that complies with requirements. Commissioner will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products (Or Approved Equal): Commissioner will consider the applicable Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Commissioner may return requests without action, except to record noncompliance with these requirements:

B. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.

C. Evidence that proposed product provides specified warranty.

D. List of similar installations for completed projects with project names and addresses and names and addresses of architects and Owners, if requested.

E. Samples, if requested.

F. Submittal Requirements: Approval by the Commissioner of the applicable Contractor's request for use of comparable product is not intended to satisfy other submittal requirements.

G. Comply with all other specified product and submittal requirements.

PART III – EXECUTION (Not Used)

END OF SECTION 016000

SECTION 01 73 00
EXECUTION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes general procedural requirements governing execution of the Work including without limitation the following:

1. Delivery of Materials
2. Contractor's Superintendent
3. Surveys
4. Borings
5. Examination
6. Environmental Assessment
7. Preparation
8. Deferred Construction
9. Installation
10. Permits
11. Transportation
12. Sleeves and Hangers
13. Sleeve and Hanger Drawings
14. Cutting and Patching
15. Location of Partitions
16. Furniture and Equipment
17. Removal of Rubbish and Surplus Material
18. Cleaning
19. Security and Protection of Work Site
20. Maintenance of Site and Adjoining Property
21. Maintenance of Project Site
22. Safety Precautions for Control Circuits
23. Obstructions in Drainage Lines
24. Payment for Allowances
25. Correction of the Work

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 33 00 SUBMITTAL PROCEDURES
D. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT & DISPOSAL
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

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 1 - PRODUCTS (Not Used)

PART 2 - EXECUTION

3.1 DELIVERY OF MATERIALS:

A. Material Orders: The Contractor must furnish to the Commissioner a copy of each material order, indicating date of order and quantity of material, and must also notify the Commissioner when materials have been delivered to the Site and in what quantities.

B. Ample Quantities: The Contractor must deliver materials in ample quantities to ensure the most prompt and uninterrupted progress of the Work so as to complete the Work within the Contract time.

C. Containers: The manufacturer's containers must be delivered with unbroken seals and must bear proper labels.

D. Deliveries: The Contractor must coordinate deliveries in order to avoid delaying or impeding the progress of the Work.

E. Handling: The Contractor must provide equipment and personnel to handle products by methods to prevent soiling or damage.

1. Promptly inspect shipments to assure products comply with requirements, quantities are correct, and products are undamaged.

2. Promptly return damaged shipments or incorrect orders to manufacturer.

3. For materials or equipment to be reused or salvaged, use special care in removal, storage and reinstallation to insure proper function in completed Work.

F. Storage: Store products in accordance with provisions of Article 3.1 of the Standard Construction Contract, and periodically inspect to assure that stored products are undamaged and are maintained under required conditions.

G. Stacking: All materials must be properly stacked in convenient places adjacent to the Site, or where directed, and protected in a satisfactory manner. Stacked materials must be arranged so as to not interfere with visibility of traffic control devices.

H. Overloading: If the Commissioner permits the storage of materials in any part of the Project area, they must be so stored as to cause no overloading.

I. No Interference: If it becomes necessary to remove and restack materials to avoid impeding the progress of any part of the Work or interfering with the Work to be done by any trade subcontractor, the Contractor must remove and restack such materials at no additional cost to the City.

3.2 CONTRACTOR'S CONSTRUCTION SUPERINTENDENT:

A. Contractor's Construction Superintendent: The Contractor must devote its time and personal attention to the Work and must employ and retain at the Project Site, from commencement until Final Acceptance, a Contractor's Construction Superintendent. The Contractor's Construction Superintendent must be registered with the New York City Department of Buildings (DOB) in compliance with the Construction Superintendent Rule of the City of New York, be competent and capable of maintaining proper supervision and care of the Work, and be acceptable to the Commissioner. The Construction Superintendent, in the absence of the Contractor, and irrespective of any superintendent or foreman employed by any subcontractor, must see that the instructions of the Commissioner are carried out.

B. Replacement: The Contractor's Construction Superintendent on the job must not be changed or removed without the consent of the Commissioner.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 SURVEYS:

A. Line and Grade: The City will establish a baseline and bench mark near the Site of the Work for use by the Contractor in connection with the performance of the Work.

B. Responsibility: The Contractor must establish all other lines and elevations required for the Work and must be solely responsible for the accuracy thereof.

C. Safeguard All Points: The Contractor must safeguard all points, stakes, grade marks and bench marks made or established by the Contractor on the Work. The Contractor must re-establish same if disturbed, and bear the entire expense of rectifying the Work if improperly installed due to not maintaining, protecting or removing without authorization from the Commissioner such established points, stakes, or marks.

D. City Monuments and Markers: No Work must be performed near City monuments or markers so as to disturb them until the said monuments or markers have been referenced or reset or otherwise disposed of by the relevant Agency or party who installed them.

E. Foundations: The Contractor must furnish certification from a licensed Surveyor that all portions of the foundation Work are located in accordance with the Contract Drawings and at the elevations required thereby. This certification must show the actual locations and the actual elevations of all the Work in relation to the locations and elevations shown on the Contract Drawings, including, but not restricted to the following:

1. The locations and elevations of all piles, if any.
2. Elevations of tops of all spread footings, tops of pile caps, and tops of all foundation walls, elevator pit walls and ramp walls.
3. Location of all footing centers and pier centers including those for exterior wall columns.
4. Location of all foundation walls including wall columns, elevator pit walls and ramp walls.

F. Wall Lines: After the first courses of masonry or stone have been laid, the Contractor must establish the permanent lines of exterior walls. The Contractor must promptly furnish certification from a licensed Surveyor in the form of signed original drawings showing the exact location of such wall lines of all portions

of all structures. Except at its own risk, the Contractor must not proceed further with the erection of walls until the Surveyor's certification has been submitted and verified for correct location of wall lines.

G. Surveyor: The Surveyor selected for any of the purposes mentioned in Paragraph E and Paragraph F above, and Paragraph I below, must be a land Surveyor licensed in the State of New York and must be subject to the approval of the Commissioner. The Surveyor must not be a regular employee of the Contractor, nor must the Surveyor have any interest in the Contract. The Surveyor's certification must represent an independent and disinterested verification of all layout. The Surveyor must report to the Department of Design and Construction's (DDC) Resident Engineer each time upon arrival to and departure from the Site and review with the Resident Engineer the data required for the Project.

H. Final Certification: Final certification must be submitted upon completion of the Work or upon completion of any subdivision of the Work as directed by the Commissioner. Any exceptions or deviations from the Contract Drawings must be noted on the final certificate and must include any maps, plates, notes, pertinent documents and data necessary, in the opinion of the Commissioner, to constitute a full and complete report.

I. Final Survey: The Contractor must submit to DDC for submission to DOB a final Survey by the licensed Surveyor showing the location of the new Work, before completion of the Work. This Survey must show the location of the first tier of beams or of the first floor; the finish grades of the open spaces on the plot; the established curb level and the location of all other Work on the plan, together with the location and boundaries of the lot or plot upon which the Work is constructed, curb cuts, all yard dimensions, etc.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4

3.4 BORINGS:

A. The work of this article must be the responsibility of the Contractor unless otherwise indicated.

B. Reference Drawings: The boring drawings as listed on the title sheet are for information to the bidder and are to be used under the conditions as follows:

1. Boring logs: shown on the boring drawings, record information obtained under engineering supervision in the course of exploration carried out by or under the direction of DDC at the Site.

2. Soils and Rock Samples: All inferences are drawn from the indications observed as made by engineering and scientific personnel. All such inferences and all records of the Work, including soil samples and rock cores, if any, are available to bidders for inspection.

3. Certification of Samples: The City certifies that the Work was carried out as stated, and that the soil samples and rock cores were actually taken from the site at the times, places, and in the manner indicated on the boring drawings. The samples are available for inspection in DDC’s Subsurface Exploration Unit.

4. Bidder’s Responsibility: The bidder, however, is responsible for any conclusions to be drawn from the Work. If the bidder accepts those of the City, it must do so at its own risk. If the bidder prefers not to assume such risk, the bidder is under the obligation of employing its own experts to analyze the available information and must be responsible for any consequences of acting on their conclusions.

5. Continuity Not Guarantee: The City does not guarantee continuity of conditions shown at actual boring locations over the entire Site. Where possible, borings are located to avoid all obstructions and previous construction which can be found by inspection of the surface. The bidder is required to estimate the influence of such features from its own inspection of the Site.

3.5 EXAMINATION:

A. Existing Conditions: The existence and location of Site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning the Work, the Contractor must investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, the Contractor must verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground utilities and other construction indicated as existing are not guaranteed. Before beginning Site Work, the Contractor must investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, the Contractor must verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, water-service piping, and underground electrical services.
2. The Contractor must furnish location data for Work related to the Project that must be performed by public utilities serving the Project Site.

C. Acceptance of Conditions: Examine all existing substrates, areas, and conditions, with the subcontractor responsible for installation or application, for compliance with requirements for installation tolerances and other conditions affecting performance. The Contractor must record observations of these examinations:

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.6 ENVIRONMENTAL ASSESSMENTS:

A. City Responsibilities: An Environmental Assessment and survey is performed by DDC and its findings are included in the Contract Documents. In accordance with the NYC Administrative Code Title 15 Chapter 1, an asbestos survey is required to be performed by an Asbestos Investigator certified by the NYC Department of Environmental Protection (DEP) to identify the presence of asbestos containing material (ACM) prior to any alteration, renovation, or demolition activity. The findings of such survey are required for the submission of approvals and permits issued by DOB. When the findings indicate that asbestos containing material is present and will be disturbed during the alteration, renovation, or demolition activity, then abatement design specifications will be incorporated into the Contract Documents. The Contractor must comply with all federal, state and local asbestos regulations affecting the work for this Contract.

B. Contractor Responsibility: The Contractor must comply with all federal, state and local environmental regulations, including without limitation, United States Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) regulations, which require the Contractor to assess if lead-based paint will be disturbed during the Work in order to protect the Contractor's workers and the building occupants from migration of lead dust into the air. The Contractor must comply with all federal, state and local environmental waste disposal regulations which may be required during the Work. The Contractor is required to hire licensed abatement and disposal companies for the requisite Work.

3.7 PREPARATION:

A. Field Measurements: The Contractor must verify all dimensions and conditions on the Site so that all Work will properly join the existing conditions.

B. Before commencing the Work, the Contractor must examine all adjoining materials on which its Work is in any way dependent on good workmanship in accordance to the intent of the Specifications and the Contract Drawings. The Contractor must report to the Commissioner any condition that will prevent it from performing Work that conforms to the required Specifications.

C. Existing Utility Information: The Contractor must furnish information to the Commissioner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Additionally, the Contractor must coordinate with authorities having jurisdiction.

D. Space Requirements: The Contractor must verify space requirements and dimensions of items shown diagrammatically on the Contract Drawings.

3.8 DEFERRED CONSTRUCTION:

A. In order to permit the installation of any item or items of equipment required to be furnished and installed within the time allowed for completing the Work of the Contract, the Contractor must defer construction Work limited to adequate areas as approved and certified by the Commissioner.

B. The Contractor must confer with the affected trade subcontractors and ascertain arrangements, time, and facilities necessary to be made by the Contractor in order to execute the provisions specified herein.

3.9 INSTALLATION:

A. General: The Contractor must locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical Work plumb and make horizontal Work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated on the Contract Drawings.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory-prepared and field-installed. Check shop drawings of other work and work of trade subcontractors to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the Design Consultant.

2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral

anchors that are to be embedded in concrete or masonry. Deliver such items to Project Site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.10 PERMITS:

A. The Contractor must comply with all local, state and federal laws, rules, and regulations affecting the Work of this Project, including, without limitation, (1) obtaining all necessary permits for the performance of the Work prior to commencement thereof, and (2) complying with all requirements for the disposal of demolition and/or construction debris, waste, etc., including disposal in City landfills. The Contractor must be responsible for all costs in connection with such regulatory compliance, unless otherwise specified in the Contract.

3.11 TRANSPORTATION:

A. Availability: The Contractor must determine the availability of transportation facilities and dockage for the use of its employees, equipment, and materials, and the conditions under which such use will be permitted.

B. Costs: If transportation facilities and dockage are available and are permitted to be used by the governmental agency having jurisdiction, the Contractor must pay all necessary costs and expenses, and abide by all rules and regulations promulgated in connection therewith.

C. Vehicles: With respect to the use of vehicles on highways and bridges, the Contractor's attention is directed to the limitations set forth in the Rules of the City of New York, Title 34, Chapter 4, Section 4-15.

D. Continued Use: It is understood that the Commissioner makes no warranty as to the continued use by the Contractor of such facilities.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.12

3.12 SLEEVES AND HANGERS:

A. Coordinate with Progress Schedule: The Contractor must promptly furnish and install conduits, outlets, piping sleeves, boxes, inserts and all other materials and equipment that is to be built into the Work in conformity with the requirements of the Project.

B. Cooperation of Subcontractors: All subcontractors must fully cooperate with each other in connection with the performance of the above Work as "cutting in" new work is neither contemplated nor will it be tolerated.

C. Timeliness: To avoid delay, in the event that timely delivery of sleeves and other materials cannot be made, the Contractor may arrange to have boxes or other forms set at the locations where the piping or other material is to pass through or into the slabs, walls or other Work. Upon the subsequent installation of the sleeves or other material, the Contractor must fill around them with materials as required by the Contract. The necessary expenditures incurred for the boxing out and filling in must be borne by the Contractor.

D. Inserts: The Contractor is to install strip inserts four (4) foot on center and perpendicular to beams in ceiling slabs of boiler, machine, and mechanical equipment rooms. Inserts are to be installed for strippable concrete slabs only.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.13

3.13 SLEEVE AND PENETRATION DRAWINGS:

A. As soon as practicable after the commencement of Work, and when the order in which concrete for the first slabs, walls, etc. to be poured is determined, the Contractor must submit to DDC a sketch indicating the location and size of all penetrations for sleeves, ducts, etc. which will be required to accommodate the mechanical trades in order to determine if such penetrations will materially weaken the Project's structure.

The sketch must be stamped and returned if approved and/or comments will be transmitted. The Contractor must continue to submit sketches as the pouring schedule and the concrete Work progresses and until approvals for the penetration sketches have been given. The Contractor must not predicate its layout Work on unapproved sketches.

3.14 CUTTING AND PATCHING:

A. Responsibility: The Contractor must do all cutting, patching, and restoration required by its Work, unless otherwise particularly specified in the Specifications.

B. Restore Work: The Contractor must restore any Work damaged during the performance of the Work.

C. Competent Workers: All restoration Work must be done to the satisfaction of the Commissioner by competent workers skilled in the trade required by such restoration. If, in the judgment of the Commissioner, workers engaged in restoration Work are incompetent, they must be replaced immediately by competent workers.

D. Structural Elements: Do not cut and patch structural elements without the prior approval, in writing, of the Resident Engineer.

E. Operational Elements: Do not cut and patch operating elements and related components.

F. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Commissioner's opinion, reduce the building's aesthetic qualities. The Contractor must remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

G. Existing Warranties: The Contractor must remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

H. Removals: The Contractor must remove from the premises all demolished materials of every nature or description resulting from cutting, patching, and restoration work, in accordance with the requirements hereinafter stipulated under Sub-Section 3.17 herein and as further required in Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.15

3.15 LOCATION OF PARTITIONS:

A. Within three (3) weeks after the concrete slabs have been poured on each floor level, the Contractor must immediately locate accurately all of the partitions, including the door openings, on the floor slabs in a manner approved by the Resident Engineer.

3.16 FURNITURE AND EQUIPMENT:

A. Responsibility: The Contractor is responsible for moving all loose furniture and/or equipment in all areas where the location of such furniture and/or equipment interferes with the proper performance of its Work.

B. Protection: All such furniture and/or equipment must be adequately protected with dust cloths and returned to their original locations when directed to do so by the Resident Engineer.

3.17 REMOVAL OF RUBBISH AND SURPLUS MATERIALS:

A. Of the waste that is generated during demolition, as many of the waste materials as economically feasible must be reused, salvaged, or recycled. Waste disposal in landfills must be minimized. Comply with requirements of Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

B. Rubbish: Rubbish must not be thrown from the windows or other parts of the Project. Mason's rubbish, dirt and other dust-producing material must be wetted down periodically.

C. Location: The Contractor must clean the Project Site and Work area daily, sweep up, and deposit at a location designated on each floor, all of its rubbish, debris, and waste materials as it accumulates or more frequently when directed by the Resident Engineer. Wood crating must be broken up, neatly bundled, tied, and stacked ready for removal and be deposited at a location designated on each floor.

1. Comply with requirements in NYC Fire Department for removal of combustible waste materials and debris.

2. Do not hold materials more than seven (7) Days during normal weather or three (3) Days if the temperature is expected to rise above 80 degrees F (27 degrees C).

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

D. Laborers: Since the Contractor is responsible for the removal of all rubbish, etc., from the Site, the Contractor must employ and keep engaged for this purpose an adequate number of laborers.

E. Surplus Materials: The Contractor must remove from the Site all surplus materials when there is no further use for same.

F. Tools and Materials: At the conclusion of the Work, all erection plant, tools, temporary structures and materials belonging to the Contractor must be promptly removed.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

3.18 CLEANING:

A. The Contractor must thoroughly clean all equipment and materials furnished and installed, and must deliver such materials and equipment undamaged in a clean and new appearing condition up to date of Final Acceptance.

B. Site: Maintain Project Site free of waste materials and debris.

C. Installed Work: Keep installed Work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of the product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

D. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

E. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration up to date of Final Acceptance.

F. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration up to date of Final Acceptance.

3.19 SECURITY AND PROTECTION OF WORK SITE:

A. Provide protection of installed Work, including appropriate protective coverings, and maintain conditions that ensure installed Work is without damage or deterioration up to date of Final Acceptance.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

C. Secure and protect Work and Work Site against damage, loss, injury, theft and/or vandalism.

D. Maintain daily sign-in sheets of workers and visitors and make the sheets available to the Commissioner.

3.20 MAINTENANCE OF SITE AND ADJOINING PROPERTY:

A. The Contractor must take over and maintain the Project Site, after order to start Work.

B. The Contractor must be responsible for the safety of the adjoining property, including sidewalks, paving, fences, sewers, water, gas, electric and other mains, pipes and conduits etc. until the date of Final Acceptance. The Contractor must, at its own expense, except as otherwise specified, protect same and maintain them in at least as good a condition as that in which the Contractor finds them.

C. All pavements, sidewalks, roads and approaches to fire hydrants must be kept clear at all times, maintained and repaired to serviceable condition with materials to match existing.

D. Provide and keep in good repair all bridging and decking necessary to maintain vehicular and pedestrian traffic.

E. The Contractor must also remove all snow and ice as it accumulates on the sidewalks within the Contract Limits Lines.

3.21 MAINTENANCE OF PROJECT SITE:

A. The Contractor must take over and maintain all Project areas, after order to start Work.

B. Until the date of Final Acceptance, the Contractor must be responsible for the safety of all Project areas, including water, gas, electric and other mains and pipes and conduits and must, at the Contractor's own expense, except as otherwise specified, protect same and maintain them in at least as good condition as that in which the Contractor finds them.

C. All pavements, sidewalks, roads and approaches to fire hydrants must be kept clear at all times, maintained, and if damaged, repaired to serviceable conditions with materials to match existing.

D. The Contractor must keep the space for the Resident Engineer in a clean condition.

3.22 SAFETY PRECAUTIONS FOR CONTROL CIRCUITS:

A. Control circuits, the failure of which will cause a hazard to life and property, must comply with DOB Bureau of Electrical Control requirements.

3.23 OBSTRUCTIONS IN DRAINAGE LINES:

A. The Contractor must be responsible for all obstructions occurring in all drainage lines, fittings, and fixtures after the installations and cleaning of these drainage lines, fittings, and fixtures, as certified by the Resident Engineer. Roof drains must be kept clear of any and all debris. Any stoppage must be repaired immediately at the expense of the Contractor.

3.24 PAYMENT OF ALLOWANCES:

A. Unless otherwise called for in the Specifications, the following requirements apply to the payment and execution of Allowances established for the Contractor:

1. Allowances are to be utilized when ordered and authorized in writing by the Commissioner.

2. The Contractor will be paid on a time and materials (T&M) basis under the Allowance. Labor will be paid based on the Contractor's Certified Payrolls, all other expenses will be paid on an invoice basis. A markup of twelve percent (12%) for overhead and ten percent (10%) for profit will be allowed, except that no markup will be allowed on Payroll Taxes or on the premium portion of overtime pay or on sales and personal property taxes.

3.25 CORRECTION OF THE WORK

A. Subject to the terms of the Contract, the Contractor must complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Contractor must repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that 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

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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.

(No Text on This Page)

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and general procedural requirements for Closeout Procedures, including, without limitation, the following:

1. Definitions
2. Substantial Completion
3. Final Acceptance
4. Warranties
5. Final Cleaning

B. LEED: Refer to the Addendum to identify whether this Project is designed to comply with a Certification Level according to the U.S. Green Building Council's (USGBC) Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

C. COMMISSIONING: Refer to the Addendum to identify whether this Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED- NC procedures, as described in Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS and Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE. The Contractor must cooperate with the Commissioning Agent and provide whatever assistance is required.

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
D. Section 01 78 39 CONTRACT RECORD DOCUMENTS
E. Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

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, he/she will notify the Contractor of those items that must be completed or corrected before the determination of Final Acceptance will be issued.

C. Final Acceptance: The Work will be accepted as final and complete as of the date of the Resident Engineer's inspection if, upon such inspection, the Resident Engineer finds that all items on the Final Approved Punch List are complete and no further Work remains to be done. The Commissioner will then issue a written determination of Final Acceptance.

1.7 WARRANTIES:

A. Schedule B of the Addendum lists the items of materials and/or equipment for which manufacturer warranties are required. For each item of material and/or equipment listed in Schedule B, the Contractor must obtain a written warranty from the manufacturer. Such warranty must provide that the material or equipment is free from defects for the period set forth in Schedule B and will be replaced or repaired within such specified period. The Contractor must deliver all required warranties to the Commissioner.

B. Unless indicated otherwise, warranties are to take effect on the date of Substantial Completion.

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.

(No Text on This Page)

SECTION 01 78 39
CONTRACT RECORD DOCUMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and general procedural requirements for Contract Record Documents, including:

1. Contract Record Drawings
2. Record Specifications, Addenda and Change Orders
3. Record Product Data
4. Record Sample Submittal
5. Construction Record Photographs
6. Operating and Maintenance Manuals
7. Final Site Survey
8. Demonstration and Orientation DVD
9. Guarantees and Warranties
10. Waste Disposal Documentation
11. LEED Materials and Matrix
12. Miscellaneous Record Submittals

B. The Department of Design and Construction (DDC), at the start of construction (kick-off meeting), will furnish to the Contractor, at no cost, a complete set of Contract Record Drawings (PDF set) pertaining to the Work to be performed under the Contract. It is the responsibility of the Contractor to modify the Contract Drawings to indicate all changes and corrections, if any, occurring in the Work as actually installed. The Contractor is required to furnish all other drawings, if necessary, such as Addenda Drawings and Supplementary Drawings as may be necessary to indicate all Work in detail as actually completed. <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:

B. SCHEDULE B: Requirements for guarantees and warranties for the Project are set forth in Schedule B, which is included as part of the Addendum.

C. FORM: For all guaranty requirements set forth in Schedule B, the Contractor must provide a written guaranty, in the form set forth herein.

D. Submit fully executed and signed manufacturers' warranties as listed in the Project Specifications and outlined in Schedule B of the Addendum. Refer to Section 01 77 00, CLOSEOUT PROCEDURES for submittal requirements.

GUARANTY

DDC PROJECT # _____

PROJECT DESCRIPTION _____

_____

CONTRACT # _____

SPECIFICATION SECTION # AND TITLE _____

_____

GUARANTY TO BE IN EFFECT FROM _____

TO _____

The Contractor hereby guarantees that the Work specified under the above section of the aforesaid Contract will be free from defects of material and/or workmanship, for the period indicated above.

The Contractor also guarantees that it will promptly repair, restore, rebuild or replace whichever may be deemed necessary by the City, any or all defective material or workmanship of the aforementioned section, that may appear within the guaranty period and any finished Work to which damage may occur because of such defects, to the satisfaction of the City and without any cost or expense to the City.

The Contractor hereby agrees to pay to the City the cost of the repairs or replacements should the City make the same because of the failure of the Contractor to do so.

Contractor: _____

By: _____
Signature of Partner or Corporate Officer

Print Name: _____

Subscribed and sworn to before me this
day of _____ , year _____

_____
Notary Public

2.10 WASTE DISPOSAL DOCUMENTATION:

A. Certify and deliver to the Commissioner all documentation including reports, receipts, certificates, records etc. for the collection, handling, storage, classification, testing, transportation, recycling and/or disposal of all Non-Hazardous Construction Waste as required by Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL, and Hazardous Waste as required by other Project Specification Sections. Certify compliance with all applicable governing laws, codes, rules and regulations.

2.11 MISCELLANEOUS RECORD DOCUMENTS:

A. Refer to other Project Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Prior to Final Acceptance, complete miscellaneous records and place in good order, properly identified and bound or otherwise organized to allow for use and reference.

B. Submit three (3) copies of each document to the Commissioner or as otherwise directed by the Commissioner.

PART III – EXECUTION

3.1 RECORDING AND MAINTENANCE:

A. Recording: Maintain one (1) copy of each submittal during the construction period for Contract Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of the Project.

B. Maintenance of Record Documents and Samples: Store Contract Record Documents and samples in the field office apart from the Contract Documents used for construction. Do not use Contract Record Documents for construction purposes. Maintain Contract Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to the Contract Record Documents for the Resident Engineer's reference during normal working hours.

END OF SECTION 01 78 39

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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 his/her subcontractors complying with the LEED Action Plans and for providing required LEED documentation as required for the project.

C. Distribution and Compilation: The Contractor is responsible for distributing the EBMCF and any other forms or templates required for the subcontractors to record LEED documentation. The Contractor also be responsible for collecting and compiling EBMCF information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.

D. Meetings: Sustainable design and construction issues must be discussed at the following meetings:

1. Demolition kick-off meeting
2. Construction kick-off meeting
3. Construction kick-off meeting for LEED (independent meeting)
4. Weekly job-site progress and coordination meetings
5. Closeout meeting

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.03

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 his/her subcontractors complying with the LEED Action Plans and for providing required LEED documentation as required for the Project.

C. Distribution and Compilation: The Contractor is responsible for distributing the LEED v4 MR Credits Calculator for Building Product Disclosure and Optimization, the LEED v4 EQ Credit Low-Emitting Materials Calculator, and any other forms or templates required for the subcontractors to record LEED documentation. The Contractor is also responsible for collecting and compiling Building Product Disclosure and Optimization and Low-Emitting Materials information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.

D. Meetings: Sustainable design and construction issues must be discussed at the following meetings in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION:
   1. Demolition kick-off meeting

2. Construction kick-off meeting
3. Construction kick-off meeting for LEED (independent meeting)
4. Weekly job-site progress and coordination meetings
5. Closeout meeting

1.10 REFERENCES:

A. New York State Standards and Specifications for Erosion and Sediment Control, amended November 2016: http://www.dec.ny.gov/docs/water_pdf/2016nysstanec.pdf

B. 2012 EPA Construction General Permit: https://www.epa.gov/npdes/epas-2012-construction-general-permit-cgp-and-related-documents

C. South Coast Air Quality Management District (SCAQMD), Rule 1168: www.aqmd.gov

D. South Coast Air Quality Management District (SCAQMD), Rule 1113: www.aqmd.gov

E. CDPH Standard Method v1.1-2010: www.cal-iaq.org

F. ISO 17025: www.iso.org

G. ISO Guide 65: www.iso.org

H. CARB 93120 ATCM: arb.ca.gov/toxics/compwood/compwood.htm

I. ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components and Seating: bifma.org

J. ANSI/BIFMA e3-2011 Furniture Sustainability Standard: bifma.org

K. ISO 14021–1999, Environmental labels and declarations—Self Declared Claims (Type II Environmental Labeling): www.iso.org

L. ISO 14025–2006, Environmental labels and declarations (Type III Environmental Labeling): www.iso.org

M. ISO 14040–2006, Environmental management, Life cycle assessment principles, and frameworks: www.iso.org

N. ISO 14044–2006, Environmental management, Life cycle assessment requirements, and guidelines: www.iso.org

O. International Standard ISO 21930–2007 Sustainability in building construction—Environmental declaration of building products: www.iso.org

P. Federal Trade Commission, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e): www.ftc.gov/bcp/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 his/her subcontractors complying with the EPP requirements and for providing required EPP documentation as required for the project. The Contractor is responsible for distributing the forms or templates required for the subcontractors to record EPP documentation. The Contractor is also responsible for collecting and compiling information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.

D. The Contractor must respond in a timely manner to questions and requests from the Commissioner, Design Consultant and MOCS regarding EPP requirements that are the responsibility of the Contractor. Document responses as informational submittals.

1.6 ACTION SUBMITTALS:

A. General Requirements:

1. EPP Documentation Submittals for applicable and compliant product data, as stated in the EPP Minimum Standards for Construction Products, is to be documented in the form of a Vendor Survey and supporting manufacturer's data sheets highlighting EPP compliance-related data. Include in the Vendor Survey the anticipated quantity of product purchased and cost per unit data. See attached sample Vendor Survey form.

2. Compliance with EPP requirements will be used as one criterion to evaluate product selection. Assemble EPP Documentation Submittal information into one package per contract specification section(s) (or per subcontractor). Incomplete or inaccurate EPP Documentation submittals may be used as the basis for the rejection of products or assemblies.

3. Update the quantities and costs in the Vendor Survey once products are approved and purchased and document as information submittal.

1.7 INFORMATIONAL SUBMITTALS

A. For each registered contract, the Contractor must maintain a Master Vendor Survey, an updated tracking log of all equipment, materials and products purchased on a contract that are required to comply with EPP. Submit the Master Vendor Survey on a monthly basis and update the costs once products are purchased.

1. Upon request by MOCS, submit the Master Vendor Survey and supporting documents.

B. EPP Progress Reports: Concurrent with each Application for Payment, submit reports of purchasing activities for each of the EPP-applicable equipment, materials and products listed in Sub-section C below.

C. Project Materials Cost Data: For Vendor Survey and EPP Progress Reports, include breakout of costs for the following categories of items:

1. Appliances.
2. Architectural Coatings.
3. HVAC Equipment.
4. Lighting Products.
5. Miscellaneous Products – Construction.
6. Plumbing Fixtures.

PART II – PRODUCTS

2.1 MATERIALS:

A. Detailed Requirements. This sub-section defines the information and documents to be provided for each EPP-applicable equipment, material and product type, as identified in each specification section:

1. Appliances – Residential:

All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following residential appliances shall comply with this requirement:

a. Clothes Washers

b. Dehumidifiers

c. Dishwashers, Standard-Sized

d. Freezers, Upright, Chest and Compact

e. Refrigerators and Refrigerator-Freezers, Standard-Sized and Compact

Microwave Ovens shall comply with the following requirements:

a. Recommended Standby Levels: 2 watts or less

b. Best Available Standby Level: 2 watts or less

2. Architectural Coatings:

a. For the products listed below, the maximum content of Volatile Organic Compounds (VOCs) shall be determined according to the American Society for Testing and Materials test method D 5116 (Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products).

Architectural Coating	**Maximum Concentration of VOC in Grams per Liter**
Clear Wood Coating – Clear-Brushing lacquers	275
Clear Wood Coating – Sanding Sealers (Other than Lacquers)	275
Clear Wood Coating –Varnishes	275
Floor Coatings	100
Lacquers - Pigmented	275
Primers for Flat Paint	100
Primers for Non-Flat Paint	150
Rust Preventative/Anti-Corrosive Paint	250

b. Any product listed below that is compliant with Part 205 of Title Six of the New York Codes, Rules and Regulations meets the standard required under EPP Minimum Standards for Construction Products. The maximum content of VOCs for these products shall be determined according to the test method required under part 205.6 of such part.

Architectural Coating	**Maximum Concentration of VOC in Grams per Liter**
Clear Wood Coating – Conversion Varnishes	725
Clear Wood Coating – Lacquers (Including Lacquer Sanding Sealers)	550
Concrete Bond Breakers	350
Concrete Curing Compounds	350
Concrete Surface Retarders	780
Dry Fog Coatings	400
Faux Finishing Coatings	350
Fire-Resistive Coatings	350
Fire-Retardant Coatings	650
Fire-Retardant Coatings - Opaque	350
Flat Paint	100
Form Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420
Industrial Maintenance (IM) Coatings	340
Low Solids Coatings	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	300
Metallic Pigmented Coatings	500
Multi-Color Coatings	500
Nonflat High-Gloss Coatings	250
Nonflat Paint	150
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	200
Quick-Dry Enamels	250
Quick-Dry Primers, Sealers, and Undercoaters	200
Recycled Coatings	250
Roof Coatings	250
Roof Coatings (Bituminous)	300
Roof Primers (Bituminous)	350
Shellacs – Clear	730
Shellacs – Opaque	550
Specialty Primers, Sealers and Undercoaters	350
Stains	250
Swimming Pool Coatings and Swimming Pool Repair and Maintenance Coatings	340
Thermoplastic Rubber Coatings and Mastics	550
Waterproofing Concrete / Masonry Sealers	400
Waterproofing Sealers	250
Wood Preservatives	350

c. The products listed below shall be recovered material and comply with the Post-consumer Content and Total Recovered Materials Content requirements.

Architectural Coating	Post-consumer Content (%)	Total Recovered Materials Content (%)
Latex Paint – Consolidated	100	100
Latex Paint – Reprocessed White, Off-White and Pastel Colors	20	20
Latex Paint – Reprocessed Grey, Brown, Earthtones and Other Dark Colors	50-99	50-99

3. HVAC Equipment: Commercial and Residential

a. Commercial

All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Commercial HVAC Equipment shall comply with this requirement:

1. Air Conditioners, Air-Cooled
2. Air Conditioners, Gas/Electric Package Units
3. Heat Pumps, Air Source

Chillers shall comply with the following Part Load Optimized Chillers IPLV and Full Load Optimized Chillers IPLV requirements:

Type	Compressor Type and Capacity	Part Load Optimized Chillers IPLV (kW/ton) Required	Full Load Optimized Chillers IPLV (kW/ton) Required
Air-Cooled	Scroll (30 – 60 tons)	0.86 or less	1.23 or less 1.1
Air-Cooled	Reciprocating (30 – 150 tons)	0.90 or less	1.23 or less 1
Air-Cooled	Screw (70 – 200 tons)	0.98 or less	1.23 or less 0.94
Water-Cooled	Centrifugal (150 – 299 tons)	0.52 or less	0.59 or less
Water-Cooled	Centrifugal (300 – 2,000 tons)	0.45 or less	0.56 or less
Water-Cooled	Rotary Screw (>150 tons)	0.49 or less	0.64 or less

b. Residential

All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Residential HVAC Equipment shall comply with this requirement:

1. Air Conditioners, Central (<65,000 Btu/h)

2. Air Conditioners, Central, Gas/Electric Package Units (<65,000 Btu/h)
3. Air Source Heat Pumps (<65,000 Btu/h)
4. Boilers and Boiler/Hot Water Heaters (<300,000 Btu/h)
5. Ceiling Fans
6. Furnaces and Furnace/Hot Water Heaters (<340,000 Btu/h)
7. Ground Source Heat Pumps (Geothermal)
8. In-Line Ventilating Fan
9. Programmable Thermostats
10. Range Hood and Bathroom /Utility Room Ventilating Fans
11. Room Air Cleaners
12. Room Air Conditioners

4. Lighting Products

a. The following lighting products shall comply with the corresponding BEF requirement:

Product Type	**Number of Lamps**	**Required BEF**
Ballast, Fluorescent, Four-Foot, Linear T12, 34-Watts	1	2.64 or higher
Ballast, Fluorescent, Four-Foot, Linear T12, 34-Watts	2	1.41 or higher
Ballast, Fluorescent, Four-Foot, Linear T12, 34-Watts	3	0.93 or higher
Ballast, Fluorescent, Eight-Foot, Linear T12, 60-Watts	2	0.80 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	1	2.54 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	2	1.44 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	3	1.44 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	4	0.73 or higher
Ballast, Fluorescent, Eight-Foot, Linear T8, 59-Watts	2	0.80 or higher
Ballast, Fluorescent, Four-Foot, U-Bent T12, 34-Watts	1	2.64 or higher
Ballast, Fluorescent, Four-Foot, U-Bent T12, 34-Watts	2	1.41 or higher
Ballast, Fluorescent, Four-Foot, U-Bent T12, 34-Watts	3	0.93 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	1	2.54 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	2	1.44 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	3	0.93 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	4	0.73 or higher

b. All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Lighting Products shall comply with this requirement:

1. Exit Signs
2. Luminaires, Residential

c. Luminaires, Downlight, With Compact Fluorescent Lamps (13-32 Lamp Wattage) shall comply with the following LER requirements:

Luminaire Type (NEMA Designation)	Required LER
Open Optics	29 or higher
Baffled Optics	21 or higher
Lensed Optics	24 or higher

d. Luminaires, Downlight, With Metal Halide Lamps (<150 Watts) shall comply with the following LER requirements:

Luminaire Type (NEMA Designation)	Required LER
Open Optics	35 or higher
Lensed Optics	30 or higher

e. Luminaires, Fluorescent shall comply with the following LER requirements:

Luminaire Type (NEMA Designation)	Number of Lamps	Required LER
Lensed (FL)	2	62 or higher
Lensed (FL)	3	61 or higher
Lensed (FL)	4	61 or higher
VDT-Preferred Louvered (FP)	2	50 or higher
VDT-Preferred Louvered (FP)	3	51 or higher
VDT-Preferred Louvered (FP)	4	54 or higher
Four-Foot (FW)	2	63 or higher
Four-Foot (FW)	4	62 or higher
Four-Foot (FS)	1	70 or higher
Four-Foot (FS)	2	70 or higher
Four-Foot (FI)	1	67 or higher
Eight-Foot (FI)	2	68 or higher

f. Luminaires, Industrial HID, With High Pressure Sodium Lamps (<150 Lamp Wattage) shall comply with the following LER requirements:

Upward Efficiency	Lamp Wattage	Closed Fixture (HR) LER Required	Open Fixture (HR) LER Required
0%	150-399	58 or higher	68 or higher
0%	400-999	63 or higher	84 or higher
0%	>1000	N/A	N/A
1%-10%	150-399	64 or higher	63 or higher
1%-10%	400-999	82 or higher	89 or higher
1%-10%	>1000	N/A	109 or higher
11%-20%	150-399	N/A	78 or higher

11%-20%	400-999	N/A	94 or higher
11%-20%	>1000	N/A	N/A
>20%	150-399	75 or higher	77 or higher
>20%	400-999	N/A	N/A
>20%	>1000	N/A	N/A

5. Miscellaneous Products – Construction

   a. For the products listed below, the maximum content of Volatile Organic Compounds (VOCs) shall be determined according to the American Society for Testing and Materials test method D 5116 (Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products). The products may not contain any volatile organic compound in any concentration exceeding that specified below. Products that are compliant with the Green Label Plus program of the Carpet and Rug Institute are also compliant with this standard.

Carpet Adhesives		
Volatile Organic Compound	**24-Hour Testing Maximum Emission Factor (µg/m2•hr)**	**14-Day Testing Maximum Emission Factor (µg/m2•hr)**
Formaldehyde	50	31
2-ethyl-1-hexanol	300	300
Total Volatile Organic Compounds	800	N/A
Carpet Cushions		
Volatile Organic Compound	**24-Hour Testing Maximum Emission Factor (µg/m2•hr)**	**14-Day Testing Maximum Emission Factor (µg/m2•hr)**
Butylated Hydroxytoluene	300	N/A
Formaldehyde	50	N/A
4-Phenylcyclohexene (4PCH)	50	N/A
Total Volatile Organic Compounds	1000	N/A
Carpets		
Volatile Organic Compound	**24-Hour Testing Maximum Emission Factor (µg/m2•hr)**	**14-Day Testing Maximum Emission Factor (µg/m2•hr)**
Formaldehyde	50	30
4-Phenylcyclohexene	50	17
Styrene	410	410
Total Volatile Organic Compounds	500	N/A

b. The products listed below shall comply with the Recycled Post-consumer Content and Total Recovered Materials Content requirements.

Carpet Cushion – Bonded Polyurethane		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Old Carpet Cushion	15-50	15-50
Carpet Cushion – Jute		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Burlap	40	40
Carpet Cushion – Rubber		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Tire Rubber	60-90	60-90
Carpet Cushion – Synthetic Fibers		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Carpet Fabrication Scrape	No Range Recommended	100
Cement and Concrete		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Cenospheres	No Range Recommended	Minimum 10% (by volume)
Coal fly Ash	No Range Recommended	No Range Recommended
GGBF Slag	No Range Recommended	No Range Recommended
Silica Fume	No Range Recommended	5-10% of cementitious material (dry weight basis)
Channelizers		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic	25-90	No Range Recommended
Rubber (base only)	100	No Range Recommended
Delineators – Fixed		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic	25-90	No Range Recommended
Rubber (base only)	100	No Range Recommended
Steel (BOF, base only)	16	25-30
Steel (BOF, base only)	67	100
Delineators – Flexible		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic PET	25-85	No Range Recommended
Floor Tiles		
Material	Recovered Post-consumer Content (%)	Total Recovered Materials Content (%)
Rubber	90-100	No Range Recommended
Plastic	No Range Recommended	90-100
Insulation - Cellulose		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**

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.

   The plumbing fixtures shall comply with the following Water Efficiency requirements:

Plumbing Fixture	Water Efficiency Requirement
Lavatory Faucets	< 2.0 gallons per minute
Showerheads, Residential and Commercial	< 2.2 gallons per minute
Toilets, Residential and Commercial	< 1.6 gallons per flush
Urinals, Residential and Commercial	< 1.0 gallons per flush

PART III – EXECUTION (Not Used)

END OF SECTION 018113.10

EPP VENDOR SURVEY FORM

Instructions: In the space provided, indicate the following: (1.) Choose Construction for the EPP Book Used (2.) Choose the product type from the drop-down menu; (3.) Choose the product detail from the drop-down menu; (4.) Identify the specific item under Product Description; (5.) Enter the number of products per unit; (6.) Enter the cost per unit; (7.) Enter the units purchased; (8.) Enter the total cost.

Return completed spreadsheet to the contracting agency in the accompanying letter. Thank you.

Agency Acronym	Environmental Preferable Purchasing Information				Quantity and Cost Information				
	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 their Subcontractors, must not be allowed if such changes compromise the stated environmental goals.

1.6 REFERENCES:

A. Rule 1168 – “Adhesive and Sealant Applications”, amended 7 January 2005): South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

B. Rule 1113 - “Architectural Coatings”, amended 9 July 2004: South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

C. Green Seal Standard GS-11- “Paints”, of Green Seal, Inc., Washington, DC, www.greenseal.org

D. Green Seal Standard GC-03- “Anti-Corrosive Paints”, of Green Seal, Inc., Washington, DC, www.greenseal.org

1.7 VOC REQUIREMENTS FOR INTERIOR ADHESIVES, SEALANTS, PAINTS AND COATINGS:

A. GENERAL: Unless otherwise specified herein, the VOC content of all interior adhesives, sealants, paints and coatings (herein referred to as “products”) must not be in excess of **250 grams per liter.**

B. No product may contain any ingredients that are carcinogens, mutagens, reproductive toxins, persistent 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

(No Text on This Page)

SECTION 01 81 19
INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 19

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 CONSTRUCTION IAQ MANAGEMENT GOALS FOR THE PROJECT:

A. The City of New York has determined that this Project must minimize the detrimental impacts on Indoor Air Quality (IAQ) resulting from construction activities. Factors that contaminate indoor air, such as dust entering HVAC systems and ductwork, improper storage of materials on-site, and poor housekeeping, must be minimized.

1.3 RELATED SECTIONS:

A. All sections of the Specifications related to interior construction, MEP systems and items affecting indoor air quality.

B. Division 9 (of the Specifications): Finishes.

C. Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's LEED Rating System, as specified in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

D. Refer to the Addendum to identify whether this project is designed to comply with Section 01 81 13.13 VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS.

E. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS.

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

Volatile Organic Compounds (VOCs)	Chemical compounds common in and emitted by many building products, including solvents in paints, coatings, adhesives and sealants, wood preservatives, composite wood binder, and foam insulations. Not all VOCs are harmful, but many of those contained within building products contribute to the formation of smog and may irritate building occupants by their smell or health impact.
Materials that act as “sinks” for VOC contamination	Absorptive materials, typically dry and soft materials (such as textiles, carpeting, acoustical ceiling tiles and gypsum board) that readily absorb VOCs emitted by “source” materials and release them over a prolonged period of time.
Materials that act as “sources” for VOC contamination	Products with high VOC contents that emit VOCs either rapidly during application and curing (typically "wet" products, such as paints, sealants, adhesives, caulks and sealers) or over a prolonged period (typically “dry” products such as flooring coverings with plasticizers and engineered wood with formaldehyde).

1.5 REFERENCES, RESOURCES:

A. “IAQ Guidelines for Occupied Buildings Under Construction”, Second Edition, 2007, The Sheet Metal and Air Conditioner Contractors National Association (SMACNA). (703) 803-2980, www.smacna.org.

B. ANSI/ASHRAE 52.2-2007, “Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size”, www.ashrae.org.

1.6 LEED BUILDING GENERAL REQUIREMENTS:

A. Implement practices and procedures as necessary to meet the Project’s environmental performance goals as set forth in the specific requirements of this section. Specific Project goals that may impact this area of work include: use of recycled-content materials; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. Ensure that the requirements related to these goals, as defined in this section, are implemented to the fullest extent. Substitutions or other changes to the work will not be allowed if such changes compromise the stated LEED building performance criteria.

1.7 CONSTRUCTION IAQ MANAGEMENT PLAN:

A. The Contractor must prepare a Construction IAQ Management Plan in coordination with each Subcontractor and submit the Construction IAQ Management Plan to the Commissioner for approval in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. The Construction IAQ Management Plan must meet the following criteria:

1. Construction activities must be planned to meet or exceed the minimum requirements of SMACNA’s “IAQ Guidelines for Occupied Buildings under Construction”, Second Edition, 2007.

2. Absorptive materials must be protected from moisture damage when stored on-site and after installation.

3. The planned operation of air handlers during construction must be described. If air handlers are to be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grille and return or transfer duct inlet opening, such that there is no bypass around the filtration media, as determined by ASHRAE 52.2-2007.

4. Filtration media must be replaced immediately prior to occupancy. Filtration media must have a MERV of 13 as determined by ASHRAE 52.2-2007.

5. A sequence of finish installation plan “Plan” must be developed, highlighting measures to reduce the absorption of VOCs by materials that act as “sinks”.

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 91 13
GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 91 13

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. The OPR and BOD documents are included by reference for information only.

C. The Commissioning Plan, prepared by the Commissioning Agent (CxA) under separate contract with the City of New York, contains requirements that apply to this section.

1.2 SUMMARY:

A. This section includes general requirements that apply to implementation of Commissioning without regard to systems, subsystems and equipment being commissioned. General Requirements for building enclosure commissioning are addressed in a separate specification.

B. This Section includes:
1. Definitions
2. Commissioning Team
3. City's Responsibilities
4. Contractor's Responsibilities
5. CxA Responsibilities
6. Commissioning Documentation
7. Submittals
8. Coordination
9. Execution

1.3 RELATED SECTIONS:

A. System-Specific Commissioning requirements indicated in other sections of the Project Specifications for specific requirements for commissioning systems.

B. This Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED procedures, and specific commissioning requirements of the Project Specifications, whichever is more stringent. The Contractor must cooperate with the CxA and provide whatever assistance is required.

C. Related sections include, without limitation, the following:

1.	Section 01 10 00	SUMMARY
2.	Section 01 31 00	PROJECT MANAGEMENT AND COORDINATION
3.	Section 01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
4.	Section 01 78 39	CONTRACT RECORD DOCUMENTS
5.	Section 01 79 00	DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION
6.	Section 01 81 13.03	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS
7.	Section 01 81 13.04	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS
8.	Section 01 91 15	GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Basis of Design (BOD)	A document, prepared by the Design Consultant, that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
Checklists	Forms that outline the step-by-step process that must be executed to fulfill the test requirements and to verify that materials, equipment, assemblies and systems are installed in accordance with the Contract Documents. The CxA must develop the checklists; the Contractor must complete them.
Commissioning	Commissioning is a systematic process of ensuring and documenting that the building systems have been installed in the prescribed manner, are functionally checked and capable of being operated and maintained to perform with the design intent and have documentation to support proper installation and operation. The process does not eliminate or reduce the responsibility of the installing subcontractors to provide a finished product.
Commissioning Agent (Aka Commissioning Authority) (CxA)	Consultant under separate contract with the City of New York to provide Commissioning services for this Project. The CxA must not be an employee of the Contractor, nor will the CxA have any interest in the Contract.
Commissioning Plan	A document developed by the CxA that outlines the organization, schedule, roles and responsibilities, allocation of resources, and documentation requirements of the commissioning process.
Deferred Performance Tests	Performance tests that are performed, at the discretion of the CxA, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design, or other site conditions that disallow the test from being performed.
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and Specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Factory Testing	Testing of equipment on-site or at the factory, by factory personnel, with or without the City’s representative.
Functional Performance Test (FPT)	Functional performance testing includes the dynamic functions and operations of equipment and systems using manual or monitoring methods under various levels of operation. Systems are tested under various modes, such as during low cooling loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarms, power failure, etc. The systems are run through all the control system’s sequences of operation and components are verified to respond as the sequences state. Such tests must be performed as per the protocol written by the CxA which definines the methods, personnel and expectations.
Issue (or Deficiency)	A condition in the installation or function of a component, piece of equipment, or system that is not in compliance with the Contract Documents.

Issues Log	A formal and ongoing record of problems, deficiencies or concerns that have been raised by members of the Commissioning Team during the course of commissioning. The Issues Log is the primary tracking tool to address all Commissioning Issues by concerned parties. All Issues must be addressed and resolved by the concerned parties before the closeout of the Project. This log tracks the resolution performed and date of closure of each Issue.
Master Equipment List (MEL)	A complete listing of all commissioned building equipment, including details such as make, model, location, ID Tag number, etc. that is taken from submittals and is the basis from which checklists will be generated. The MEL is a spreadsheet which is also used as a tracking tool for all milestones of the commissioning process, such as the creation and performance of checklists, startup of equipment, TAB work, etc.
Monitoring	The recording of parameters (flow, current, status, pressure, etc.) of equipment operation using data loggers or the trending capabilities of control systems.
Owner (City of New York) Contracted Tests	Tests paid for by the City of New York outside of the Contractor's Contract and for which the CxA does not provide oversight. These tests will not be repeated during functional testing if properly documented.
Owner's Project Requirements (OPR)	A document, prepared by the Design Consultant that details the functional requirements of a Project and the expectations of how it will be used and operated. These include Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.
Pre-functional (Installation) Checklists	A list of items to inspect and elementary component tests to conduct to verify proper installation of equipment, provided by the CxA to the Contractor. Installation checklists are primarily static inspections and procedures to prepare equipment or systems for initial operation. Pre-functional (Installation) checklists augment, and are combined with, the manufacturer's startup checklist. The Checklists are filled out by the Contractor and reviewed by the CxA.
Sampling	Functional testing for a percentage of the total number of identical or near-identical pieces of equipment.
Seasonal Performance Tests	Functional tests that are deferred until, or performed again when, the system(s) will experience climate conditions close to their design conditions.
Startup	The initial starting or activating of equipment, including executing construction checklists.
Systems, Subsystems, Equipment, and Components	Where these terms are used together or separately, they mean "as-built" systems, subsystems, equipment, and components.
Systems Manual	A system-focused composite document that includes the Operation and Maintenance Manual, and additional information of use to the owner during the occupancy and operations phase.
Testing, Adjusting and Balancing (TAB)	Testing, adjusting, and balancing of the Heating Hot Water (HHW), Chilled Water (CHW) and Heating, Cooling, and Ventilation Airflow distribution system flows and pressures as specified in Contract Documents by a subcontractor certified to perform such work.
Test Requirements	Requirements specifying what modes and functions, etc. must be tested on any given piece of equipment or any given system (integrated or standalone). The test requirements are not the detailed test procedures. The test requirements for each system are specified in the respective Contract Documents.

Trending	Monitoring using the building controls system, and analysis of the data gathered over a period of time.

1.5 COMMISSIONING TEAM:

A. Members Appointed by the Contractor and its Subcontractors: Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the Commissioning process through coordinated actions. The Commissioning Team will consist of, but not be limited to, representatives of the Contractor, including Project superintendent and Subcontractors, installers, suppliers and specialists deemed appropriate by the CxA.

B. Members Appointed by the City:

1. Commissioning Authority/Agent (CxA): The designated person, company, or entity under separate Contract with the City that plans, schedules and coordinates the Commissioning Team to implement the commissioning process.

2. Representatives of the facility user and operation and maintenance personnel.

3. Design Consultant and other concerned entities.

1.6 CITY'S RESPONSIBILITIES:

A. Provide the OPR and BOD documentation to the CxA for use in developing the Commissioning Plan; systems manual; operation and maintenance orientation plan; and testing plans and checklists.

B. Assign operation and maintenance personnel to participate in Commissioning Team activities.

C. Provide full details and results of any Owner- contracted tests relevant to the current Project.

1.7 CONTRACTOR'S RESPONSIBILITIES:

A. The Contractor must provide utility services required for the commissioning process.

B. As a member of the Commissioning Team, the Contractor and Subcontractors must assign representatives with expertise and authority to act on behalf of the Contractor and its Subcontractor and schedule them to participate in and perform Commissioning Team activities including, but not limited to, the following:

1. Participate in scheduled construction-phase coordination and Commissioning Team meetings.

2. Integrate and coordinate commissioning process activities with the construction schedule.

3. Provide all factory acceptance test reports to the CxA through the Commissioner.

4. Respond to any additional specific information requests from the CxA. CxA may request additional documentation necessary for the commissioning process. Requests by CxA may precede, be concurrent with, or follow normal submittals.

5. Ensure the cooperation and participation of all Subcontractors and manufacturers of equipment to be commissioned.

6. Verify and confirm that components, equipment, and system are functioning as per design prior to CxA witnessing testing.

7. Perform testing required in the Commissioning schedule as per the Commissioning process test procedures provided by the CxA, providing no less than 48 hours' notice to the CxA through the Commissioner.

8. Complete installation checklists as Work is completed and return to CxA through the Commissioner.

9. Provide written responses to the CxA through the Commissioner for resolution of Issues recorded in the Issues Log within five (5) business days.

10. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.

11. Submit operation and maintenance manuals for systems and subsystems, and equipment in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS. Such documents must be submitted prior to functional testing.

12. Submit As-Built documents in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.

13. Provide orientation sessions for operations and maintenance personnel (sessions will be witnessed by the CxA) in accordance with Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION. Provide no less than 48 hours' notice to the CxA, through the Commissioner. Video record and edit orientation sessions and provide an electronic recording to the CxA and Commissioner no later than two (2) weeks after the orientation session occurs. Edit as requested by the Commissioner.

1.8 COMMISSIONING AGENT'S (CxA) RESPONSIBILITIES:

A. Organize and lead the Commissioning Team.

B. Prepare a construction-phase Commissioning Plan. Collaborate through the Commissioner with each Contractor and with Subcontractors to develop test and inspection procedures. Include design changes and coordinate Commissioning activities with the overall Project schedule. Identify Commissioning Team member responsibilities, by name, firm, and trade specialty, for performance of each commissioning task. Update the Commissioning Plan during construction as required.

C. Review and comment in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, on submittals from the Contractor for compliance with the OPR, BOD, Contract Documents, and construction-phase Commissioning Plan. Review and comment on performance expectations of systems and equipment and interface between systems relating to the OPR and BOD.

D. Coordinate with the Commissioner, in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION, to convene Commissioning Team meetings for the purpose of coordination, communication and conflict resolution; discuss progress of the commissioning processes.

E. At the beginning of the construction phase, coordinate with the Commissioner's kick-off meeting schedule to conduct an initial construction-phase coordination meeting for the purpose of reviewing the Commissioning activities and establishing tentative schedules for operation and maintenance submittals, operation and maintenance orientation sessions, TAB Work, testing, and Project completion.

F. Perform site visits to observe and inspect construction as described in the Commissioning Plan. Report progress and deficiencies to the Commissioner. In addition to compliance with the OPR, BOD, and Contract Documents, inspect systems and equipment installation for adequate accessibility required for component maintenance replacement and repair.

G. Prepare and distribute project-specific test and inspection procedures and checklists and maintain MEL.

H. Verify air and water systems balancing by sampling, reviewing completed reports and selected site observation. Coordinate submittal reviews with the Commissioner so that the comments are combined into a single review and submitted to the Contractor.

I. Coordinate with the Commissioner to witness and document tests, inspections and systems startup, as per the Commissioning Plan.

J. Maintain an Issues Log and a record of functional testing. Report all Issues as they occur to the Commissioner.

K. Compile test data, inspection reports and certificates, and include them in the systems manual and Commissioning Report.

L. Certify date of acceptance and startup for each item of equipment for start of warranty periods.

M. Review and comment on operation and maintenance documentation and systems manual outline for compliance with the OPR, BOD, and Contract Documents. Operation and maintenance documentation requirements are specified in other sections of the Project Specifications and described in Section 01 78 39 CONTRACT RECORD DOCUMENTS.

N. Review agenda for orientation; witness and confirm orientation session conforms with agenda and Contract Documents; review recording of demonstration and orientation sessions provided by the Contractor on USB drive or other electronic media as requested by the Commissioner and provide appropriate comments for editing.

O. Return to the site ten (10) months into the twelve (12)-month guaranty period, to review with facility staff the current building operation and the condition of outstanding Issues related to the original and seasonal commissioning. Interview facility staff and identify problems or concerns they have with operating the building as originally intended.

P. Prepare Commissioning Reports.

Q. Assemble the final commissioning documentation, including the Commissioning Report and Systems Manual.

R. Perform all CxA tasks as defined by LEED and the NYC Energy Conservation Code; prepare LEED submittal documents and preliminary and final Commissioning Reports as required by the NYC Energy Conservation Code.

1.9 COMMISSIONING DOCUMENTATION:

The Contractor must assist the CxA in the development and compiling of the following Commissioning Documentation:

A. Index of Commissioning Documents: The CxA will prepare an index including the storage location of each document.

B. Commissioning Plan: A document prepared by the CxA that outlines the schedule, allocation of resources, roles and responsibilities, and documentation requirements of the Commissioning process.

C. Test Checklists: The CxA will develop test checklists for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for comments, for each item to be tested. The CxA will prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. Space will be provided for testing personnel to sign off on each checklist. Specific checklist content requirements are specified in other sections of the Project Specifications, but must include without limitation:

1. Identification of tested item
2. Date of test
3. Indication of whether the record is for a first test or retest following correction of a problem or Issue
4. Dated signatures of the person performing the test and of the witness if applicable
5. Deficiencies and Issues, if any, generated as a result of the test

D. Inspection Checklists will be signed by the Contractor, Subcontractor(s), Installer(s), and CxA certifying that systems, subsystems, equipment, and associated controls are ready for testing.

E. Test and Inspection Reports: The CxA will record test data, observations, and measurements on test checklists. Photographs, forms, and other means appropriate for the application will be included with data. CxA must compile test and inspection reports and test and inspection certificates and include them in systems manual and Commissioning Report.

F. Corrective Action Documents: The CxA will document corrective action taken for systems and equipment that fail tests and include required modifications to systems and equipment and revisions to test procedures, if any. The Contractor must retest systems and equipment requiring corrective action. The CxA will document retest results.

G. Issues Log: The CxA will prepare and maintain an Issues Log that describes design, installation, and performance Issues that are at variance with the OPR, BOD, and Contract Documents. The log will identify and track Issues as they are encountered, documenting the status of unresolved and resolved Issues. The Issues Log will identify, at a minimum:

1. The party responsible for correcting the Issue,
2. The person documenting the Issue resolution,
3. The exact location of the Issue (floor and room),
4. The applicable system component,
5. A detailed description of the Issue,
6. The Issue status, and
7. The date the Issue was discovered and the date the Issue was resolved.

H. Commissioning Report: The CxA will document results of the commissioning process including unresolved Issues and performance of systems, subsystems, and equipment. The Commissioning Report will indicate whether systems, subsystems, and equipment have been completed and are performing according to the OPR, BOD, and Contract Documents. The Commissioning Report must include:

1. An executive summary, including participants and their roles, a brief building description, an overview of the commissioning and testing scope, and a general description of testing and verification methods,
2. Installation/Pre-Functional Checklists,
3. Start-up reports,
4. Functional Test documentation,
5. Trend Log Analysis,
6. The final Issues Log, with all Issues identified through the commissioning process, identifying which, if any, Issues remain unresolved,
7. The Commissioning Plan,
8. Commissioning progress and field reports,
9. Commissioning review documents, and
10. Record of owner’s orientation.

I. Systems Manual: The CxA will gather required information and compile systems manual as specified in other sections of the Project Specifications and described in Section 01 78 39 CONTRACT RECORD DOCUMENTS.

1.10 SUBMITTALS:

A. Submittal of shop drawings, product data, samples, etc., relevant to commissioning must be provided to the CxA as requested. Such submittals must be in compliance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. As-Built Contract Record Drawings and Operating and Maintenance Manuals relevant to commissioning must be provided to the CxA as requested. Such submittals must be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.

C. All demonstration and orientation submittals relevant to commissioning must be provided to the CxA as requested. Such submittals must be in compliance with Section 01 79 00 DEMONSTRATION AND OWNER'S PREACCEPTANCE ORIENTATION.

D. Completed Prefunctional (Installation) Checklists must be provided to the CxA prior to equipment startup.

1.11 COORDINATION:

A. Coordination of Commissioning is the responsibility of all Commissioning Team members.

B. Coordinating Meetings: The CxA will coordinate with the Commissioner's regularly scheduled construction progress meetings to conduct coordination meetings of the Commissioning Team to review progress on the Commissioning Plan, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities. Commissioner and Contractor must ensure that all required Commissioning Team members attend.

C. Construction Documents: The Contractor, through the Commissioner, will furnish copies of all construction documents, addenda, change orders and appropriate submittals and shop drawings to the CxA.

D. Pre-testing Meetings: The CxA will coordinate with the Commissioner to conduct pretest meetings of the Commissioning Team to review startup reports, pretest inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested. Commissioner and Contractor must ensure that all required Commissioning Team members attend.

E. Testing Coordination: Contractor must coordinate schedule times with the Commissioning Team, through the Commissioner, for tests, inspections, obtaining samples, and similar activities. The CxA will advise the Commissioning Team as to the sequence of testing activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

F. Manufacturers' Field Services: The Contractor must coordinate manufacturers' field services, as per the Commissioning Plan.

G. The CxA will regularly apprise the Commissioner of progress, pending problems and/or disputes, as well as provide regular status reports on progress with each system.

PART II – PRODUCTS

2.1 TEST EQUIPMENT

A. All industry standard test equipment required for performing the specific tests must be provided by the Contractor responsible for testing. Any proprietary Vendor-specific test equipment must be provided by that Vendor or Manufacturer.

B. Special equipment, tools, instruments, software, and equipment communication network access hardware and software (only available from Vendor, specific to the piece of equipment) required for testing equipment according to the Contract Documents must be included at no extra cost to the City and must be turned over

to the City at Project close-out, except for stand-alone data logging equipment that may be used by the CxA.

C. Any portable or handheld setup and/or calibration devices required to initialize the control system must be made available by the control vendor for use by the CxA at no additional cost to the City.

D. The instrumentation used in the commissioning process must comply with the following:

1. Be of sufficient quality and accuracy to test and/or measure system performance within the tolerances required
2. Be calibrated at the manufacturer's recommended intervals with calibration tags permanently affixed to the instrument
3. Be maintained in good repair and operating condition throughout use duration on this Project
4. Be immediately recalibrated or repaired if dropped and/or damaged in any way during this Project.

PART III – EXECUTION

3.1 COMMISSIONING PROCESS

A. The following provides an overview of the Commissioning tasks during Project construction and the general order in which they occur.

1. Construction-phase Commissioning begins with a Commissioning Kickoff Meeting, conducted by the CxA through the Commissioner in accordance with section 01 31 00 PROJECT MANAGEMENT AND COORDINATION, where the Commissioning process is reviewed with all the Commissioning Team Members.
2. Additional meetings may be required throughout construction, scheduled by the CxA through the Commissioner in accordance with 01 31 00 PROJECT MANAGEMENT AND COORDINATION with necessary parties attending, to plan, scope, coordinate and schedule future activities and resolve open Issues.
3. The CxA will review the Contractor submittals concurrent with the Commissioner and provide comments to the Commissioner for inclusion in their review. The reviewed submittals will include all commissioned equipment information, including detailed startup procedures, and coordination drawings that include commissioned equipment and systems, control drawings and sequences, and interfaces and interlocks between systems.
4. The CxA works with the Commissioner and Contractor in developing Pre-functional and Functional Test documentation formats.
5. Periodically throughout the construction process, the CxA will perform site visits to observe component and system installations.
6. The checkout and performance verification generally proceeds from component level to equipment to systems and intersystem levels. Pre-functional (Installation) Checklists are to be completed before equipment startup. Equipment startup must be completed before TAB. TAB must be completed before the Functional Performance Checklists.
7. The Contractor must, with guidance from the CxA, execute and document the Pre-Functional (Installation) Checklists and perform startup and initial checkout of equipment and systems. The CxA documents that the checklists and startup are completed according to the approved plans. This will include the CxA witnessing selected assembly markups, portions of the startup of selected equipment, and spot checking the Pre-Functional (Installation) Checklists.
8. The CxA develops specific equipment and system Functional Checklists. The Contractor receives a copy of the procedure through the Commissioner. The CxA may request additional design

narrative from the Commissioner and Controls Contractor, depending on the completeness of the Basis of Design and sequences provided within the design documents.

9. The Functional Checklists are executed by the Contractor and witnessed and documented by the CxA.

10. Items of non-compliance in material, installation startup, and operation are corrected and the equipment or system is rechecked. The CxA will maintain an Issues Log to track Issues and Issue resolution.

11. The CxA will review the Operation & Maintenance documentation for completeness.

12. Commissioning, excluding the Warranty Walkthrough and any seasonal testing at the written direction of the Commissioner, must be completed prior to Substantial Completion.

13. The CxA reviews the orientation documentation. The orientation schedules and agenda are provided by the subcontractors. The CxA verifies that orientation is completed, attended by the appropriate City of New York personnel, is thorough and provides all necessary information required to operate and service the equipment or system.

14. Deferred testing/checkouts are conducted, as specified or required in the Contract Documents.

3.2 COMMISSIONING PLAN AND SCHEDULE

A. Commissioning Plan: The Commissioning Plan provides guidance in the execution of the commissioning process. After the initial construction phase Commissioning kickoff meeting, the CxA will update the plan. This plan is a living document that must evolve and expand as the Project progresses. The Commissioning Plan must include:

1. Description of the facility and Project.
2. Description of the commissioning process and associated deliverable documents.
3. Description of equipment and systems to be commissioned.
4. Description of schedules for testing procedures along with identification of parties involved in performing and verifying tests.
5. Sample rates for equipment to be tested.
6. Identification of task items that must be completed before the next operation can proceed.
7. Description of responsibilities of Commissioning Team members.
8. Description of observations to be made and reported on during testing and witnessing of testing by all parties involved in the Project.

B. Commissioning Schedule: Contractor must provide construction schedules to the CxA, in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION. The CxA will develop and submit a schedule identifying the commissioning process and provide commissioning scheduling information to the Commissioner and Contractor for review and planning activities. The Contractor must incorporate the CxA's activities into the Project schedule.

3.3 TESTING PROCEDURES

A. The CxA will determine and document the acceptance procedures for each system within disciplines. The acceptance procedures must incorporate the commissioning standards and successful testing results as referred to throughout the Specifications.

B. The CxA will provide performance checklists and performance checkout data sheets for each system based on actual system configuration. Special emphasis must be placed on checkout procedures that must conclusively determine actual system performance and compliance with the OPR and BoD.

C. The Contractor and appropriate Vendor(s) must be informed of what tests are to be performed and the expected results. The Commissioning Plan must address the test requirements and be distributed to all parties involved with that system.

D. Prior to Functional Testing, the Contractor must provide the following:

1. Contractor must certify in writing that commissioned systems, subsystems, and equipment have been installed, calibrated and started, and are operating according to the Contract Documents.

2. Contractor must certify in writing that all relevant instrumentation and control systems have been completed and calibrated; are operating according to the Contract Documents; and that pretest set points have been recorded.

3. Contractor must certify in writing that TAB procedures have been completed, and that the TAB report has been submitted, discrepancies corrected, and corrective work approved.

4. Contractor must perform tests for system and intersystem performance only after CxA and Commissioner have approved the completed testing checklists for systems, subsystems, and equipment.

E. The Functional Performance tests must be performed by the Contractor and Vendor(s) with oversight by the CxA. The CxA must witness, verify, and document these tests.

1. Functional Performance Tests must include operating the systems and components through each of the written sequences of operation, other significant modes of miscellaneous alarms, power failure, and security alarm when impacted by and interlocked with commissioned equipment, as detailed in the Commissioning Plan.

2. Checklists must be completed comprehensively and to the extent necessary to enable the CxA to assure the Commissioner that the systems perform as per the OPR, BOD, and Contract Documents.

3. If a test is failed for any reason and retesting is required, the Contractor must provide retesting at no additional cost to the City.

4. If a test must be witnessed more than twice by the Commissioning Agent due to repeated failure to perform as per the design documents, the Contractor must be responsible for the Commissioning Agent’s fee for witnessing repeated tests beyond the second incidence. Such fee will be negotiated between the Commissioning Agent and the Commissioner.

5. After testing, Contractor must return settings to normal operating conditions.

3.4 OPERATION & MAINTENANCE MANUALS

A. General

1. The CxA must review the Operation & Maintenance manuals provided by the Contractor for completeness of the document. The review process will verify that Operation & Maintenance instructions meet Specifications and are included for all commissioned equipment furnished by the Contractor.

2. Published literature will be specifically oriented to the provided equipment, indicating required operation and maintenance procedures, parts lists, assembly / disassembly diagrams and related information.

3. The Contractor must incorporate the standard technical literature into system-specific formats for this facility as designed and as actually installed. The resulting Operation & Maintenance information must be system-specific, concise, to the point and tailored specifically to this facility. The CxA must review these documents as necessary for final corrections by the Contractor.

4. Contractor must submit Operations & Maintenance Manuals for each piece of equipment for review no later than 45 days after submittal approval.

B. The Operation & Maintenance Manual review and coordination efforts must be completed prior to Owner orientation sessions, as these documents are to be utilized in the orientation sessions.

C. System Operations Manual

1. The CxA must prepare and deliver these documents with inputs from the Contractor. The Contractor must provide all required documents to the CxA, through the Commissioner. The required documents must be described in the Commissioning Plan and Contract Documents. Typically, the manual includes the following:

   a. System, subsystem, and equipment descriptions
   b. Commissioned systems single line diagrams (to be provided by Mechanical, Electrical, Plumbing, and Building Management System (BMS) subcontractors).
   c. As built sequences of operations, control drawings and original set points (to be provided by Design Consultant and BMS subcontractor).
   d. Operating instructions for integrated building systems (to be provided by Mechanical and BMS subcontractors).
   e. Recommended schedule of maintenance requirements and frequency (to be provided by subcontractors).
   f. Recommended schedule for calibrating sensors and actuators (to be provided by BMS subcontractor).

3.5 DEMONSTRATION AND INSTRUCTION

A. The Contractor must schedule and coordinate instruction sessions for the facility's staff for each commissioned system. Demonstrations must be held per Contract Documents, along with the appropriate schematics, handouts and visual / audio orientation aids onsite with equipment.

B. The equipment vendors must provide instruction on the specifics of each major equipment item including philosophy, troubleshooting and repair techniques.

C. The Contractor must record and edit demonstration and orientation sessions, and provide these records to the CxA, through the Commissioner.

D. For additional direction pertinent to instruction, refer to other specific divisions for demonstration and instruction requirements.

3.6 WARRANTY REVIEW / SEASONAL TESTING

A. The CxA will return upon the start of the new season (cooling or heating) after Project completion to conduct performance tests that could not be performed due to ambient conditions. The seasonal testing will only be performed if suitable loads / conditions were unavailable during the performance testing stages (in other words; the requirement for testing is warranted), and at the written direction of the Commissioner.

B. The CxA will return to the site approximately ten (10) months into the twelve (12)-month guaranty period and interview the occupants and maintenance staff, review the operation of the building, provide recommendations for installation and operational problems and document warranty and operational Issues in the Issues database.

3.7 RECORD DRAWINGS

A. The CxA must review the as built Contract Documents to verify incorporation of both design changes and as-built construction details. Discrepancies noted must be corrected by the appropriate party.

END OF SECTION 01 91 13

(No Text on This Page)

SECTION 01 91 15
GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 91 15

PART I – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. The Owner's Project Requirements (OPR) and Basis of Design (BOD) documents are included by reference for information only.

C. The Commissioning Plan, prepared by the Commissioning Agent (CxA) under separate contract with the City of New York, contains requirements that apply to this section.

1.2 SECTION INCLUDES

A. This section includes the commissioning requirements for the Building Enclosure systems. Refer to "Exterior Enclosure Commissioning" in other sections of the Project Specifications for specific requirements regarding Building Enclosure Commissioning.

1. The commissioning requirements for the Building Enclosure systems given in this section are entirely separate from, and in addition to, the Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for this Project. The Contractor, and his/her Suppliers, Subcontractors, Vendors, etc., are required to participate in both commissioning processes as required.

1.3 DESCRIPTION

A. Building Enclosure Commissioning (BECx) is a systematic process of ensuring all building enclosure systems responsible for environmental separation perform as per the OPR and BOD. The BECx process is intended to verify and document proper installation and performance of building enclosure materials and systems in accordance with the Contract Documents.

B. Commissioning does not take away from, or reduce, the Contractor's responsibility to provide a finished and fully functioning product and installation.

C. This section will in no way diminish the responsibility of the Contractor in performing all aspects of work and testing as outlined in the Contract Documents. Any requirements outlined in this section are in addition to requirements outlined in the Contract Drawings and Specifications.

1.4 RELATED WORK

A. Specific BECx requirements are given in this Section. The following Project Specification sections are related to the commissioning work specified in this section:

1. Basic Concrete Requirements: Refer to Division 03
2. Basic Metal Requirements: Refer to Division 05
3. Basic Waterproofing, Roofing, Air Barrier and Insulation Requirements: Refer to Division 07
4. Basic Fenestrations Requirements: Refer to Division 08
5. Basic Finishing Requirements: Refer to Division 09

1.5 DEFINITIONS AND ABBREVIATIONS

A. Refer to Article 2 of the Contract and Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for terms, words, and expressions not otherwise defined herein.

Approval	Acceptance that a material or system has been properly installed and is functioning in tested modes according to the Contract Documents.
Building Enclosure Commissioning Agent (BECA)	BECA directs and coordinates day-to-day BECx commissioning activities.
Building Enclosure Testing Agency (BETA)	Building Enclosure Testing Agency whom is an independent agency retained by the Contractor and approved by the Commissioner, fully accredited by the appropriate governing body for each of the materials, components or systems to be tested or evaluated for compliance with requirements of the Contract Documents and as directed by the BECA. Documentation of such certification must be submitted to and approved by the Commissioner prior to the start of any work by the BETA.
Commissioning	Commissioning is a systematic process of ensuring and documenting that the building systems have been installed in the prescribed manner, are functionally checked and capable of being operated and maintained to perform with the design intent, and have documentation to support proper installation and operation. The process does not eliminate or reduce the responsibility of the installing subcontractors to provide a finished product.
Commissioning Agent (CxA)	Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
Commissioning Plan	Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
Deficiency	Condition of a building enclosure material or system that is not in compliance with Contract Documents (that is, does not perform properly or does not comply with design intent).
Design Consultant	Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
Simulated Condition	Condition created for testing component or system (e.g., applying pressure differential across the building enclosure concurrent with water spray to simulate a wind driven rain).
Mock-up	The activities where systems or materials are initially constructed and tested.

1.6 COORDINATION

A. Building Enclosure Commissioning Team: Members of the Building Enclosure Commissioning Team will consist of:

1. CxA
2. BECA
3. BETA
4. Commissioner
5. Contractor, and all Building Enclosure Subcontractors
6. Design Consultant

B. Management: City of New York will contract services of the BECA through a separate contract. The BECA will direct and coordinate commissioning activities and report to the Commissioner. All members of the

Building Enclosure Commissioning Team must cooperate to fulfill contracted responsibilities and objectives of the Contract Documents.

C. Scheduling: BECA must work with the Building Enclosure Commissioning Team to establish required commissioning activities to incorporate into the preliminary commissioning schedule. The Contractor must integrate commissioning activities into master construction schedule, in accordance with Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION. Necessary notifications are to be made in a timely manner in order to expedite commissioning.

1.7 SUBMITTALS

A. Contractor must provide documentation required for commissioning work in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. At minimum, documentation must include, but not be limited to:

1. Submittal of shop drawings, product data, samples, etc., relevant to BECx and as requested by the BECA. Such submittals must be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
2. As-Built Record Drawings and Operation and Maintenance Information relevant to BECx and as required by the BECA. Such submittals must be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
3. All demonstration and orientation submittals relevant to BECx and as requested by the BECA. Such submittals must be in compliance with Section 01 79 00 DEMONSTRATION AND OWNER'S PREACCEPTANCE ORIENTATION.
4. Performance data, any performance test procedures, and installation and checkout materials.

B. The Contractor must provide all submittals to the Design Consultant, as per Section 01 33 00 SUBMITTAL PROCEDURES. The Design Consultant will transmit all building enclosure related submittals to the BECA for concurrent review.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 SYSTEMS TO BE COMMISSIONED

A. Building Enclosure systems to be commissioned may include, but are not limited to, Roof waterproofing, including garden roof systems, all penetrations, and transitions; skylights and other sloped glazing; exterior walls, including the air barrier system, water management systems, and thermal insulation; punched windows, window walls, curtain walls, storefronts, glazed entries, doors, and louvers; sealants, expansion joints, and control joints; flashings, including all transitions and end-dams; terrace, balcony, and deck waterproofing; below-grade waterproofing, including drainage, waterproofing and damp proofing; below slab floor barriers; interface and transition conditions between exterior enclosure components and systems; smoke controls and fire separation and stopping; and any other special building enclosure systems, equipment, and controls. Refer to the Contract Documents for clarity.

3.2 RESPONSIBILITIES OF COMMISSIONING TEAM MEMBERS DURING CONSTRUCTION PHASE

A. Responsibilities of the Design Consultant include without limitation the following:

1. Review BECA comments on construction documents and shop drawings.
2. Assist in dispute resolution regarding building enclosure items.
3. Review BECA reports.
4. Incorporate BECA Submittal Review Comments into response on submittals.

B. Responsibilities of the BECA include the following without limitation:

1. Review and comment on Mock-up construction and testing plan as provided by Contractor.
2. Development of BECx Plan.
3. Review of building enclosure shop drawings and submittals, including “approved equal” requests, through the Commissioner in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.
4. Attend combined pre-construction and BECx kick-off meeting.
5. Develop construction checklists for the building enclosure for the Contractor’s use.
6. Observe the construction of a building enclosure Mock-up.
7. Witness the testing of a building enclosure Mock-up.
8. Project meetings / conference calls / coordination.
9. Field monitor installation of exterior enclosure components.
10. Update field report log.
11. Update BECx Plan.
12. Advise on Requests for Information.
13. Assist with the preparation of LEED paperwork.
14. Prepare systems manual, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
15. Complete Maintenance Plan, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
16. Prepare training manual, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
17. Prepare final BECx record and enclosure commissioning close-out documents.
18. Develop on-going BECx Plan.

C. Responsibilities of the Contractor and Building Enclosure Subcontractors include without limitation the following:

1. Review BECx Plan and FPT specification.
2. Attend commissioning kick-off meeting and other Building Enclosure Commissioning Team meetings.
3. Incorporate commissioning activities into the construction schedule.
4. Periodically update Commissioning activities in the construction schedule.
5. Notify Commissioner and BECA of work completion.
6. Verify building enclosure materials and assemblies are ready for functional testing.
7. Retain the services of an approved independent BETA; submit qualifications of independent BETA to Commissioner for approval; coordinate all activities and deliverables of this BETA; ensure all BETA deliverables are provided to the Building Enclosure Commissioning Team.
8. Attend all required material and systems testing.
9. Execute all periodic maintenance or repairs required on started systems from initial Mock-up of equipment to Final Acceptance by Commissioner to prevent material warranties from being voided.
10. Submit maintenance logs of all interim maintenance or repair tasks performed by Contractor.

11. Ensure installation work is complete, is in compliance with Contract Documents, and is ready for Functional Performance Testing. FPT test results will be documented by BECA.
12. Ensure resolution of non-compliance and deficiencies in construction or test results. Obtain written documentation of completion from the appropriate subcontractors.
13. Provide letters of compatibility for adjacent building enclosure materials and assemblies.
14. Facilitate all repairs and retesting of failed condition at no additional cost to the City of New York.
15. Provide all warranty information to BECA.

D. Responsibilities of the BETA include without limitation the following:

1. Attend Commissioning kick-off meeting and other Building Enclosure Commissioning Team meetings.
2. Provide on-site technician and equipment to complete Mock-up and field Functional Performance Testing.
3. Prepare and submit reports to the Commissioner at the conclusion of all testing.
4. Perform retesting and prepare corresponding reports.

3.3 BUILDING ENCLOSURE COMMISSIONING TEAM (BECx) MEETINGS

A. BECx meetings will be held periodically, as determined by the Commissioner and recommended by BECA.

B. Discussions held in BECx meetings must include, but not be limited to: system/materials, mock-up/field, progress, scheduling, testing, documentation, deficiencies, and problem resolution.

C. The Contractor must attend BECx meetings, and must ensure the attendance of required subcontractors, as requested.

3.4 REPORTING

A. BECA will provide status reports to the Commissioner. The Commissioner will provide such status reports to the 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

(No Text on This Page)

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

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

Department of Design and Construction

Contract for Furnishing all Labor and Material Necessary

Contractor

Dated _____ , 20 _____

Approved as to Form
Certified as to Legal Authority

Acting Corporation Counsel

Dated _____ , 20 _____

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____ , 20 _____

FMS ID: **LBC16MPHC**

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS
30-30 THOMSON AVENUE LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000 WEBSITE www.nyc.gov/buildnyc

Department of Design and Construction

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

Mapleton Branch Library HVAC Replacement

LOCATION: **1702 60th Street**
BOROUGH: **Brooklyn, NY 11211**
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: **LBC16MPHC**

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

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

VOLUME 3 OF 3

ADDENDUM TO THE GENERAL CONDITIONS

SPECIFICATIONS

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

Mapleton Branch Library HVAC Replacement

LOCATION: **1702 60th Street**
BOROUGH: **Brooklyn, NY 11211**
CITY OF NEW YORK

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

Brooklyn Public Library

Loring Consulting Engineers, Inc.

Date: **November 3, 2022**

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

ADDENDA CONTROL SHEET

BID SUBMISSION DATE/ TIME: February 22, 2023; between 11:30am and 2:00pm
BID OPENING DATE/ TIME: February 22, 2023; 2:30pm

PROJECT No. : **LBC16MPHC**

TITLE: **Mapleton Branch Library HVAC Replacement**

ADDENDA ISSUED	NO. OF DWG	DATE	APPROVED BY: ARCHITECTURE/ ENGINEERING	GENERAL COUNSEL
#1 Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		2/9/23	Sarah Zomick	2/9/2023

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

February 9, 2023

ADDENDUM No. # 1

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

85023B0033 – LBC16MPHC

Mapleton Branch Library HVAC Replacement

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

The bidder is advised that the items listed below apply to the project:

1. **Bidders Questions and Responses to Questions:**
   See Attachment A.

2. **Revisions to Documents:**
   See Attachment B.

3. **Revisions to PASSPort forms:**
   See Attachment C.

Transferring Data Between Rounds of an RFX: A new document titled "Transferring Data Between Rounds of an RFX" has been added to the Documents section of the View RFx tab. Please refer to this document when an addendum has been issued. Note: Whenever an addendum is issued, the RFX item grid will be cleared. You can import the work you have already done by following the steps on this document.

DDC strongly advises vendors to finalize and submit bids 48 hours prior to due date and time. The City is not responsible for technical issues (e.g. internet connection, power outages, technology malfunction, computer errors, etc.) related to bid submissions.

If additional information is required, please contact the Department of Design and Construction, Contract Section at (718) 391-1041 or by email at CSB_projectinquiries@ddc.nyc.gov.

Richard Jones, PE CWI
Executive Director, Specifications

DDC PROJECT #: **LBC16MPHC**

PROJECT NAME: **Mapleton Branch Library HVAC Replacement**

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

No.	Bidders Questions	DDC Responses
1	The bid documents list Honeywell as proprietary for Temperature Controls. Who is the person at Honeywell who is responsible for this project?	This is a new system with no existing vendor at this site. Honeywell is the proprietary temperature controls manufacturer. Refer to section 230923 Direct Digital Control System for HVAC for further information.
2	Volume 2, 'Safety Requirements for Construction Contracts,' p.3 mentions a Safety Representative. We assume our Project manager can fulfill this role. Please confirm.	The project manager may be submitted as the Project Safety Representative.
3	We assume a sidewalk shed is not required on this project. Please confirm.	Confirmed. A sidewalk shed is not required on this project.
4	We assume the Library will be responsible for moving or protecting furniture and books. Please confirm.	Confirmed. The Library, not the Contractor, will be responsible for moving or protecting furniture and books.
5	There is a specification for Sound Traps 230548-10 yet none are shown we assume this spec. is not applicable please confirm.	Sound Traps are not required; see updated specification section 230548, included with this Addendum.
6	Drawing A204 shows a roof access path. We assume this is existing. Please confirm.	No, the path is not existing (since the new equipment has not been installed). The path represents unobstructed path for FDNY access.
7	Drawing M601 shows a detail for a concrete roof pedestal; however, nothing is indicated on the drawings. We assume this is not applicable. Please confirm.	This detail is applicable for the roof mounted duct support.
8	Drawing M605 shows a detail for a refrigerant pipe enclosure. Please advise if this is applicable.	Yes, this is required for long refrigerant runs on roof.
9	Please confirm the Library will be closed during construction.	Confirmed. The Library will be closed during construction.
10	The refrigeration piping for the HRIU units is not shown on Drawings M201 or M203. Please provide.	The Pipe sizes and routing is shown on the Refrigerant piping schematic sheet M-402. Refer to M200 series for indoor unit and pipe penetration locations.

DDC PROJECT #: **LBC16MPHC**

PROJECT NAME: **Mapleton Branch Library HVAC Replacement**

ATTACHMENT B – REVISIONS TO THE DOCUMENTS

Revisions to Volume 3:

- Specification Section 230548 “Noise and Vibration Controls for HVAC Piping and Equipment” has been updated to remove requirements for Sound Traps.

DDC PROJECT #: **LBC16MPHC**

PROJECT NAME: **Mapleton Branch Library HVAC Replacement**

ATTACHMENT C – REVISIONS TO PASSPORT FORMS

This Addendum initiates Round 2 of the procurement.

Please note that numbering of addenda is independent of rounds.

Questionnaire Changes:

None

Item Grid Changes:

None

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

ADDENDA CONTROL SHEET

BID SUBMISSION DATE/ TIME: March 14, 2023; between 11:30am and 2:00pm
BID OPENING DATE/ TIME: March 14, 2023; 2:30pm

PROJECT No. : **LBC16MPHC**

TITLE: **Mapleton Branch Library HVAC Replacement**

ADDENDA ISSUED	NO. OF DWG	DATE	APPROVED BY: ARCHITECTURE/ ENGINEERING	GENERAL COUNSEL
#1 Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		2/9/23		
#2 Revised Bid Opening Date		2/15/23	SZ	NA

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

February 15, 2023

ADDENDUM No. # 2

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

85023B0033 – LBC16MPHC

Mapleton Branch Library HVAC Replacement

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

The bidder is advised that the items listed below apply to the project:

1. **The Bid Opening for the contract described below scheduled for February 22, 2022, at 2:30 pm is rescheduled to March 14, 2023 at 2:30 pm.**

   Contract #1 – General Construction Work

2. **Bidders Questions and Responses to Questions:**
   See Attachment A (Not Used)

3. **Revisions to Documents:**
   See Attachment B (Not Used)

4. **Revisions to PASSPort forms:**
   See Attachment C (Not Used)

DDC strongly advises vendors to finalize and submit bids 48 hours prior to due date and time. The City is not responsible for technical issues (e.g. internet connection, power outages, technology malfunction, computer errors, etc.) related to bid submissions.

If additional information is required, please contact the Department of Design and Construction, Contract Section at (718) 391-1041 or by email at CSB_projectinquiries@ddc.nyc.gov.

Richard Jones, PE CWI
Executive Director, Specifications

DDC PROJECT #: **LBC16MPHC**

PROJECT NAME: **Mapleton Branch Library HVAC Replacement**

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

NOT USED

DDC PROJECT #: **LBC16MPHC**

PROJECT NAME: **Mapleton Branch Library HVAC Replacement**

ATTACHMENT B – REVISIONS TO THE DOCUMENTS

NOT USED

DDC PROJECT #: **LBC16MPHC**

PROJECT NAME: **Mapleton Branch Library HVAC Replacement**

ATTACHMENT C – REVISIONS TO PASSPORT FORMS

This Addendum is included within Round 2 of the procurement.

Please note that numbering of addenda is independent of rounds.

Bid Opening Date Changes:

The Bid Opening scheduled for February 22, 2023 at 2:30pm is rescheduled for March 14, 2023 at 2:30pm.

Questionnaire Changes:

None

Item Grid Changes:

None

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

ADDENDA CONTROL SHEET

BID SUBMISSION DATE/ TIME: March 21, 2023; between 11:30am and 2:00pm
BID OPENING DATE/ TIME: March 21, 2023; 2:30pm

PROJECT No. : **LBC16MPHC**

TITLE: **Mapleton Branch Library HVAC Replacement**

ADDENDA ISSUED	NO. OF DWG	DATE	APPROVED BY: ARCHITECTURE/ ENGINEERING	GENERAL COUNSEL
#1 Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		2/9/23		
#2 Revised Bid Opening Date		2/15/23		
#3 Revised Bid Opening Date; Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		3/8/23	Sarah Zomick	

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

March 8, 2023

ADDENDUM No. # 3

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

85023B0033 – LBC16MPHC

Mapleton Branch Library HVAC Replacement

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

The bidder is advised that the items listed below apply to the project:

1. **The Bid Opening for the contract described below scheduled for March 14, 2022, at 2:30 pm is rescheduled to March 21, 2023 at 2:30 pm.**
   Contract #1 – General Construction Work
2. **Bidders Questions and Responses to Questions:**
   See Attachment A
3. **Revisions to Documents:**
   See Attachment B
4. **Revisions to PASSPort forms:**
   See Attachment C

Transferring Data Between Rounds of an RFX: A new document titled "Transferring Data Between Rounds of an RFX" has been added to the Documents section of the View RFx tab. Please refer to this document when an addendum has been issued. Note: Whenever an addendum is issued, the RFX item grid will be cleared. You can import the work you have already done by following the steps on this document.

DDC strongly advises vendors to finalize and submit bids 48 hours prior to due date and time. The City is not responsible for technical issues (e.g. internet connection, power outages, technology malfunction, computer errors, etc.) related to bid submissions.

If additional information is required, please contact the Department of Design and Construction, Contract Section at (718) 391-1041 or by email at CSB_projectinquiries@ddc.nyc.gov.

Richard Jones, PE CWI
Executive Director, Specifications

DDC PROJECT #: **LBC16MPHC**

PROJECT NAME: **Mapleton Branch Library – HVAC Upgrade**

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

DDC Response to Bidder's Questions in Addendum 1 are hereby revised as follows:

No.	Bidders Questions	DDC Revised Responses
4	We assume the Library will be moving or protecting Furniture and Books. Please confirm.	The Contractor will be responsible for moving and protecting furniture and bookshelves. The Library will move the books themselves as needed.

New Bidder's Questions and DDC Responses:

No.	Bidders Questions	DDC Responses
1	There is a discrepancy between the Architectural Drawings and Structural Drawings. The Architectural Drawings and Structural Drawings disagree on the number and location of the W6x16 post for the sound barrier. Please advise.	Follow the Structural Drawings for the number and location of the post for sound barrier. Also, refer to updated Drawings, included with this Addendum.
2	The post layout on the Structural Drawings will create straight walls. Please clarify.	Note all posts must be mounted from the W6x15 steel member as per associated detail in 6 & 8/S104.
3	General Requirement Note P on Drawing T-002 indicates to perform all work in a manner that preserves the existing roof warranty. Please provide details on the roof warranty. How many years are left and who is the manufacturer?	There is no current roof warranty. This note has been removed. Refer to updated Drawings, included with this Addendum.
4	General Requirement Note T on Drawing T-002 indicates noisy work will be performed after hours. Is this applicable if the library will be closed per Addendum #1?	This note is not applicable and has been removed. Refer to updated Drawings, included with this Addendum.
5	The new acoustical barrier wall description on Drawing A-204 indicates that the height is approximately 11" above roof. Is this correct?	Note has been modified to read 11' above roof. Refer to updated Drawings, included with this Addendum.
6	Demolition Plan Note 1 on Drawing A-204 indicates to see DM-101. Please provide Drawing DM-101.	Note has been modified to read A-101. Refer to updated Drawings, included with this Addendum.

7	Coordination Note 2 on Drawing FA-001 indicates that DDC and BPL may request to relocate some system components in order to reduce the negative visual impact on the building's historic or architectural character. However, the Addendum to General Conditions indicates that historical treatment procedures are not applicable. Please advise if this is a landmark building.	Correct, this is not a landmark building.
8	We would like to get the plan holder list for the project mentioned above.	The list of Approved Vendors for the DDC Pre-Qualified List, PQL000120 – General Construction Medium Projects is available via the NYC PASSPort Procurement and Sourcing Solutions Portal: https://passport.cityofnewyork.us/page.aspx/en/sup/pql_manage_public/121 Click on the number of Approved Vendors to open the list.
9	Re: Drawing A-204, the installation of W4x13 roof beams are given in the notes, but on S-104 W6x15 roof beams are shown. Please clarify which type of beam to take for bidding purpose?	Use W6x15 as indicated on structural drawings. Also, refer to updated Drawings, included with this Addendum.
10	DDC General Conditions, Section 015000-15 Paragraph 3.8A.5 calls for providing Computers as per 3.8 B3-b yet addendum to general conditions page 4 indicates 3.8 B3-b Does Not Apply. We assume computers are not applicable. Please confirm.	Computers will be required, as noted in the Section 015000 3.8A5 and 3.8B3a, since this is a DDC Managed Project.
11	DDC General Conditions, Section 015000-23 Paragraph 3.14 calls for Rodent Control. We assume this section is not applicable for this contract, since it is an existing building and we are not doing and exterior openings. Please confirm.	Rodent Control may be applicable, as determined by the Commissioner.
12	Key Note 1 on Drawing M-104 indicates that fireproofing and concrete casing will be replaced/repaired at all locations where disturbed, damaged or removed by the demolition scope. Please provide an allowance for this work since the extent cannot be determined from the Drawings.	This note has been removed. Refer to updated Drawings, included with this Addendum.
13	Honeywell International cannot provide WEBs-8000 but can provide CP-Jace. Will that be acceptable? Since this is a new system it shouldn't really matter what type of Jace is used, but we need in writing that DDC and BPL approves us using Honeywell CP-Jace instead of the Honeywell WEBs-8000. Please confirm.	WEBs-8000, as specified in the Contract Documents, is currently available. Substitutions are not permitted.

DDC PROJECT #: **LBC16MPHC**

PROJECT NAME: **Mapleton Branch Library – HVAC Upgrade**

ATTACHMENT B – REVISIONS TO THE DOCUMENTS

Revisions to the Drawings:

1. M-104
2. T-002
3. A-204

DDC PROJECT #: **LBC16MPHC**

PROJECT NAME: **Mapleton Branch Library – HVAC Upgrade**

ATTACHMENT C – REVISIONS TO PASSPORT FORMS

This Addendum initiates Round 3 of the procurement.

Please note that numbering of addenda is independent of rounds.

Bid Opening Date Changes:

The Bid Opening scheduled for March 14, 2023 at 2:30pm is rescheduled for March 21, 2023 at 2:30pm.

Questionnaire Changes:

None

Item Grid Changes:

None

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

ADDENDUM TO THE GENERAL CONDITIONS FOR SINGLE CONTRACT PROJECTS

The General Conditions are hereby amended in accordance with the terms and conditions set forth in this Addendum.

I. PROJECT DESCRIPTION

FMS #: **LBC16MPHC**

PROJECT NAME: **Mapleton Branch Library HVAC Replacement**

PROJECT DESCRIPTION: This Project consists of the replacement of all existing air conditioning units including the First and Second Floor reading and circulation areas, the replacement of split air conditioning units serving the Cellar Floor, the addition of new VRF multi-split air conditioners for private spaces, and the installation of a new Building Management System (BMS).

PROJECT LOCATION: 1702 60th Street
BOROUGH: Brooklyn
CITY OF NEW YORK
ZIP CODE: 11204
COMMUNITY BOARD #: 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: ***NO***
If this is a Landmark Quality Structure, Section 01 3591, Historic Treatment Procedures applies to this project.

II. LEED GREEN BUILDING REQUIREMENTS

NOT USED

III. COMMISSIONING REQUIREMENTS

This project includes MEP Commissioning Requirements. The General Commissioning Requirements for MEP Systems are found in Section 01 9113 of the DDC Standard General Conditions. Other specific Commissioning Requirements can be found in the Project Specification Sections.

IV. PROJECT MANAGEMENT

[X] DDC shall publicly bid and enter into all contracts for the Project. DDC shall manage the Project using its own personnel.

[ ] DDC shall publicly bid and enter into all contracts for the Project. A Construction Management firm (the "CM") hired by DDC shall manage the Project. The Contractor is advised that the CM shall serve as the representative of the Commissioner at the site and shall, subject to review by the Commissioner, be responsible for the inspection, management, coordination and administration of the required construction work, as delineated in the article of the Standard Construction Contract entitled "The Resident Engineer".

V. CONTRACTS FOR THE PROJECT

The Project consists of a single contract, the Contract for General Construction Work. The Contractor for General Construction Work is responsible for the performance of all required work for the Project as set forth in the Contract Documents (General Conditions, Drawings and Specifications), including all responsibilities and obligations assigned to separate Contractors for the following subdivisions of the work: Plumbing Work, HVAC Work, and Electrical Work. All responsibilities and obligations in the Contract Documents assigned to separate Contractors for such subdivisions of the work are the responsibility of the Contractor for General Construction Work.

VI. SCHEDULES

The Contractor is advised that Schedules A through E are attached to, and incorporated as part of, this Addendum to the General Conditions. These schedules contain important information that is specific to this Project. The Contractor is advised to carefully review these schedules.

VII. APPLICABILITY OF SECTIONS/SUB-SECTIONS AND AMENDED SUB-SECTIONS

The Contractor is advised that various Sections/Sub-Sections in the General Conditions may not apply to this Project or may apply as amended. Such Sections/Sub-Sections advise the Contractor to "Refer to the Addendum for the applicability of this Section/Sub-Section." Such Sections/Sub-Sections are set forth below. A check mark indicates whether the Section/Sub-Section (1) applies to the Project, (2) does not apply to the Project, or (3) applies to the Project as amended. If no box is checked, the Section/Sub-Section, as set forth in the General Conditions, applies to the Project. Amended Sections/Sub-Sections, if any, are set forth following this list of Sections.

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 22 00		Expanded Work Allowance		X	
01 3216.10		Project Schedules (Method A)		X	
01 3216.20		Project Schedules (Method B)	X		
01 3216.30		Project Schedules (Method C)		X	
	1.7 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		
	3.17(B)	Project Rendering			X		
	3.18 (A-C)	Security Guards / Fire Guards on Site			X		
01 5411	3.1 (A-J)	Temporary Use, Operation and Maintenance of Elevators During Construction for New Buildings Up To and Including 15 Stories			X		
	3.2 (A-M)	Temporary Use, Operation and Maintenance of Elevators During Construction for New Buildings Over 15 Stories			X		
	3.3 (A-E)	Temporary Use, Operation and Maintenance of Elevators During Construction for Existing Buildings	X				
01 7300	3.3 (A-I)	Surveys			X		
	3.4 (A-B)	Borings			X		
	3.12 (A-D)	Sleeves and Hangers	X				
	3.13 (A)	Sleeve and Penetration Drawings			X		
	3.15 (A)	Location of Partitions			X		
01 7419	1.5 (C)	Waste Management Performance Requirements / LEED Certification			X		
01 7900		Demonstration and Owner's Pre-Acceptance Orientation			X		
01 8113.03		Sustainable Design Requirements for LEED v3 Buildings			X		
01 8113.04		Sustainable Design Requirements for LEED v4 Buildings			X		
01 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		

ADDITIONAL SECTIONS/SUB-SECTIONS

The Contractor is advised that the additional Sub-Sections set forth below are included in the General Conditions and apply to the Project.

013100 PROJECT MANAGEMENT AND COORDINATION: add the following:

1.10 COORDINATION WITH OTHER CONTRACTS

A. Coordination with Project FMS ID# LBM15MPRF (Mapleton Library Building Envelope Rehabilitation): A separate Envelope construction project will take place at the time of this HVAC project. The Contractor must coordinate with the Envelope contractor in accordance with Article 12 of the City Standard Construction Contract. All work must be coordinated, including, without limitation, areas of penetration which affect the roof such as dunnage and ductwork must be coordinated.

VIII. SPECIAL EXPERIENCE REQUIREMENTS FOR THE PROJECT

Refer to the PASSPort Questionnaire for Special Experience Requirements.

IX. REVISIONS: SPECIFICATIONS AND CONTRACT DRAWINGS

The Specifications and the Contract Drawings for the Project are revised in accordance with the provisions set forth below.

(1) Owner: Wherever the term “Owner” is used in the Specifications and/or the Contract Drawings, such term shall mean the City of New York.

(2) Other Entities: In the event any entity other than the City of New York is referred to or named as the “Owner” in the Specifications and/or the Contract Drawings, the name of such other entity is deemed deleted and replaced with the “City of New York”.

(3) Architect / Engineer: Wherever the words “Architect”, “Engineer”, “Architect / Engineer” or “Architect and/or Engineer” are used in the Specifications and/or the Contract Drawings, such words are deemed deleted and replaced with the word “Commissioner”.

(4) Products / Manufacturers: Wherever the Specifications and/or the Contract Drawings require the Contractor to provide a particular product (i.e., material and/or equipment) from a designated manufacturer and/or vendor, the term “or approved equal” is deemed inserted, even if only one product and/or manufacturer is specified, except as otherwise provided below.

(a) Proprietary Items: If the Documents section in PASSPort contains a Notice which identifies a particular product from a designated manufacturer as a "Sole Source Product, the Contractor shall be required to provide such specified product. In such case, no substitution or “approved equal” will be permitted.

(5) Special Experience Requirements: Special Experience Requirements for the Project, if any, are set forth in the PASSPort Questionnaire. Special Experience Requirements may apply to Contractors, subcontractors, installers, fabricators, applicators, erectors, specialists, manufacturers and/or suppliers. Refer to DDC General Conditions Section 014000 Article 1.7.C for applicable Special Experience qualification levels. If the Specifications and/or the Contract Drawings contain any Special Experience Requirement that is not set forth in the PASSPort Questionnaire, such Special Experience Requirement is deemed deleted, except as otherwise provided below.

(a) Any Special Experience Requirement that provides that the entity performing the work or supplying the material must have more than three (3) years of experience, is revised to provide that the entity performing the work or supplying the material must have three (3) years of experience as noted in DDC General Conditions Section 014000 Quality Requirements, Article 1.7.B, except as described in paragraph (b) below.

(b) Any Special Experience Requirement that pertains to the abatement of hazardous materials must not be subject to the deletion and/or revision set forth above. Such Special Experience Requirement will remain in full force and effect.

(c) Any Special Experience Requirement that provides that the individual workers performing the work must be licensed, authorized, certified, approved by or acceptable to the manufacturer, is deemed deleted and replaced with the requirement that such individual workers must be properly trained for the specified work.

(6) Alternate Bids: If the agency is requesting the submission of Alternate Bids, a Notice regarding such Alternate Bids is set forth in the Documents section in PASSPort. In the event of any conflict or inconsistency between (1) the Notice regarding Alternate Bids set forth in the Documents section in PASSPort and (2) a provision in the Specifications and/or the Contract Drawings regarding Alternate Bids, the Notice set forth in the Documents section in shall prevail. If the agency is not requesting the submission of Alternate Bids, as indicated by the absence of a Notice in the Documents section in PASSPort, and the Specifications and/or the Contract Drawings contain any provision regarding Alternate Bids, such provision is deemed deleted.

(7) Contractor Retained Engineer: If the Specifications and/or the Contract Drawings require the Contractor to retain an Engineer to provide engineering services for the Project, the following sentence is deemed inserted: “Such Engineer must be a Professional Engineer, licensed in the State of New York.”

(8) LEED Related Provisions: If the Specifications and/or the Contract Drawings require the Contractor to purchase FSC certified wood, rapidly renewable materials, or materials within 500 miles (LEED v3) or 100 miles (LEED v4), such provisions are deemed deleted and replaced with the requirement that if the Contractor has purchased

FSC certified wood, rapidly renewable materials, or materials within 500 miles (LEED v3) or 100 miles (LEED v4), the Contractor shall submit such forms or documentation as may be required by the City in order for the USGBC to certify that the Project qualifies for the related LEED credit(s).

(9) Guarantees: Requirements for Guarantees and Maintenance are set forth in Schedule B, which is included in the Addendum to the General Conditions. In the event of any conflict or inconsistency between (1) a guarantee and/or maintenance requirement set forth in the Specifications and/or the Contract Drawings and (2) a guarantee and/or maintenance requirement set forth in Schedule B, the guarantee and/or maintenance requirement set forth in Schedule B shall prevail.

(10) Warranties: Requirements for Warranties are set forth in Schedule B, which is included in the Addendum to the General Conditions.

(a) The term "manufacturer's warranty" as described in this article encompasses the following terms as indicated in the Specifications: "Manufacturer's Warranty", "Manufacturer's Special Warranty", "Special Warranty", "Special Finish Warranty", "Manufacturer's Special Warranty for a (product, assembly)."

(b) In the event of any conflict or inconsistency between (1) a warranty requirement set forth in the Specifications and/or the Contract Drawings and (2) a warranty requirement set forth in Schedule B, the warranty requirement set forth in Schedule B shall prevail.

(c) In the event a warranty requirement set forth in the Specifications and/or the Contract Drawings is omitted from Schedule B, such omission from Schedule B shall have no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications and/or the Contract Drawings, shall remain in full force and effect.

(d) In the event a warranty requirement for a particular item of material or equipment is omitted from Schedule B, as well as from the Specifications or the Contract Drawings, and the manufacturer of such item actually provides a warranty, the Contractor shall be obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by that manufacturer.

(11) Exculpatory Provisions: In the event the Specifications and/or the Contract Drawings contain any provision whereby the consultant and/or any of its officers, employees or agents, including subconsultants, is absolved of responsibility for any act or omission, such provision is deemed deleted.

(12) Insurance: Provisions regarding insurance coverage the Contractor is required to provide are set forth in Article 22 of the City of New York Standard Construction Contract and Schedule A, which is included in the Addendum to the General Conditions. In the event the Specifications and/or the Contract Drawings contain any provision regarding insurance requirements, such provision is deemed deleted.

(13) Indemnification: Provisions regarding indemnification are set forth in Articles 7, 12, 22 and 57 of the City of New York Standard Construction Contract. In the event the Specifications and/or the Contract Drawings contain any provision regarding indemnification, such provision is deemed deleted.

(14) Dispute Resolution: Provisions regarding dispute resolution are set forth in Article 27 of the City of New York Standard Construction Contract. In the event the Specifications and/or the Contract Drawings contain any provision regarding dispute resolution, such provision is deemed deleted.

(15) Payment to Other Entities: In the event the Specifications and/or the Contract Drawings contain any provision which requires the Contractor to make payments to an entity other than a subcontractor and/or supplier providing services and/or material for the project, such provision is deemed deleted.

(16) General Conditions: In the event of any conflict or inconsistency between (1) the Specifications and/or the Contract Drawings and (2) the General Conditions, the General Conditions shall prevail.

(17) Standard Construction Contract: In the event of any conflict or inconsistency between (1) the Specifications and/or the Contract Drawings and (2) the City of New York Standard Construction Contract, the City of New York Standard Construction Contract shall prevail.

(18) Shall: Wherever the word "shall" is used in the Specifications and/or the Contract Drawings with respect to the Contractor's or Subcontractor's responsibilities or Project Requirements, the term is intended to covey 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	**548 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	**75%**
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. Brooklyn Public Library

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. If the **Work** does not involve construction of a new building or gut renovation work, the **Contractor** may provide an installation floater in lieu of Builders Risk insurance. 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

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 shall promptly repair, replace, restore or rebuild, as the Commissioner may determine, any finished Work in which defects of materials or workmanship may appear or to which damage may occur because of such defects, during the one (1) year period subsequent to the date of Substantial Completion (or use and occupancy in accordance with the Contract), except for the areas of Work set forth below:

- Roofing, Waterproofing, and Joint Sealant Work. For these types of work, the guarantee period shall be (2) two years.

- Trees and/or Plant Material. For trees and/or plant material furnished and installed, the guarantee period shall be (2) two years. During the guarantee period, the Contractor shall provide all maintenance services set forth in the Specifications.

(2) Guaranty Period: The obligation of the Contractor, and its Surety under the Performance Bond, is limited to the period(s) of time specified above.

(3) Other Provisions Deemed Deleted: In the event the Specifications and/or the Contract Drawings contain any provisions regarding guaranty requirements, such provisions are deemed deleted and replaced with the guaranty requirements set forth in this Schedule B.

****

WARRANTY FROM MANUFACTURER

(1) Contractor's Obligation to Provide Warranties: The items of material and/or equipment for which manufacturer warranties are required are listed below. For each item of material and/or equipment listed below, the Contractor shall obtain a written warranty from the manufacturer. Such warranty shall provide that the material or equipment is free from defects for the period set forth below and will be replaced or repaired within such specified period. The Contractor shall deliver all required warranties to the Commissioner.

(2) Required Warranties:

Specification Number	Material or Equipment	Warranty Period
04 42 13	Acoustical Barrier Walls (system)	2 years
04 42 13	Acoustical Barrier Walls (finish)	10 years
05 55 00	Metal Fabrications	5 years
07 92 00	Joint Sealers	5 years
10 21 40	Louvers (finish)	10 years
22 05 23	General-Duty Valves	5 years
22 05 29	Hangers and Supports	5 years
23 05 14	Motor Controls	5 years
23 05 15	Variable Frequency Drives	2 years
23 05 29	Hanger and Supports	5 years
23 33 00	Air Duct Accessories	5 years
23 34 00	HVAC Fans	5 years
23 81 03	Packaged Rooftop Unit (Compressor)	5 years
23 81 03	Packaged Rooftop Unit (Unit Casing Corrosion)	Lifetime
23 81 26	Split-System Air Conditioners (Compressor)	5 years

Specification Number	Material or Equipment	Warranty Period
26 05 19	Low-Voltage Electrical Power Conductors and Cables	5 years
26 05 26	Grounding and Bonding for Electrical Systems	5 years
26 05 29	Hangers and Supports for Electrical Systems	5 years
26 05 33	Raceway and Boxes for Electrical Systems	5 years
26 05 73	Power System Studies	5 years
26 09 43	Network Lighting Controls	5 years
26 24 16	Panelboards	5 years
26 27 26	Wiring Devices	5 years
26 28 13	Fuses	5 years
26 28 19	Enclosed Switches	5 years
26 51 00	Interior Lighting	2 years
26 52 00	Safety Lighting	5 years
28 31 00	Fire Detection and Alarm	2 years

(3) Application: The obligations under the warranty for the periods specified above shall apply only to the manufacturer of the material or equipment, and not to the Contractor or its Surety; provided, however, the Contractor retains responsibility for obtaining all required warranties from the manufacturers and delivering the same to the Commissioner.

(4) Other Provisions: The warranty requirements set forth in this Schedule B are also included in the Specifications.

(a) In the event of any conflict between a warranty requirement set forth in the Specifications and a warranty requirement set forth in Schedule B, the warranty requirement set forth in Schedule B shall take precedence.

(b) In the event a warranty requirement set forth in the Specifications is omitted from Schedule B, such omission from Schedule B shall have no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications, shall remain in full force and effect.

(c) In the event a warranty requirement for a particular item of material or equipment is omitted from both Schedule B and the Specifications, and the manufacturer of such item actually provides a warranty, the Contractor shall be obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by that manufacturer.

(d) In the event a warranty requirement is provided for a particular item of material or equipment, and such requirement specifies a warranty period that is longer than that which is actually provided by any of the specified manufacturers, the Contractor shall be obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by any of the specified manufacturers, unless otherwise directed in writing by the Commissioner.

(e) Unless indicated otherwise Warranties are to take effect on the date of Substantial Completion.

SCHEDULE C

Contract Drawings

(Reference: Section 01 1000, Article 1.5 (A) of the DDC Standard General Conditions)

The Schedule set forth below lists all Contract Drawings for the Project.

T001.00 TITLE SHEET
T002.00 GENERAL NOTES AND BUILDING DEPARTMENT NOTES

A-101.00 CELLAR REFLECTED CEILING DEMOLITION PLAN
A-102.00 1ST FLOOR REFLECTED CEILING DEMOLITION PLAN
A-103.00 2ND FLOOR REFLECTED CEILING DEMOLITION PLAN
A-201.00 CELLAR REFLECTED CEILING PLAN
A-202.00 1ST FLOOR REFLECTED CEILING PLAN
A-203.00 2ND FLOOR REFLECTED CEILING PLAN
A-204.00 ROOF PLAN A-205.00 ROOF DETAILS
A-206.00 ELEVATIONS

S-001.00 STRUCTURAL GENERAL NOTES
S-104.00 STRUCTURAL ROOF FRAMING PLAN

M-001.00 MECHANICAL SYMBOLS, ABBREVIATIONS AND NOTES
M-101.00 MECHANICAL CELLAR DEMOLITION PLAN
M-102.00 MECHANICAL 1ST FLOOR DEMOLITION PLAN
M-103.00 MECHANICAL 2ND FLOOR DEMOLITION PLAN
M-104.00 MECHANICAL ROOF DEMOLITION PLAN
M-201.00 MECHANICAL CELLAR PLAN
M-202.00 MECHANICAL 1ST FLOOR PLAN
M-203.00 MECHANICAL 2ND FLOOR PLAN
M-204.00 MECHANICAL ROOF PLAN
M-301.00 MECHANICAL SECTIONS
M-401.00 MECHANICAL AIR FLOW RISER DIAGRAM
M-402.00 MECHANICAL REFRIGERANT PIPING SCHEMATIC
M-501.00 MECHANICAL SCHEDULES SHEET 1
M-502.00 MECHANICAL SCHEDULES SHEET 2
M-503.00 MECHANICAL SCHEDULES SHEET 3
M-601.00 MECHANICAL DETAILS SHEET 1
M-602.00 MECHANICAL DETAILS SHEET 2
M-603.00 MECHANICAL DETAILS SHEET 3
M-604.00 MECHANICAL DETAILS SHEET 4
M-605.00 MECHANICAL DETAILS SHEET 5
M-701.00 CONTROL DIAGRAMS SHEET 1
M-702.00 CONTROL DIAGRAMS SHEET 2
M-703.00 CONTROL DIAGRAMS SHEET 3
M-704.00 CONTROL DIAGRAMS SHEET 4

E-001.00 ELECTRICAL GENERAL AND DEMOLITION NOTES, SYMBOLS AND ABBREVIATIONS
E-101.00 ELECTRICAL CELLAR DEMOLITION PLAN
E-102.00 ELECTRICAL 1ST FLOOR DEMOLITION PLAN
E-103.00 ELECTRICAL 2ND FLOOR DEMOLITION PLAN
E-104.00 ELECTRICAL ROOF DEMOLITION PLAN
E-201.00 ELECTRICAL CELLAR POWER PLAN
E-202.00 ELECTRICAL 1ST FLOOR POWER PLAN
E-203.00 ELECTRICAL 2ND FLOOR POWER PLAN
E-204.00 ELECTRICAL ROOF POWER AND LIGHTING PLAN

E-301.00 ELECTRICAL CELLAR LIGHTING PLAN
E-302.00 ELECTRICAL 1ST FLOOR LIGHTING PLAN
E-303.00 ELECTRICAL 2ND FLOOR LIGHTING PLAN
E-401.00 ELECTRICAL PANELBOARD SCHEDULES & DETAILS
E-501.00 ELECTRICAL RISER DIAGRAMS
E-601.00 LIGHTING CONTROL WIRING DIAGRAMS

FA-001.00 FIRE ALARM NOTES, SYMBOLS, AND ABBREVIATIONS
FA-101.00 FIRE ALARM CELLAR DEMOLITION PLAN
FA-102.00 FIRE ALARM 1ST FLOOR DEMOLITION PLAN
FA-103.00 FIRE ALARM 2ND FLOOR DEMOLITION PLAN
FA-104.00 FIRE ALARM ROOF DEMOLITION PLAN
FA-201.00 FIRE ALARM CELLAR PLAN
FA-202.00 FIRE ALARM 1ST FLOOR PLAN
FA-203.00 FIRE ALARM 2ND FLOOR PLAN
FA-204.00 FIRE ALARM ROOF PLAN
FA-301.00 FIRE ALARM RISER DIAGRAM
FA-401.00 FIRE ALARM TYPICAL DETAILS

P-001.00 PLUMBING SYMBOLS, ABBREVIATIONS, DETAILS AND NOTES
P-101.00 PLUMBING ROOF DEMOLITION PLAN
P-200.00 PLUMBING CELLAR PART PLANS
P-201.00 PLUMBING ROOF PLAN

SCHEDULE D

Electrical Motor Control Equipment

(Reference: 01 3506, Article 3.8 of the DDC Standard General Conditions)

Requirements for electrical motor equipment may be included in one or more sections of the Specifications for the Contract for the Project. Schedule D set forth below delineates specific information for electrical motor control equipment. In the event of any conflict between the Specifications and this Schedule D, Schedule D shall take precedence; provided, however, in the event of an omission from Schedule D (i.e., Schedule D omits either a reference to or information concerning electrical motor equipment which is set forth in the Specifications), such omission from Schedule D shall have no effect and the Contractor's obligation with respect to the electrical motor control equipment, as set forth in the Specifications, shall remain in full force and effect.

DB Disconnect Circuit Breaker (Switch)
TS Thermal Switch
MS Magnetic Starter
CMS Comb. Mag. Starter
P Pilot Light
F Firestat
T Thermostat
AL Alternator
BG Break Glass Station
HOA Hand-Off Auto.
PB Push Button Station
RO Remote "off"

Equip. Ident.	Location	# of Units	HP or KW	Volts and Phase	Control Type: See legend above	Remarks:
RTU-3	ROOF	1	5 HP	208/3	HOA	VFD
RTU-4	ROOF	1	5 HP	208/3	HOA	VFD
ERV-1	CELLAR	1	1	208/1	HOA	
AC-1	CELLAR	1	1.5 HP	208/3	HOA	VFD
HRIU-1,23	CELLAR	3	330 W; 120 W; 60 W	208/1	T	
HRIU-4	1ST FLOOR	1	60 W	208/1	T	
HRIU-5,6	2ND FLOOR	2	60W	208/1	T	
TE-1	CELLAR	1	172 W	120/1	HOA	
TE-2;3	ROOF	2	1/10 HP	120/1	HOA	
TE-4	1ST FLOOR	1	172 W	120/1	HOA	
RF-1	CELLAR	1	1 HP	120/1	HOA	
RF-4;3	PETHOUSE	2	3 HP	208/3	HOA	VFD
SF-1	2ND FLOOR	1	0.5 HP	120/1	HOA	

SCHEDULE E

Separation of Trades

NOT USED FOR SINGLE CONTRACTS

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CONTRACT # 1

GENERAL CONSTRUCTION WORK

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SECTION 02 41 13 - SELECTIVE SITE 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. Work Included: Provide products in accordance with the Contract Documents. The Work of this Section will include but not be limited to the following:
   1. The work must generally include removal of portions of existing building structures and assemblies indicated on drawings and as required to accommodate new construction including parts of walls, fixtures, equipment, and interior finishes.
   2. The extent of selective demolition work required is shown by notes and graphic information on the drawings, and may be summarized, but not by way of limitation, as the removal of interior work as indicated, the removal of existing construction (to the extent indicated) from the building and removal work at existing adjacent construction, as necessary to receive or provide for new construction and related items to be reinstalled and/or retained.
   3. Primary repair and restoration of existing and installation of new construction after completion of the selective removal work. The work of this section is limited to that necessary to enable subsequent new construction work to proceed in a phased schedule as described in the contract documents.
   4. Removal of portions of existing assemblies indicated on drawings and as required to accommodate new construction; including partitions, finishes, access doors, ceiling finishes, fixtures, built-in casework, equipment and assemblies, as indicated.
   5. Removal of assemblies and adjacent partitions to accommodate new construction and new openings.
   6. Removal and protection of existing items to remain or to be relocated.
   7. Removal of debris, rubbish, materials and equipment resulting from removals, abandoned items, and items serving no useful purpose in new construction, including items such as piping, fixtures, conduit, wiring, ducts, etc. except for material intended for reuse or to be retained.
   8. Provisions for storage and protection of salvaged materials and other materials in good condition intended for reuse or to be retained.
   9. Patching of existing surfaces damaged as a result of this work, for refinishing of existing surfaces prior to installation of new work.
   10. Cutting of non-structural concrete and masonry for piping ducts, and conduit is included in the respective mechanical and electrical sections in Divisions 23 and 26.

B. Related Sections:
   1. Refer to DDC General Conditions for coordination, cutting and patching standards, submittals, temporary facilities, materials, closeout and other related requirements specified.
   2. Division 22 - Plumbing.
   3. Division 23 - Mechanical.
   4. Division 26 - Electrical.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”

B. Schedule indicating proposed sequence of operations for selective demolition work to the Commissioner for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.
   1. Include written proposals, supplemented by diagrams and shop drawings as necessary, indicating proposed procedures for the protection of portions of the existing building indicated to remain.

C. Data Sheets: Submit manufacturers' data sheets of all materials to be used for protection.

D. Photographs of existing conditions of structures, surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. Submit copies to the Commissioner prior to start of work.

E. Contractor must obtain permits for the demolition of existing premises prior to the start of any demolition.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Code: Perform the work in accordance with the applicable provisions of the New York City Building Code including, but not limited to, “Safety in Building Operations” and “Safety of Public and Property During Construction Operations and Demolition Operations”.

C. Structural Work: Do not remove or cut-and-patch structural work in a manner resulting in a reduction of load carrying capacity or load/deflection ratio, unless specifically indicated, or adequate temporary support is provided.
   1. The Contractor must employ, at no additional cost to the City of New York, a Professional Engineer licensed in the State of New York, to assist in determining correct methods and materials to be used during the Work of this Section.
   2. Where structural elements of the building are removed, submit certification by a Professional Engineer licensed in the State of New York, that the means and methods used are appropriate and do not endanger remaining structure.

D. Operational and Safety Limitations: Do not remove or cut-and-patch operational elements and safety-related components in a manner intended or resulting in decreased operational life or decreased safety, unless specifically indicated.

E. Workman's Qualifications: Assign the work of moving, removal, cutting, and patching to trades qualified to perform the work in a manner to cause least damage to each type of work and provide means of returning surfaces to appearance of new work.

F. Contractor's Responsibility: Be solely responsible for construction means, methods, techniques, sequences, procedures, and safety precautions, including work necessary to support existing construction. Correct, at no additional cost to the City of New York, damage caused by movement or settlement due to inadequate or improper supports.

1.5 JOB CONDITIONS

A. Existing Information: Data on existing conditions are not intended as representations or warranties of accuracy or continuity of as-built conditions. It is expressly understood that the Commissioner will not be responsible for deviations from conditions indicated. Data made available are derived from existing documents or field survey and is made available for convenience of the Contractor.

B. Condition of Structures: The City of New York assumes no responsibility for actual condition of items or structures to be demolished.
   1. Conditions existing at time of inspection for bidding purposes will be maintained by Mapleton Library in so far as practicable. However, variations within structure may occur by Mapleton Branch Library's removal and salvage operations prior to start of this demolition work.

C. Partial Demolition and Removal: Items to be removed, of salvageable value to the Contractor, may be removed from structure as work progresses. The Commissioner will designate items that are to be removed by the Contractor and items that will be reinstalled or turned over to Mapleton Branch Library. All other demolition items must be removed by the Contractor and removed from the premises.
   1. Storage or sale of removed items on site will not be permitted.

D. Protections: Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.
   1. Provide shoring, bracing, or support to prevent movement, settlement or collapse of structures to be demolished and adjacent facilities to remain.
   2. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
   3. Carefully remove items indicated to be reinstalled using methods that will not cause damage or prevent reinstallation.
   4. Provide at least one general type fire extinguisher in each area where removal work is taking place. Locate extinguisher where easily accessible and ensure that workmen are familiar with their use.
   5. Refer to the Drawings for existing connection and materials requiring special care be exercised to protect and maintain them in their original condition.
   6. Remove and dispose of temporary protections at completion of work or when no longer necessary.

E. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to The City of New York. All remedial work to be done by the Contractor will first be approved by the Commissioner.

F. Traffic: Conduct selective demolition operations and removal of debris to ensure minimum interference with streets, walks, and other adjacent occupied or used facilities.
   1. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the Commissioner. Provide alternate routes around closed or obstructed traffic ways if required by the Commissioner.

G. Explosives: Do not bring explosives to site or use explosives.

H. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.

1. Verify that utilities not required to remain in service have been shut off. Disconnecting and capping indicated utilities where noted before starting demolition is part of this Work. Confirm with local utilities the locations of existing utilities so that adequate protection of services is provided.
2. Should uncharted, or incorrectly charted piping or other utilities be encountered during alteration work, consult the Commissioner immediately for directions.
3. Demolish and completely remove existing utilities indicated to be removed. Coordinate shut-off of services if lines are active.

I. Flame Cutting: Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire extinguisher during flame-cutting operations.

J. Protect and support conduits, drains, pipes and wires to remain which are subject to damage by construction activities.

K. Environmental Controls: Use temporary enclosures, water sprinkling, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.

L. Do not use water when it may create hazardous or objectionable conditions such as damage to finishes, flooding, and pollution.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Where indicated on the Drawings or otherwise indicated furnish all required lumber, plywood and fasteners for use as protection materials.

B. Other materials indicated on the Drawings or otherwise required for use as protection include the following:
1. Masonite: 1/4" thick minimum.
2. Polyethylene sheeting, 6 mil minimum, reinforced.

2.2 REPAIR MATERIALS

A. Use repair materials identical to existing materials.
1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
2. Use materials whose installed performance equals or surpasses that of existing materials.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. General: Prior to commencement of selective demolition operations, verify that existing utilities have been located, identified, disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Commissioner.

E. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition. Design for shoring and bracing must be prepared by a Professional Engineer licensed in the State of New York.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.3 UTILITY SERVICES

A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by the Commissioner, including building management. Provide temporary services during interruptions to existing utilities, as acceptable to the Commissioner.
      a. Provide not less than 72 hours' notice to the Commissioner if shutdown of service is required during changeover.

B. Utility Requirements: Refer to Division 22, 23 and 26 Sections for shutting off, disconnecting, removing, and sealing or capping utility services. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.4 PREPARATION

A. General: Provide interior shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished or disassembled and adjacent facilities to remain.

B. Cease operations and notify the Commissioner immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

C. Cover and protect finishes, equipment, and fixtures from spoilage or damage when demolition or disassembly work is performed in areas where such items have not been removed.

D. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.
   1. Each respective trade to provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours' advance notice to the Commissioner if shutdown of service is necessary during changeover.

3.5 DEMOLITION

A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
   1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
   2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.
   3. Provide services for effective air and water pollution controls as required by NYCDEP.
   4. For interior slabs, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.

B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to the Commissioner in written, accurate detail. Pending receipt of directive from the Commissioner, rearrange the selective demolition schedule as necessary to continue overall job progress without undue delay.

3.6 SALVAGED MATERIALS

A. Salvaged Items: Where indicated on Drawings as "Salvage" or "to be salvaged", carefully remove indicated items, clean, store, and turn over to the Commissioner and obtain receipt.
   1. Where Salvage is indicated clean store and protect as directed. Turn over or reinstall as indicated.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off site.
   1. If hazardous materials are encountered during demolition operations, comply with NYCDEP, EPA regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
   2. Burning of removed materials is not permitted on project site.
   3. All lead-contaminated debris and wastes generated during the demolition must be disposed of as hazardous waste, pursuant to the State of New York and federal environmental regulations.

3.8 CLEANUP, PATCHING AND REPAIR

A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.
   1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

2. Clean adjacent areas, of all dust, dirt, and debris caused by demolition, cutting, and patching operations. Daily and final clean up must be satisfactory to the Commissioner.
3. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.
4. Restore the integrity of rated construction where compromised by demolition.
5. Patch and repair floor and wall surfaces where demolished walls or partitions extend one finished area into another. Provide a flush and even surface of uniform color. Closely match texture and finish of existing adjacent surface with durable seams that are as invisible as possible, complying with specified tolerances.

END OF SECTION 02 41 13

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SECTION 028013 – GENERAL CONTRACTOR WORK
NOVEMBER 2017 VERSION

ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT

1.01 SCOPE FOR ASBESTOS ABATEMENT WORK

A. The "General Conditions" apply to the work of this Section.

B. The asbestos abatement contractor shall remove asbestos containing materials as needed to perform the other work of this Contract when discovered during 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.

If 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. The procedure utilized for asbestos follows the N1OSH 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 always have access to all areas of the asbestos removal project and shall continuously inspect and monitor the performance of the asbestos abatement contractor to verify that said performance complies with this Specification. The Third-Party Air Monitor shall be on site throughout the entire abatement operation.

D. The NYCDDC will be responsible for costs incurred with the Third-Party Air Monitoring Firm and laboratory work. Any subsequent additional testing required due to limits exceeded during initial testing shall be paid for by the asbestos abatement contractor.

1.07 PAYMENT REQUEST DOCUMENTATION

B. The following information shall be included for each payment request:

1. Description of work performed.

2. Linear footage and pipe sizes involved.

3. Square footage for boiler & breaching insulation removed.

4. Square footage of non pipe and boiler areas removed, patched, enclosed, sealed, or painted.

5. Square footage of encapsulation, sealing, patching, and painting involved.

6. Total cost associated with compliance with the assigned task.

7. Architectural, Electrical, HVAC, Plumbing, etc. work incidental to the Asbestos Abatement Work.

8. A certified copy (in form 4312-39) to the Comptroller or Financial Officer of the New York City to the effect that the financial statement is true.

9. A signed copy (in form 6506q-6) of certificate of compliance with non-discriminatory provisions of the Contract.

10. Attach a copy of valid workmen compensation insurance.

11. Valid asbestos insurance per occurrence.

12. General liability insurance when required.

C. Each payment request shall include a grand total for all work completed that billing period, the landfill waste manifests and a copy of waste transporter permit. The Department of Design and Construction will inspect the work performed, review the cost and approve or disapprove requests for payment.

D. EXPOSURE LOG: With this final payment, the asbestos abatement contractor shall submit a listing of the names and social security numbers of all employees actively engaged in the abatement work of this Contract. This list shall include a summary showing each part of the abatement work in which the employee was engaged and the dates thereof.

1.08 QUANTITY CALCULATIONS

In order to determine the square footage involved for the various pipe sizes of pipe insulation that might be encountered, the following table is to be used.

PIPE INSULATION SIZE O.D.	PIPE SIZE O.D.	SQUARE FOOTAGE PER LINEAR FOOT
2-1/2"	1/2"	0.65
2-3/4"	3/4"	0.72
3"	1"	0.79
3-1/4"	1-1/4"	0.85
3-1/2"	1-1/2"	0.92
4"	2"	1.05
4-1/2"	2-1/2"	1.18
5”	3”	1.31
6"	3-1/4"	1.57
7"	3-1/2"	1.83
8"	4"	2.09
9”	5"	2.36
10"	6"	2.62
12"	8"	3.14
14"	10"	3.67
16"	12"	4.19
18"	l4”	4.71

1.09 METHOD OF PAYMENT

Payment shall be made in accordance with Items A through R below. Payment shall be calculated based on the actual quantity of the item performed by the asbestos abatement contractor, times the unit price specified below. Credits may apply to certain times, as specified below.

A. **REMOVAL, DISPOSAL AND REPLACEMENT OF ASBESTOS CONTAINING PIPE INSULATION:** Actual linear footage, multiplied by the square footage factor listed for the respective pipe size in Section 1.08, multiplied by the unit price in Section 1.04.

EXAMPLE: 100 lin.ft. of 1/2" pipe and 100 lin.ft. of 6" pipe, including elbows, tees. Flanges, etc.

100 X 0.65 = 65 sq.ft. 65 x unit price = Payment

100 X 2.62 = 262 sq.ft. 262 x unit price = Payment

B. **REMOVAL, DISPOSAL AND REPLACEMENT OF BOILER INSULATION:** (all types including Silicate Block and including the removal/replacement of metal jacketing) Payment shall be made at 1.5 times the unit price per square foot.

EXAMPLE: Item B. removal and replacement of 1000 S.F. of boiler insulation (incl. Silicate block)

1000 S.F. X (1.5) X the Unit Price = Payment

C. **REMOVAL, DISPOSAL AND REPLACEMENT OF TANK INSULATION:** (all types including removal/replacement of metal jacketing) Payment shall be made at 1.5 times the unit price per square foot.

D. **REMOVAL, DISPOSAL AND REPLACEMENT OF BOILER UPTAKE, & BREACHING INSULATION:** (all types including stiffening angles and wire lath) Payment shall be made at 2.0 times the unit price per square foot.

E. **REMOVAL, DISPOSAL AND REPLACEMENT OF DUCT INSULATION:** Payment shall be made at 1.0 times the unit price per square foot.

F. **REMOVAL, DISPOSAL AND REPLACEMENT OF SOFT ASBESTOS CONTAINING MATERIAL:** (Including sprayed-on fire proofing and sound proofing) Payment shall be made at 1.0 times the unit price per square foot of surface area. Area of irregular surfaces must be calculated and confirmed with DDC representative.

G. **ACOUSTIC PLASTER REPAIR AND/OR ENCAPSULATION:** Payment shall be made at 0.5 times the unit price per square foot.

H. **PATCHING OR REPAIR** of items listed in A through F will be paid at 0.33 times the unit price per square foot.

I. **REMOVAL, DISPOSAL AND REPLACEMENT OF WATERPROOFING ASBESTOS CONTAINING MATERIAL: (**including friable and non-friable waterproofing material from interior and exterior walls, floors, foundations, penetrations, louvers, vents and openings other than windows, doors and skylights) **Payment** shall be made at 0.5 times the unit price per square foot.

J. **REMOVAL, DISPOSAL AND REPLACEMENT OF ASBESTOS CONTAINING ELECTRICAL WIRING INSULATION:** (including friable and non-friable wiring insulation) Payment shall be made at 0.33 times the unit price per square foot.

K. **PAINTING:** Payment shall be made at 0.05 times the unit price per square foot.

L. **REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING PLASTER:** from ceilings and walls, including any wire lath and disposal as asbestos containing waste. Payment shall be made at 0.80 times the unit price per square foot.

M. **REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING FLOOR TILES, CEILING TILES, TRANSITE PANELS:** (including any adhesive, glue, mastic and/or underlayment) and disposal as asbestos containing waste. Payment shall be made at 0.40 times the unit price per square foot. If multiple

layers are discovered, each additional layer shall be paid at 0.20 times the unit price per square foot.

N. **ADDITIONAL CLEAN UP/HOUSEKEEPING OF WORK AREA:** (excluding pre-cleaning of work area required by regulations) HEPA vacuuming and wet cleaning of asbestos contaminated surface. Payment shall be made at 0.20 times the unit price per square foot. When GLOVE BAG is employed to remove ACM, cost of HEPA vacuuming and wet cleaning of floor area up to 3 feet on each side of glove-bag shall be included in unit price and no extra payment will be made.

O. **REMOVAL, DISPOSAL OF ASBESTOS-CONTAINING ROOFING MATERIAL:** including mastic, flashing and sealant compound and provide temporary asbestos-free roof covering consisting of one layer of rolled roofing paper sealed with asphaltic roofing compound. Payment shall be made at 0.8 times the unit price per square foot. Credit at a rate of 0.33 times the unit price will be taken for each square foot of temporary roof covering which the asbestos abatement contractor is directed not to install.

P. **PICK-UP AND DISPOSAL OF GROSS DEBRIS:** (excluding any waste generated from abatement under Item A-R) at a rate of $150 per cubic yard for asbestos contaminated waste and $75 per cubic yard for non-asbestos contaminated waste. This cost includes all labor and material cost associated with work.

Q. **REMOVAL OF ASBESTOS-CONTAINING BRICK, BLOCK, MORTAR, CEMENT OR CONCRETE:** along with all surfacing materials including wire lath and/or other supporting structures and disposal as ACM waste. Payment shall be made at a rate of $25.00 per cubic foot of material removed.

R. **REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING WINDOW/DOOR CAULKING:** including friable and non-friable caulking, weather-stripping, glazing, sealants or other waterproofing materials applied to windows, doors, skylights, etc. Payment shall be made at the rate of $400.00 per opening regardless of size or configuration. This cost includes labor, consumable materials, set-up/breakdown, removal and disposal, as required.

Note 1: CREDIT: For items listed in A through F, a credit at a rate of 0.33 times the unit price, times the respective multiplier (for each item) will be taken for each square foot of insulation which the asbestos abatement contractor is not directed to reapply.

Note 2: MINIMUM PAYMENT: The minimum payment per call at any individual job sites or various job sites during the same day will be eight hundred dollars ($800.00).

Note 3: All payments shall be made as described in paragraph 1.09 herein**.**

Note 4: WORKING HIGHER THAN 12 FEET ABOVE FLOOR LEVEL OR WORK REQUIRING COMPLEX SCAFFOLDING OR CONSTRUCTION WORK

PLATFORMS: Provisions are made in this Contract to compensate the asbestos abatement contractor for work performed in locations that are difficult to access due to work at elevations that are significantly higher than the normal work level. The unit price for these items will be paid at 1.20 times the unit price described in Paragraphs 1.09, A through R for those portions of the work that are more than twelve (12) feet above the grade for that would be judged as the normal working level.

1.10 GUARANTEE

A. Work performed in compliance with each task shall be guaranteed for a period of one year from the date the completed work is accepted by the Department of Design and Construction.

B. The Commissioner of The Department of Design and Construction will notify the asbestos abatement contractor in writing regarding defects in work under the guarantee.

1.11 OCCUPANCY OF SITE NOT EXCLUSIVE

Attention is specifically drawn to the fact that contractors, performing the work of other Contracts, may be brought upon any of the work sites of this Contract. Therefore, the asbestos abatement contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other contractors who may be brought upon any site of the work of this Contract. This paragraph applies to those areas outside the regulated Work Area as defined by Title 15, Chapter I of RCNY.

1.12 SUBMITTALS

A. Pre-Construction Submittals:

1. Attend a pre-construction meeting scheduled by the City of New York Department of Design and Construction. This meeting shall also be attended by a designated representative of the City of New York third party air monitoring firm, facility manager and the Construction Project Manager. At this meeting, the asbestos abatement contractor shall present three copies of the following items:
   a. asbestos abatement contractor’s scope of work, work plan and schedule.

   b. Asbestos project notifications, approved variances and plans to Government Agencies.

   c. Copies of Permits, clearance and licenses if required.

   d. Schedules: the asbestos abatement contractor shall provide to the Construction Project Manager a copy of the following schedules for

approval. Once approved, schedules shall be maintained and updated as received. asbestos abatement contractor shall post a copy of all schedules at the site:

(1) A construction schedule stating critical dates of the project including, but not limited to, mobilization, Work Area preparation, demolition, gross removal, fine cleaning, encapsulation, inspections, clearance monitoring, and phase of refinishing and final inspections. The schedule shall be updated biweekly, at a minimum.

(2) A schedule of staffing stating number of workers per shift per activity, name and number of supervisor(s) per shift, shifts per day, and total days to be worked.

(3) Submit all changes in schedule or staffing to the Construction Project Manager prior to implementation.

e. Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number to nearest hospital) and procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.

f. Safety Data Sheets (SDS) for encapsulants, sealants, firestopping foam, cleaners/disinfectants, spray adhesive and any and all potentially hazardous materials that may be employed on the project. No work involving the 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 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 always be kept on site. 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 03 10 00 - CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Forms wherever necessary to confine concrete and shape it to required dimensions.

B. Related Sections:
   1. Section 03 20 00 - Concrete Reinforcing
   2. Section 03 30 00 - Cast-in-Place Concrete

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards will be deemed mandatory and applicable to the Work.

B. American Concrete Institute (ACI) standards, latest editions.
   1. ACI 301 Specifications for Structural Concrete for Buildings.
   2. ACI 347 Guide to Formwork for Concrete.

1.4 DESIGN REQUIREMENTS

A. The design and engineering of the formwork, as well as its construction, is the responsibility of the Contractor.

B. Design formwork in accordance with ACI 347 and Section BC 1906 of the 2014 NYC Building Code.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”

B. Product Data
   1. Submit manufacturers' information for the following:
      a. Ties, each type and where to be used
      b. Form-release agent. Form-release agent to be submitted for review only.

C. Shop Drawings
   1. Prepare and submit formwork shop drawings and calculations prepared and sealed by a Professional Engineer licensed in the State of New York for review when required by Section BC 1906.3 of the 2014 NYC Building Code.

D. Quality Control Submittals
   1. Contractor Qualifications
   2. Provide proof of Formwork Installer qualifications specified under “Quality Assurance”.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Qualifications:
   1. Company specializing in performing the Work of this Section must have three years minimum experience.
   2. Person responsible for inspection of formwork must be a qualified person as defined in Section BC 3302.1 of the 2014 NYC Building Code.

C. Regulatory Requirements:
   1. Building Code: Work of this Section must conform to all requirements of the NYC Building Code. Where more severe requirements than those contained in the Building Code are given in this Section and ACI 347, the requirements of this Section and ACI 347 will govern.
   2. Industrial Code Rule #23 of the Department of Labor, paragraphs 23.10.1 to 23-10.5 inclusive.
   3. ACI 347.

1.7 DELIVERY, STORAGE AND HANDLING

A. Protection:
   1. Protect formwork materials before, during and after installation.
   2. Protect installed work and materials of other trades.

B. Replacement:
   1. Repair or replace damaged formwork as approved by the City of New York.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Rough Formwork:
   1. Commercial Douglas Fir, DFPA: 5/8" thick minimum or modular metal units.

B. Release Agent:
   1. VOC compliant material.

C. Form Ties:
   1. Form ties for exposed concrete must be adjustable.
   2. Form ties for exposed concrete and concrete to receive membranes must be a break-off type and leave no metal closer than $1^1/_2$" to the surface.
   3. Form ties for concrete stated in 2 above must be free of devices which leave holes or depressions larger than 7/8" back of exposed surface.
   4. Wire ties not permitted.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION OF FORMWORK SURFACES

A. Clean all surfaces of forms and embedded items of any accumulated mortar or grout from previous concreting and other foreign material before concrete is placed in them. Repair or replace any formwork as required.

B. Before placing either reinforcing steel or concrete, cover the surfaces of the rough formwork with an approved form release agent that will effectively prevent absorption of moisture, prevent bond with the concrete, and which will not stain the concrete surfaces. Material must be carefully applied at the amount recommended by the release agent manufacturer to obtain the desired finish. Do not apply oil or release agents on formwork for concrete to receive coatings such as membrane waterproofing, plaster, or additional concrete (such as at construction joints). Follow manufacturer's recommendations for alternatives.

3.3 CONSTRUCTION AND DETAILS

A. Adequately support and substantially brace formwork to hold lines and shape.

B. Formwork must be tight jointed to prevent leakage of mortar from the concrete.

C. Place chamfer strips in the corners of forms to produce beveled edges (chamfers) on permanently exposed surfaces (such as exposed columns). Do not provide beveled edge for interior corners of such surfaces and where members are flush with partitions or walls, unless required by Drawings or specified elsewhere.

D. Set slab-forms with camber of 1/4" per 10 feet of span to maintain tolerances. For two-way slabs, the lesser span dimension will govern.

E. Provide positive means of adjustment (wedges or jacks) for shores and struts to take up all settlement during concrete placing operations. Fasten wedges used for final adjustment of forms prior to concrete placement in position after final check. Securely brace forms against lateral deflection.

F. Provide mud sills where shores rest on compressible materials.

G. Provide temporary openings to permit cleaning and inspection. Provide ample time for proper inspection before placement of concrete.

H. Provide "Rough Form Finish" for surfaces not exposed to view. Use plywood or metal forms coated with a release agent.

I. Form holes for pipes, pipe sleeves, electric outlets, electric conduits, etc. as required. Construct woodforms for wall forms to facilitate loosening, if necessary, to counteract swelling of forms.

J. Provide runways for moving equipment with struts or legs, which must be supported directly on the formwork or structural member without resting on the reinforcing steel.

K. Provide for rebates, reglets, grooves keys, pockets, ground nailers, projections and other built-in work prior to placement of concrete. Install reglets as per manufacturer's instructions.

L. Install dovetail slots, concrete inserts, and other metal fabrications. .

M. At construction joints, contact surface of the form sheathing for flush surfaces exposed to view must overlap the hardened concrete in the previous placement by not more than 1". The forms must be held against the hardened concrete to prevent offsets or loss of mortar at the construction joint and to maintain a true surface.

N. Form accessories to be partially or wholly embedded in the concrete, such as ties and hangers, must be of a commercially manufactured type. Use of non-fabricated wire is not permitted. Construct form ties so that the ends or end fasteners can be removed without causing appreciable spalling at the faces of the concrete. After the ends or end fasteners of the form ties have been removed, terminate the embedded portion of the ties not less than 2 diameters or twice the minimum dimension of the tie from the formed faces of concrete to be permanently exposed to view, except that in no case will this distance be less than 3/4". When the formed face of the concrete is not to be permanently exposed to view, form ties may be cut off flush with the formed surfaces.

O. Carefully check all forms before placement of concrete. Give special care to suspended first floor slabs resting on compressible material to prevent settlement.

P. Notify the Commissioner if openings are required but not shown on the Drawings, who will issue instructions accordingly.

3.4 REMOVAL OF FORMS AND SHORING

A. Remove forms in such a manner as to assure the complete safety of the structure as required by Section BC 1906.5 of the 2014 NYC Building Code.

3.5 TOLERANCES

A. Construct formwork so that concrete surfaces will conform to the tolerance limits listed in ACI 117.

B. Establish and maintain in an undisturbed condition and until final completion and acceptance of the project sufficient control points and benchmarks to be used for reference purposes to check tolerances.

3.6 INSPECTION

A. Under the requirements of Section 1704.4 of the Building Code of New York City, the Commissioner will designate an Engineer for Special Inspection to inspect formwork, including shores, braces, and other supports, to verify the sizes of concrete members being formed. The Commissioner will make inspections prior to placement of steel, after placement, and during placement of concrete.

B. Under the requirements of Section 1704 of the New York City Building Code, the Contractor's superintendent must inspect the forms for conformance with form design drawings when such drawings are required by Chapter 19 of the New York City Building Code. Make inspections prior to placement of steel and subsequently periodically after placement and during placement of concrete to detect incipient problems.

C. During and after concrete placement, check elevations and vertical alignment of formwork systems using tell-tale devices.

D. Keep a record of all inspections, the name of the persons making them, and the name of the foreman in charge of formwork at the site. Submit to the Commissioner a copy of the inspection records prior to each concrete placement.

END OF SECTION 03 10 00

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SECTION 03 20 00 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Reinforcement and associated items required for cast-in-place.

B. Related Sections:
   1. Section 03 10 00 - Concrete Forming and Accessories
   2. Section 03 30 00 - Cast-in-Place Concrete

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards will be deemed mandatory and applicable to the Work.
   1. American Society of Testing and Materials (ASTM) standards, latest editions.
      a. A82 Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
      b. A184 Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
      c. A185 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
      d. A496 Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
      e. A497 Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
      f. A615 Standard Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
      g. A706 Standard Specifications for Low-Alloy Steel Deformed and Plain Bars for Concrete reinforcement
      h. A775 Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
      i. A884 Standard Specifications for Epoxy-coated Wires and Welded Wire Reinforcement.
   2. American Concrete Institute (ACI) standards, latest editions.
      a. ACI 301 "Specification for Structural Concrete for Buildings."
      b. ACI 315 "Details and Detailing of Concrete Reinforcement."
      c. ACI 318-02 "Building Code Requirements for Reinforced Concrete (With modifications per Section BC 1908 of the 2014 NYC Building Code).

B. "Placing Reinforcing Bars - CRSI-WCRSI Recommended Practices", latest edition. Concrete Reinforcing Steel Institute.

C. "Structural Welding Code - Reinforcing Steel" D1.4 - American Welding Society (AWS).

D. "Near-White Blast Cleaning" SSPC-SP10 - Steel Structures Painting Council (SSPC).

1.4 DESIGN REQUIREMENTS

A. In lieu of placing reinforcement bars, the Contractor has the option of using welded wire reinforcement (WWR).
   1. WWR must be demonstrated to the satisfaction of the Commissioner that they are of equivalent strength to the reinforcing bars that are being substituted.
   2. As per ACI 318, yield strength greater than 60,000 psi may be used (for WWR) provided the yield strength is measured at a strain of 0.0035 in./in. in accordance with ACI code requirements.

B. Provide epoxy-coated reinforcement for all concrete work exposed to the elements, such as exterior framed slabs, exposed faces of site/retaining walls/curbs, parapet walls, etc.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”

B. Product Data: Submit manufacturer’s information for the following:
   1. Steel welded wire fabric
   2. Steel welded wire reinforcement.
   3. Supports
   4. Mechanical connectors

C. Shop Drawings:
   1. Immediately after award of Contract, prepare shop drawings showing all fabrication dimensions and locations for placing of the reinforcing steel and accessories. Shop Drawings are to be prepared by a rebar detailer.
   2. Follow detailing recommendations of ACI 315.
   3. Submit drawings gradually and not all at the same time so that sufficient time is allowed for checking and approval. Improperly prepared and incomplete shop drawings will be disapproved without review.
   4. Shop drawings will be checked for size of material and spacing by the Commissioner, which will not render the Commissioner responsible for any errors in construction dimensions, quantities, bends, etc. that have been made in preparation of the shop drawings. The Contractor must assume full responsibility for the correctness of quantities, dimensions and fit.
   5. Do not order or deliver reinforcement to job site prior to approval of drawings.
   6. Indicate location of epoxy-coated bars on the drawings.

D. Quality Control Submittals:
   1. Certificates:
      a. Submit certificate stating that reinforcement meets or exceeds the specified requirements.

b. Submit certification that properly identifies the number of each batch of epoxy coating material used on the project, material, quantity represented, date of manufacture, name and address of manufacturer and a statement that the supplied epoxy-coated reinforcing bars meet the requirements of this specification and the requirements of ASTM A775 including Annex A1.
c. If WWR is used, provide certificate from the manufacturer that WWR meets or exceeds the requirements specified in ACI 318 and provide calculations that it is of equivalent strength to the reinforcing bars that are being substituted.

2. Contractor Qualifications:
   a. Provide proof of Installer qualifications specified under "Quality Assurance".

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Qualifications:
1. Rebar Installer: Company specializing in performing the Work of this Section must have three years minimum experience on successful projects of similar size.

C. Regulatory Requirements:
1. Building Code: Work of this section must conform to all requirements of the 2014 NYC Building Code. Deliveries will be rejected unless:
   a. All reinforcing bars are identifiable as to point of origin, grade of steel and size.
   b. All bundles or rolls of cold drawn steel wire reinforcement are securely tagged to identify the manufacturer, the grade of steel and the size.
2. Where more severe requirements than those contained in the Building Code are given in this Section and ACI 318, the requirements of this Section and ACI 318 will govern.
3. Industry Standards:
   a. Details of Concrete reinforcement not covered herein must be in accordance with "Building Code Requirements for Reinforced Concrete" (ACI 318) and "Details and Detailing of Concrete Reinforcement" (ACI 315), latest editions and the Concrete Reinforcing Steel Institute Manual on "Placing Reinforcing Bars" (CRSI).

1.7 DELIVERY, STORAGE AND HANDLING

A. Store in location to prevent rusting.

B. Protect reinforcement before, during, and after installation.

C. Ensure proper identification after bundles are broken.

D. Epoxy-Coated Reinforcing Bars:
1. Equipment for handling epoxy-coated bars must have protected contact areas. Lift Bundles of coated bars at multiple pick-up points to minimize bar-to-bar abrasion from sags in the bundles.
2. Do not drop or drag coated bars or bundles of coated bars. Store coated bars on protective cribbing.
3. Fading of the color of the coating will not be cause for rejection of epoxy-coated reinforcing bars. Coating damage due to handling, shipment, and placing need not be repaired in cases where the damaged areas is 0.1 in^2 or smaller. Repair damaged areas larger than 0.1 in^2 in accordance with

Article 2.02. The maximum amount of damage, including repaired and unrepaired areas, must not exceed 2% of the surface area of each bar. Bars with greater than 2% damaged areas will be rejected.

E. WWR is shipped in two forms; rolls or sheets. If the rolls or sheets must be lifted by crane at the job site, the Contractor may request the manufacturer to install lifting eyes. At all times during offloading of materials, caution must be exercised and all safety regulations and practices must be observed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Non-coated Reinforcing Bars:
1. All non-coated reinforcing bars, except those to be welded, must be of deformed type of new billet steel conforming to current requirements of ASTM A615. No rail or re-rolled steel will be permitted. Reinforcement to be welded must conform to the requirements of ASTM A706.
2. Grade or yield strength of reinforcing bars are indicated on Drawings.

B. Welded Steel Wire Fabric (WWF)
1. Wire Fabric must conform to the requirements of ASTM A185.
2. Required net area, placement details, and other requirements are indicated on Drawings.
3. Epoxy coating of Welded Wire Fabric must be in accordance with ASTM A884.

C. Welded Wire Reinforcement (WWR)
1. Welded Wire Reinforcement must conform to ASTM A497 and must be made of wire conforming to ASTM A496.
2. Epoxy coating of Welded Wire Reinforcement must be in accordance with ASTM A884.

D. Epoxy-Coated Reinforcing Bars
1. All steel reinforcing bars to be coated must be of deformed type of new steel conforming to current requirements of ASTM A615. Bars must be free of contaminants such as oil, grease or paint. No rail or re-rolled steel will be permitted. Reinforcement to be welded must conform to the requirements of ASTM A706.
2. Grade or yield strength of reinforcing bars are indicated on Drawings.
3. Bars must be epoxy-coated in accordance with ASTM A775.
4. The coating material must be of organic composition meeting the requirements listed in ASTM A775 Annex A1 entitled "Requirements for Organic Coating." Resistance to chemicals, applied voltage, chloride permeability, flexibility, bond strength, abrasion resistance, impact, and hardness must be tested in accordance with Annex A1.

E. Supports for Reinforcement:
1. Non-coated Reinforcement:
a. Supports for reinforcement supported by formwork or deck must consist of metal bolsters and chairs of adequate strength, size, and number. Provide CRSI Class C supports (plastic tipped) for formed concrete surfaces and Class A (bright basic) for metal deck.
b. Supports for reinforcement of slabs supported by ground must consist of above supports with sand plates or horizontal runners. Support for reinforcement of footings/ pilecaps must consist

of the above supports or precast concrete block, 4" square, having a compressive strength equal to that of the concrete being placed.

2. Epoxy-coated Reinforcement:
   a. Epoxy-coated reinforcing bars supported from formwork must rest on coated wire bar supports, or on bar supports made of dielectric material or other acceptable materials. Wire bar supports must be coated with dielectric material for a minimum distance of 2" from the point of contact with the epoxy-coated reinforcing bars.
   b. Reinforcing bars used as support bars must be epoxy-coated. In walls having epoxy-coated reinforcing bars, spreader bars, where specified on the Drawings or shop drawings, must be epoxy-coated. Proprietary combination bar clips and spreaders used in walls with epoxy-coated reinforcing bars must be made of corrosion-resistant material.

F. Tie Wire:
   1. Tie wire for fastening epoxy-coated reinforcing bars must be nylon-epoxy, plastic-coated, or other material acceptable to the City of New York.

2.2 FABRICATION

A. General:
   1. Fabricate reinforcing bars in accordance with fabricating allowances given in ACI 315.

B. Epoxy-Coated Bars:
   1. Surface Preparation:
      a. Clean the surface of the steel reinforcing bars to be coated by abrasive blast cleaning to near-white metal in accordance with SSPC-SP10.
   2. Application of Coating (In Shop):
      a. Apply the coating to the cleaned surface as soon as possible after cleaning and before oxidation of the surface discernible to the unaided eye occurs. However, in no case delay application of the coating more than 8 hours after cleaning.
      b. The coating must be applied by the Electrostatic Spray Method and fully cured in accordance with the recommendations of the manufacturer of the coating material.
      c. Coat ends of bars in accordance with the manufacturer's standards.
   3. Thickness of Coating Material
      a. The film thickness of the coating after curing must be 5 to 12 mils inclusive. Take a minimum of 15 measurements approximately evenly spaced along each side of the test bar. At least 90% of these measurements must be within the specified limits.
      b. Test the thickness of the film coating in accordance with ASTM G12.
   4. Coating Repair: Repair coating damage due to fabrication or handling in cases where damaged area is 0.1 in^2 or greater. Repair all damaged areas larger than 0.1 in^2 with patching material. The maximum amount of damage must not exceed 2% of the surface area of each bar. Patch in accordance with the patching material manufacturer's recommendations. Repair ends of bars cut in the field with the patching material.
   5. Bending of Epoxy-Coated Reinforcement: Bend all epoxy-coated reinforcement cold unless otherwise approved by the Commissioner. When epoxy coated reinforcement bars are field or shop bent, repair coating damage in accordance with paragraph B.4 above. Rollers of bending apparatus must have neoprene collars.

2.3 SOURCE QUALITY CONTROL

A. The City of New York will have the right to inspect the material at all times while work on the Contract is being performed. Epoxy-coated reinforcing bars that do not meet the requirements of this Specification will be rejected. Replace all rejected bars at no cost to the City of New York.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PLACEMENT

A. General
1. Place reinforcement in accordance with CRSI "Placing Reinforcement Bars" and Section BC 1907.5 of the 2014 NYC Building Code.
2. Unless otherwise permitted, welding of crossing bars (tack welding) for assembly of reinforcement is prohibited.
3. Avoid cutting or puncturing vapor barrier during placement.

B. Supports
1. Support and fasten together all reinforcement to prevent displacement by construction loads or placing of concrete.
2. Provide supports specified in Article 2. 1.
3. Provide Continuous High Chair Upper (CHCU) or Continuous Support (CS) for welded wire fabric in the metal deck and place every four feet (4') parallel to the supporting beams.
4. Lifting of bars, welded wire fabric, and welded wire reinforcement into position during placement of concrete is not permitted.
5. Where the concrete surface will be exposed to the weather in the finished structure, the portions of all accessories within 1/2" of the concrete surface must be non-corrosive or protected against corrosion.
6. The following guidelines for WWR support spacing can be used for supported concrete slabs whether formed or placed on composite metal decks.

Wire Size	Wire Spacing	Support Spacing
W or D9 and larger	12” and greater	4-6 ft.
W or D5 to W or D8	12” and greater	3-4 ft.
W or D9 and larger	Less than 12”	3-4 ft.
W or D4 to W or D8	Less than 12”	2-3 ft.
Less than W or D4	Less than 12”	2-3 ft. or less.

C. Cover
1. Provide minimum protective cover given in Section BC 1907.7 of the 2008 NYC Building Code if not indicated on Drawings.

D. Splices
1. All splices not shown on the Drawings must be shown on the shop drawings and approved by the Commissioner.

2. Welded splices - Provide where indicated on Drawings. All welding must conform to AWS D1.4. At these locations, only reinforcement conforming to ASTM A706 will be used.
   a. Provide suitable ventilation when welding epoxy-coated reinforcing bars.
   b. After completion of welding on epoxy-coated reinforcing bars, repair coating damage in accordance with Article 2.2. All welds, and all steel splice members when used to splice bars, must be coated with the same material used for repair of coating damage.
3. Mechanical Connectors
   a. Provide where indicated on Drawings. Install in accordance with splice device manufacturer's recommendations.
   b. After installing mechanical connectors on epoxy-coated reinforcing bars, coating damage must be repaired in accordance with Article 2.2. All parts of mechanical connectors used on coated bars, including steel splice sleeves, bolts, and nuts must be coated with the same material used for repair of coating damage.

E. Embedment Lengths
1. All embedment lengths not shown on the Contract Documents must be shown on the shop drawings and approved by the Commissioner.

3.3 FIELD CUTTING

A. When epoxy-coated reinforcing bars are cut in the field, coat the ends of the bars with the same material used for repair of coating damage.

3.4 TOLERANCES

A. Place reinforcing bars in accordance with the tolerances given in Section BC 1907.5.2 of the 2014 NYC Building Code.

B. Move bars as necessary to avoid interference with other reinforcement, conduits, or imbedded items. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, the resulting arrangements are subject to approval by the Commissioner

3.5 FIELD QUALITY CONTROL

A. Under the requirements of Section BC 1704.4 of the 2014 NYC Building Code, the City of New York will assign a Special Inspector to inspect the size and placement of reinforcement. A record will be made of all inspection of reinforcement at the bending bench and in place.

B. Do not proceed with the completion of wall forms until all reinforcement has been approved and recorded by the Special Inspector.

C. Do not proceed with concreting until all reinforcing in place has been approved and recorded.

D. Promptly correct all reinforcement displaced during pouring of concrete.

E. Damaged reinforcement will not be used.

3.6 CLEANING

A. Steel reinforcement must be free of all rust, scale, oil, paint, grease, loose mill scale, and all other foreign matter that will prevent bonding of concrete and steel just prior to pouring of concrete.

END OF SECTION 03 20 00

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:
   1. Material, equipment, labor and services required to provide for cast-in-place concrete. Work includes but is not limited to structural slabs, concrete fire protection, equipment pads, and installation of miscellaneous inserts. Allow ample time and facility for the Work of other Divisions to be installed. Grouting is part of the Work of Section 03 60 00.

B. Related Sections:
   1. Section 03 10 00 - Concrete Forming and Accessories
   2. Section 03 20 00 - Concrete Reinforcing

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards will be deemed mandatory and applicable to the Work.

B. American Society of Testing and Materials (ASTM) standards, latest editions:
   1. C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
   2. C33 - Standard Specifications for Concrete Aggregates.
   3. C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   4. C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
   5. C78 - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Three-point Loading)
   6. C94 - Standard Specification for Ready-Mixed Concrete.
   7. C127 - Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Course Aggregate.
   8. C131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angles Machine.
   9. C138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
   10. C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
   11. C150 - Standard Specification for Portland Cement.
   12. C172 - Standard Method of Sampling Freshly Mixed Concrete.
   13. C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.

14. C192 - Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
15. C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
16. C260 - Standard Specifications for Air-Entraining Admixtures for Concrete.
17. C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
18. C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
19. C387 - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
20. C494 - Standard Specification for Chemical Admixture for Concrete.
21. C496 - Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.
22. C567 - Standard Test Method for Density of Structural Lightweight Concrete.
23. C685 - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.
24. C882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems used with Concrete by Slant Shear
25. E96 - Standard Test Methods for Water Vapor Transmission of Materials
26. E154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs
27. E329 - Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials used in Construction
28. E1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs
29. E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

C. American Concrete Institute (ACI) standards, latest editions:
1. ACI 117 - Standard 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 212.3R - Chemical Admixtures for Concrete.
5. ACI 214 - Evaluation of Results of Tests Used to Determine the Strength of Concrete.
6. ACI 301 - Specifications for Structural Concrete for Buildings.
7. ACI 302.1R - Guide for Concrete Floor and Slab Construction.
8. ACI 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete.
9. ACI 305R - Hot Weather Concreting.
10. ACI 306R - Cold Weather Concreting.
11. ACI 308 - Standard Practice for Curing Concrete.
12. ACI 309R - Guide for Consolidation of Concrete.
13. ACI 311.4R - Guide for Concrete Inspection.
14. ACI 318-05 - Building Code Requirements for Reinforced Concrete.

D. American Association of State Highway and Transportation Officials:
1. T318 - Water Content of Freshly Mixed Concrete Using Microwave Oven Testing

1.4 DEFINITIONS

A. Light Weight Concrete:
1. Concrete intentionally made to have low density by use of lightweight aggregate conforming to ASTM C330 and required to have an air-dry unit weight less than 115 lb/ft3.

B. Normal Weight Concrete:
1. Concrete for which density is not a controlling attribute, made with aggregates of the types covered by ASTM C33 and usually having unit weights in the range of 135 to 160 lb/ft3.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data:
1. Submit manufacturers' information for the following:
a. Admixtures
b. Hardener
c. Bonding Agent

C. Quality Control Submittals:
1. Design Data: Submit design mixes for concrete, including list of admixtures to be used, to the Testing Agency, the Engineer for Special Inspection, and the Commissioner. Design mix for lightweight concrete must include both the dry and saturated (SSD) weights of the aggregate.
2. Test Reports: Strength Test Report (28 day) for preliminary trial mix (with all admixtures).
3. Certificates
a. Admixture manufacturer's certificate stating that the chloride content of the admixture will not exceed 0.05% by weight.
b. Concrete laboratory license number and certification of meeting ASTM E329 standards.
c. Concrete producer’s certificate stating the plant and trucks are NYSDOT approved.
d. Concrete producer's certificate must be presented at site before concrete is placed in accordance with Chapter 19 of the New York City Building Code
4. Contractor Qualifications
a. Provide proof of Installer and Producer qualifications specified under “Quality Assurance”.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Qualifications:
1. Concrete Installer: Company specializing in performing the Work of this Section must have three (3) years minimum experience on successful projects of similar size.
2. Concrete Producer: Company specializing in the production of concrete must have a minimum of (3) three years’ experience and must be New York State DOT approved plant and use NYSDOT approved trucks.
3. Concrete Laboratory: Concrete laboratory providing design mixes must be New York City licensed and must meet the requirements of ASTM E329.

C. Regulatory Requirements:
1. Building Code: Work of this Section must conform to all requirements of the Building Code of New York City and all applicable regulations of governmental authorities having jurisdiction including safety, health, noise, and anti-pollution regulations. Where more severe requirements than those contained in the Building Code are given in this Specification, the requirements of this Specification must govern.

2. Industry Standards: The ACI Standards listed under references apply to Work of this Section. Where more severe requirements then those contained in the Standards are given in this Section or the Building Code, requirements of this Section or the Building Code will govern. The Contractor must keep a copy of ACI SP-15 - "Field Reference Manual" at the site.
3. Recommendations or suggestions in the codes and references listed in this Article and under "References" must be deemed to be mandatory unless they are in violation of the Building Code.

D. Certifications:
1. Cast-in-Place Concrete must comply with Chapter 19 of the Building Code of New York City. Materials must be readily identifiable for acceptance, certification and inspection requirements of Section 17 04 .4 of the Building Code of New York City.
2. Cement and aggregate must be acquired from the same source for all work.

E. Coordination:
1. Coordinate this work with the work of other Divisions so that items to be installed are done so correctly and in proper sequence.

F. Pre-Concrete Conference:
1. Prior to the start of the concrete construction schedule, conduct a meeting to review the proposed mix designs and to discuss the required methods and procedures to achieve the required concrete quality. The Contractor must send a pre-concrete conference agenda to all attendees
2. The Contractor must require responsible representatives of every party who is concerned with the concrete work to attend the conference, including but not limited to the following:
   a. Contractor's superintendent - Laboratory responsible for the concrete design mix - Laboratory responsible for field quality control - Concrete subcontractor - Ready-mix concrete producer(s) - Admixture manufacturer(s) - Concrete pumping subcontractor.
3. Minutes of the meeting must be recorded, typed and printed by the contractor and distributed to all parties concerned within five days of the meeting. One copy of the minutes must also be transmitted to the Commissioner for information purposes.
4. The minutes must include a statement by the admixture manufacturer(s) indicating that the proposed mix design and placing techniques can produce the concrete quality required by these specifications.

1.7 DELIVERY, STORAGE AND HANDLING

A. Protect material from the elements and from other damage on the site.

B. Replace and pay for material and work damaged to the satisfaction of the Commissioner.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Adequately protect concrete placed during rain, sleet, or snow, or when the mean daily temperature falls below 40°F or rises above 90°F as provided in Article 3.6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Lightweight Aggregate:
1. Northeast Solite Corporation
2. Norlite Corporation
3. Stalite
4. Or approved equal

B. Admixtures:
1. Euclid Chemical Company, Cleveland, OH 44110
2. Master Builders
3. Sika Chemical Corporation
4. Anti Hydro Company
5. Chem Masters
6. W.R. Grace & Co.
7. St. Lawrence Cement Company
8. Or approved equal

C. Curing Compounds:
1. Euclid Chemical Company, Cleveland, OH 44110
2. Master Builders
3. BASF
4. Or approved equal

D. Bonding Agent:
1. Sto Concrete Restoration Division, Atlanta GA
2. Sika Corp, Lyndhurst NJ
3. Euclid Chemical Company, Cleveland, OH 44110
4. Or approved equal

E. Densifier/Sealer:
1. Euclid Chemical Company, Cleveland, OH 44110
2. Curecrete Chemical Company, Inc., Springville, UT 84663
3. W.R. Meadows
4. Or approved equal

F. Fireproofing Accessories:
1. Equipment Distribution Corporation, Ridgefield Park, N.J., 07660
2. Hilti Construction Chemicals, Inc.
3. 3M Fire Protection Products
4. Specified Technologies Inc. (STI)
5. Or approved equal

2.2 MATERIALS

A. Cement must conform to ASTM C150 and must be of the non-air-entrained types:
   1. Unless otherwise specified or approved by the Commissioner, cement must be Type I or II.
   2. Type II must be used for exterior pavements.
   3. Cement must not contain ingredients that would result in more than two percent air being entrained in the concrete.
   4. Fly Ash is not permitted in concrete mix.

B. Cementitious Materials:
   1. Provide composite mix of Portland Cement and Ground Granulated Blast Furnace Slag or Blended Hydraulic Cement and limit percentage, by weight of Portland Cement (ASTM C150) to total cementitious material weight for each design mix to 40 percent less than standard regional concrete mix designs.

C. Admixtures:
   1. General:
      a. The use of admixtures must comply with the requirements of Chapter 19 of the 2014 Building Code of New York City.
      b. The final soluble chloride content in concrete, percent by weight of cement, due to the addition of admixtures and other ingredients must not exceed 0.05 at 28 days. All admixtures must be non-corrosive.
      c. The amount of cement required by the Building Code may be reduced by 8% as per the code with the use of slag cement that has been reviewed and approved by the City of New York.
   2. Air-entraining admixture: Must conform to ASTM C260.
   3. Water-reducing admixture: Must conform to ASTM C494, Type A or D, and contain no more chloride ions than found in drinking water.
      a. Eucon WR-75, Euclid Chemical Company
      b. Pozzolith 200N, Master Builders
      c. Plastocrete 160, Sika Chemical Corporation
      d. Or approved equal
   4. High range, water-reducing admixture (super- plasticizer): Must conform to ASTM C494, Type F or G, and contain no more chloride ions than found in drinking water.
      a. Eucon 37, Euclid Chemical Company
      b. Sikament, Sika Chemical Corporation
      c. ADVA 100, Grace Construction Products
      d. Or approved equal
   5. Water reducing, accelerating admixture: Must conform to ASTM C494, Type C or E, and contain no more chloride ions than found in drinking water.
   6. Water reducing, retarding admixture: Must conform to ASTM C494, Type D, and contain no more chloride ions than found in drinking water.
   7. Slag cement:
      a. ASTM C989, Grade 100 or 120.

D. Water:
   1. Must be clean potable water free of injurious foreign matter conforming to the requirements for water specified in ASTM C94 and suitable for drinking.

E. Aggregates
1. Fine and coarse aggregates must be regarded as separate ingredients. Each size of coarse aggregate, as well as the combination of sizes when two or more are used, must conform to the appropriate grading requirements of the applicable ASTM specifications. Maximum size of coarse aggregate must conform to paragraph 3.3.2 of ACI 318.
   a. Aggregates for normal weight concrete must conform to ASTM C33 and be of Size No.67 and/or No.8.
   b. Aggregates for lightweight concrete must conform to ASTM C330 and be of sizes 3/4" to No.4, 1/2" to No.4, and/or 3/8" to No.8.

F. Bonding Agent:
1. Epoxy/acrylic resin that will not form a vapor barrier with the concrete with the following properties:
   a. Bond strength of 1800 psi in 2 hours when tested in accordance with ASTM C882.
   b. Flexural strength of 2000 psi in 28 days when tested in accordance with ASTM C78.
   c. Tensile strength of 600 psi in 28 days when tested in accordance with ASTM C496.
2. Bonding agent must be "CR246 Sto Bonding and Anti-corrosion Agent" by Sto Concrete Restoration Division, Armatec 110 by Sika Corp, Corr-bond by Euclid Chemical Company or approved equal.

G. Densifier/Sealer:
1. The densifier/sealer compound must be a siliconate-based sealer that penetrates concrete surfaces, increases abrasion resistance and provides a “low-sheen” surface that is easy to clean. The compound must contain a minimum solids content of 20%, of which 50% is siliconate.

2.3 MIXES

A. General:
1. Concrete for all parts of the Work must be of the specified quality capable of being placed without excessive segregation and, when hardened, of developing all characteristics required by the Specifications and Drawings.

B. Strength:
1. Strength requirements given in Part 1 of this Specification are based on 28-day compressive strength, unless high early strength is specified, in which case required strengths are based on 7-day compressive strength.

C. Method of Proportioning:
1. Proportion, batch, and mix concrete in accordance with ACI 318 Section 5.
2. Mix designs are specific to material used, concrete producer, and method of placement. Each mix design must be reviewed by the Commissioner and subsequently accepted by the Engineer designated for Special Inspection prior to placement.

D. Normal Weight Concrete:
1. Unless otherwise specified, proportion and produce normal weight concrete to have a maximum slump of 4” or less. A tolerance of up to 1" above the indicated maximum must be allowed for individual batches provided the average for all batches or the most recent 10 batches tested, whichever is fewer, does not exceed the maximum limit. The slump must be determined by ASTM C143. Concrete containing High Range Water Reducer must have a slump not exceeding 9”, unless

otherwise approved by the Commissioner. The concrete must arrive at the job site at a slump of 2" to 3", be verified, and the HRWR admixture added to increase the slump to the approved level.

2. Where Normal weight concrete is indicated to be air-entrained, provide the following air content for the grading size of coarse aggregate as follows:
   a. No.8.....7 ½ %
   b. No.67.....6%
   c. Tolerance on air content as delivered must be +1.5%.

E. Structural Lightweight Concrete:
1. Lightweight concrete, including concrete used as roof fill and other locations indicated to receive fill, must conform to the following requirements:
   a. Coarse aggregate must be 100% lightweight aggregate, expanded clay, shale, or slate produced by the rotary kiln method, conforming to the requirements of ASTM C330. Provide 3/8" maximum size coarse aggregate for beam and/or column encasement.
   b. The concrete must not exceed an air-dry unit weight of 115 lb/ft3 as measured in accordance with ASTM C567. The wet unit weight of the fresh concrete must be within +3 lbs of the wet unit weight which is to be determined and established from the preliminary tests or prequalified mixes.
   c. Unless otherwise specified, proportion and produce lightweight concrete to have a slump of 3" or less. A tolerance of up to 1" above the indicated maximum must be allowed for individual batches provided the average for all batches or the most recent 10 batches tested, whichever is fewer, does not exceed the maximum limit. The slump must be determined by ASTM C143. Concrete containing High Range Water Reducer must have a slump not exceeding 9”, unless otherwise approved by the Commissioner. The concrete must arrive at the job site at a slump of 3" to 4", be verified, and the HRWR admixture added to increase the slump to the approved level.
   d. Provide the following air content for the grading size of coarse aggregate as follows:
      1) 3/8"...41/2 - 71/2%
      2) 3/4"...4 - 6%
      3) Tolerance on air content as delivered must be +1.5%.
   e. Mix design must include the dry and saturated (SSD) weights of the lightweight aggregate. The saturated weight must take into account the internal and surface moisture content that will be in the aggregate at the time of mixing.
   f. Mix design must be based on the recommendations of the lightweight aggregate producer.

2.4 SOURCE QUALITY CONTROL

A. Tests:
1. The City of New York’s Testing Laboratory will review and/or check test proposed materials for compliance with the Specifications prior to construction.
2. The Testing Laboratory will perform field tests as work progresses as listed in "Field Quality Control".

B. Inspection:
1. Testing Laboratory:
   a. The Commissioner will engage a Licensed Concrete Testing Laboratory to inspect batching of the concrete and perform all field tests. The Laboratory will perform the following services:
      1) Review the Contractor's proposed materials for compliance with the Specifications.

2) Review the Contractor's proposed mix design as required by the Engineer for Special Inspection.
3) Perform tests during construction as required by Section 1905 of the 2014 Building Code of New York City. The Laboratory will obtain samples at the mixer and when directed by the Engineer at the point of placement by the following methods:
   a) Secure composite samples in accordance with ASTM C172. Each sample must be obtained from a different batch of concrete on a random basis, avoiding any selection of the test batch other than by a number selected at random before commencement of concrete placement.
   b) Mold and cure specimens from each sample in accordance with ASTM C31. The minimum number of specimens to be taken daily will conform to ACI 318-05 paragraph 5.6 as modified by the Building Code except that seven (7) test cylinders must be molded for each 50 cubic yards of each class of concrete placed in any one day's concreting. Specimens will be stored at the site in the insulated curing box provided by the Contractor.

b. The Laboratory will be responsible to and under the supervision of the Engineer designated for "Special Inspection".

2. Engineer for Special Inspection:
   a. The City of New York will assign, under the requirements of Section 17 04 .4 of the Building Code of New York City, a Professional Engineer licensed in the State of New York, who will supervise the testing of the materials and the inspection of concrete construction. The Engineer is responsible for use of all approved design mixes, reviewed by the Commissioner, as well as maintaining the Special inspection log book required by The City of New York.
   b. The Engineer for Special Inspection will check that all required tests are made and the results submitted. The Engineer will also report to the Building Department Code Enforcement Official any deviation from the requirements of the Code, as indicated by records of inspection and reports of tests.
3. Notification:
   a. Notify the Commissioner in writing at least forty-eight hours in advance of each concrete placement. The Commissioner will notify the Testing Laboratory immediately to order out the necessary concrete technicians to cover the work.
   b. Once the concrete technicians are ordered out and a cancellation follows, the Contractor will be charged the agreed upon rate per contract for each technician so ordered to appear, unless a cancellation order is issued to the Laboratory with enough notice prior to the concrete placement as agreed per contract.
   c. During the placement of the concrete, notify the Commissioner immediately of any delay at the concrete plant or at the job site.
4. Contractor’s Responsibility for Quality Control:
   a. The Contractor will receive a copy of all reports prepared by the Laboratory and/or Engineer for Special Inspection. Copies of the daily concrete reports prepared by the Engineer for Special Inspection will be available for reference.
   b. The Contractor will therefore be afforded an opportunity to review all reports and mix data and submit to the Engineer for Special Inspection any recommendations in changing the mixes provided they conform to the Code and Specifications. Any testing required because of changes in materials or proportions of the mix requested by the Contractor, as well as any extra testing of concrete or materials occasioned by the failure to meet Specification requirements must be at the Contractor's expense. The Contractor, at any time, can arrange to have

independent tests made at own expense by an approved laboratory and submit the reports and recommendations to the Commissioner.

c. The tests and inspections, as provided in the Code, do not in any way relieve the Contractor of responsibility to construct the Work in accordance with the Drawings and Specifications and to use safe, standard methods of construction at all times, safeguarding the public, workmen, and structure. The Contractor must be solely responsible for the physical control of the materials and concrete mixes, and must see that such mix designs, tests, and controls are in accordance with the Code and Specifications.

d. It must be the Contractor's complete responsibility to adjust, alter, and/or correct any controls necessary in materials and/or concrete operation based upon tests and inspections made by the City of New York or the Contractor's independent tests. If, during the course of the concrete operations, a lower water content or more cement is needed per cubic yard above that used in the approved design mix, provide same at no additional cost to the City of New York.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Prior to placement of concrete, verify that the concrete cover over the reinforcement is that specified on Drawings.

B. Examine all adjoining work on which this Work is in anyway dependent for proper installation and workmanship. Report to the Commissioner any conditions that prevents the performance of this Work.

3.3 PROTECTION

A. Protect adjacent finish materials and previously poured concrete against spatter during concrete placement.

B. Provide and maintain barricades and safeguards around openings, etc. to protect workmen from injury and to comply with all Building Code and OSHA.

3.4 PREPARATION

A. Remove ice, excess water, trash, and rubbish from forms.

B. Remove hardened concrete from inner surfaces of conveying equipment and all formwork, reinforcement, and dowels.

C. Prepare previously placed concrete to be in contact with new concrete in the manner described under "Construction Joints".

D. Prepare existing concrete to be in contact with new concrete by roughening and cleaning the surface and applying a bonding agent. Surface must be free of laitance. Concrete must be placed after agent cures and

within 20 hours of applying bonding agent. If time elapses, apply a new application in accordance with the directions of the manufacturer.

E. In case a conflict arises between concrete as poured and other Work that requires cutting into concrete beams, columns, walls, or slabs, submit requests to the Commissioner, who will issue instructions accordingly. Cutting of concrete is otherwise prohibited.

F. Do not place concrete on frozen ground.

3.5 JOINTS AND EMBEDDED ITEMS

A. Construction Joints:
1. Make joints not shown on Drawings at locations that will least impair the strength of the structure. Such location is subject to the approval of the Commissioner.
2. Thoroughly clean concrete surface of oil, grease, and other contaminants and remove all laitance prior to placement of adjoining concrete. Roughen surface of the concrete in an approved manner that will expose the aggregate uniformly to a 1/4" amplitude and will not leave laitance, loosened particles of aggregate, or damaged concrete at the surface. Dampen surface immediately prior to placement.
3. Properly install all embedded items where required.
4. Provide ample notice and opportunity for items of other Division to be introduced and/or furnished for installation before concrete is placed. Coordinate the Work of the other Divisions so all items are placed in their proper location.
5. Set metal pipe sleeves, sockets, shoes, etc. into concrete to receive fence posts or any other items, all as indicated on details.

3.6 MIXING AND PLACING CONCRETE

A. General:
1. Notify the Commissioner at least 48 hours in advance of each concrete placement. Do not place concrete without approval of the Engineer for Special Inspection. Do not allow rainwater to increase mixing water nor damage surface finish.
2. When placing concrete in cold weather (air temperature below 40°F), concrete must contain either an accelerating admixture or use Type III cement.

B. Mixing:
1. Batch, mix, and transport ready-mixed concrete in accordance with the appropriate sections of ASTM C94. Truck mixers and agitators must be NYSDOT approved. All trucks must have working revolution counters and site gages. Batch all other concretes in accordance with subchapter 7.2 of ACI 301 only if permitted by the Commissioner and Engineer designated for Special Inspection.
2. Batch ready-mixed concrete only in plants that are NYSDOT approved. Only plants that are NYSDOT approved with current certification meeting the requirements for certification of the NRMCA for automatic batching and automatic recording will be permitted. Concrete must be batched by the use of automation.
3. Unless otherwise approved by the Commissioner, concrete must be deposited within 11/2 hours or 300 revolutions of the mixing drum, whichever comes first, after introduction of water to the cement or cement to the aggregate. When the ambient temperature rises above 90°F, the time must be decreased to 1 hour.

4. Batch lightweight concrete using the saturated weight of aggregate, which must take into account the internal and surface moisture content.
5. Tempering and control of mixing water:
   a. Mix concrete only in quantities for immediate use. Concrete that has started to set must not be retempered, but must be discarded. Water must not be added at the site.
   b. For concrete containing HRWR (Superplasticizer), if loss of slump occurs, HRWR may be redosed at the site as long as a "flash set" has not occurred. Redosage procedures must be discussed and approved by the Engineer and the admixture manufacturer at the Pre-Concrete Conference.
6. Weather Conditions:
   a. Cold weather (Air Temperatures below 40°F):
      1) Concrete must have either an accelerating admixture or use Type III cement.
      2) The temperature of concrete delivered at the site must conform to the temperature limitations given in Table 7.6.1.1 of ACI 301.
      3) If water or aggregate is heated above 100°F, combine the water with the aggregate in the mixer before cement is added. Cement must not be mixed with water or with mixtures of water and aggregate having a temperature greater than 100°F.
      4) Detailed requirements are given in ACI 306R.
   b. Hot Weather (Air Temperatures above 90°F):
      1) Cool the ingredients before mixing, or substitute flake ice or well-crushed ice of a size that will melt completely during mixing for all or part of the mixing water if, due to high temperature, low slump, flash set, or cold joints are encountered.
      2) Detailed requirements are given in ACI 305.
   c. Admixtures – General:
      1) Add all admixtures prior to mixing unless otherwise specified or directed.
      2) Air-entraining admixtures and other chemical admixtures must be charged into the mixer as solutions and must be measured by means of an approved mechanical dispensing device. The liquid must be considered a part of the mixing water. Admixtures that cannot be added in solution may be weighed or may be measured by volume if so recommended by the manufacturer. The accuracy of measurement of any admixture must be within ±3 percent.
      3) If two or more admixtures are used in the concrete, add them separately to avoid possible interaction that might interfere with the efficiency of either admixture or adversely affect the concrete. Do not charge admixtures into the mixer in such a manner that they will come in direct contact with the cement.
      4) Use of accelerating admixtures or Type III cement must not relax cold weather placement requirements.
      5) Use of retarding admixtures in hot weather must be approved by the Engineer for Special Inspection. Use of such admixtures will not relax hot weather placement requirements.

C. Placing:
   1. General: Place concrete in accordance with ACI 304R and ACI 318.
   2. Conveying:
      a. Handle concrete from the mixer to place of final deposit as rapidly as practicable by methods that will prevent separation or loss of ingredients and in a manner that will assure that the required quality of concrete is obtained.
      b. Conveying equipment must be approved and must be of a size and design such that detectable setting of concrete must not occur before adjacent concrete is placed. Conveying equipment

must be cleaned at the end of each operation or workday. Conveying equipment and operations must conform to the following additional requirements:

1) Truck mixers, agitators, and non-agitating units and their manner of operation must conform to the applicable requirements of ASTM C94.

3. Depositing: Detailed recommendations are given in ACI 304R.
   a. General:
      1) Deposit concrete continuously, or in layers of such thickness that no concrete will be deposited on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, locate construction joints at points as provided for in the Drawings, shop drawings, or as approved.
      2) Carry out placement at such a rate that the concrete that is being integrated with fresh concrete is still plastic. Do not deposit concrete that has partially hardened or has been contaminated by foreign material.
      3) Remove temporary spreaders in forms when the concrete placing has reached an elevation rendering their service unnecessary. They may remain embedded in the concrete only if made of metal or concrete and if prior approval has been obtained.
      4) Placing of concrete in supported elements must not be started until the concrete previously placed in columns and walls is no longer plastic.
   b. Segregation: Deposit concrete as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to any procedure that will cause segregation. The maximum drop height must be five feet. Provide drop tubes for placement in forms and other locations where drop height exceeds the indicated maximum.
   c. Consolidation:
      1) Consolidation of concrete and the use and type of concrete must be in accordance with ACI 309R.
      2) Where a surface mortar is to be the basis of the finish, the coarse aggregate must be worked back from the forms with a suitable tool so as to bring a full surface of mortar against the form, without the formation of excessive surface voids.
      3) Consolidate all concrete by vibration so that the concrete is thoroughly worked around the reinforcement, around embedded items and into corners of forms, eliminating all air or stone pocket or weakness. Internal vibrators must be the largest size and most powerful that can be used in the Work, as described in Table 5.1.5 of ACI 309R, with a minimum frequency of 8000 revolutions per minute and must be operated by competent workmen. Over vibrating and use of vibrators to transport concrete within forms is not permitted. Insert and withdraw vibrators at many points, from 18" to 30" apart. At each insertion, the duration must be sufficient to consolidate the concrete but not sufficient to cause segregation, generally from 5 to 15 sec duration, and must reach the bottom of the pour. Keep a spare vibrator on the job site during all concrete placing operations. Provide one non-metallic vibrator when consolidating concrete with galvanized reinforcing.
4. Cold Weather Concrete Placement and Protection: Detailed requirements are given in ACI 306.
   a. When the mean daily temperature of the atmosphere is less than 40°F during concreting, or within 72 hours there after (or the air temperature is not greater than 50°F for more than one-half of any 24-hr period for a period of 3 consecutive days), follow the procedures outlined in ACI 306R to protect the concrete. Provide a cold weather concreting plan as well as list of equipment and material (e.g., thermometers, blankets) to be used to the Engineer designated for Special Inspection. Temperature of the plastic concrete must be no lower than 55°F. Heat all

forms, reinforcing steel, and surfaces to receive concrete above the freezing point and keep them completely free of frost, snow, and ice. Protection must consist of insulating boards, blankets, or heated enclosures. Underside of slabs must be heated during placement and protection period. Initial protection period must be as indicated in tables 5.1 and 5.3 of ACI 306R. Maximum temperature drop of concrete surface after protection is removed must follow table 5.5 of ACI 306R.

5. Hot Weather Placement and Protection: When the mean daily temperature of the atmosphere is over 90°F during concreting, follow the procedures outlined in ACI 305R to protect the concrete.
   a. All concrete, at the time it is actually deposited in the forms, must have a temperature not lower than 50°F but never above 90°.
   b. Cover reinforcement with water-soaked burlap to cool steel so its temperature will not exceed the ambient air temperature immediately before concrete placement.
   c. Dry surfaces that are to receive concrete should be wet down before commencing placement of concrete and the temperature of such surfaces should not exceed the temperature of the concrete being placed.

3.7 FINISHING OF FORMED SURFACES AND REPAIR OF SURFACE DEFECTS

A. General:
   1. Remove forms as soon as practicable. Refer to Section 03 10 00.
   2. Repair surface defects, including tie holes and cracks, immediately after form removal. Patches must be of quality to match the specified finish.
   3. Remove oil, grease, compounds, and other contaminants from surfaces and areas to be repaired, those surfaces in contact with sprayed fireproofing, and those receiving coatings (i.e., plaster, waterproofing, paint, and membranes of any kind).
   4. Provide finishes specified below immediately after form removal.
   5. Provide curing and protection.

B. Repair of Surface Defects:
   1. Remove all honeycombed and other defective concrete down to sound concrete. If chipping is necessary, the edges must be perpendicular to the surface or slightly undercut. Undercut all cracks a minimum of 1" x 1". No featheredges will be permitted. Dampen the area to be patched and an area at least 6" wide surrounding it to prevent absorption of water from the patching mortar. A bonding grout must be prepared using a mix of approximately 1 part cement to 1 part fine sand passing a No. 30 mesh sieve, mixed to the consistency of thick cream, and then well brushed into the surface.
   2. The patching mortar must be made of the same materials and of approximately the same proportions as used for the concrete, except that the coarse aggregate must be omitted and the mortar must consist of not more than 1 part cement to 2-1/2 parts sand by damp loose volume. Substitute white Portland cement for a part of the gray Portland cement on exposed concrete in order to produce a color matching the color of the surrounding concrete, as determined by a trial patch. If the material color cannot be matched properly, the Contractor must use a specialty repair mortar of the Commissioner's choice at the Commissioner's discretion. The quantity of mixing water must be no more than necessary for handling and placing. Mix the patching mortar in advance and allowed to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that will permit placing.
   3. After surface water has evaporated from the area to be patched, brush the bond coat well into the surface. When the bond coat begins to lose the water sheen, apply the premixed patching mortar. The mortar must be thoroughly consolidated into place and struck off so as to leave the patch slightly

higher than the surrounding surface. To permit initial shrinkage, leave it undisturbed for at least 1 hr before final finishing. Keep the patched area damp for 7 days. Do not use metal tools for finishing a patch in a formed wall that will be exposed.

C. Tie Holes and Other Repairs:
1. Remove ties, nails, and other form accessories below the concrete surface when the surface is exposed to view, the elements, or for surfaces to receive waterproofing. For surfaces not exposed to view or the above-mentioned conditions, remove metal to the surface. Refer to Section 03 10 00.
2. Undercut surfaces of holes. After cleaning and thoroughly dampening the holes, fill them solid with the patching mortar. The mortar must match the color of the existing concrete for concrete exposed to view as specified in paragraph B.2 above.

D. Formed Finishes:
1. Rough Form Finish:
a. Provide for concrete not exposed to view unless otherwise indicated under "Finishing" below.
b. Formwork material given in Section 03 10 00.
c. Repair surface as indicated in B. and C. above.
d. Chip or rub off fins exceeding 1/4" in height.
2. Smooth Form Finish:
a. Provide for concrete exposed to view, concrete receiving sheet membrane waterproofing. Areas exposed to view must have a CS 3 or better finish.
b. Formwork material is given in Section 03 10 00.
c. Repair surfaces as indicated in B. and C. above.
d. Chip or rub off fins completely and grind smooth.
e. Provide smooth rubbed finish unless otherwise indicated below.

E. Finishing:
1. Smooth Rubbed Finish:
a. Provide for smooth form finish except for those items listed in 2 below.
b. Produce on newly hardened concrete no later than the day following form removal.
c. Wet the surfaces and rub with a No. 16 carborundum brick or other equal abrasive to obtain a smooth, even surface of uniform appearance without applying any cement or other coating.
d. Obtain the final finish by thoroughly rubbing with a No. 30 carborundum brick. The surface must be wet for a period of 3 days. The Commissioner must be the sole judge of whether the finish is proper.

F. Acceptance of Concrete Finish:
1. If the finish produced is not acceptable to the Commissioner, the Contractor must be responsible for all costs incurred to produce an acceptable finish by whatever means determined by the Commissioner.

3.8 SLABS

A. Placement:
1. Mixing and placing must be carefully coordinated with finishing. Do not place concrete on the subgrade or forms more rapidly than it can be spread, straight edged, and darbied or bull floated. Provide leveling, floating, troweling, etc. at the correct time interval after poring to prevent dusting

and a non-durable surface as specified in ACI 302.1R. These operations must be performed before bleeding water has an opportunity to collect on the surface.

2. To obtain good surfaces and avoid cold joints, the size of finishing crews must be planned with due regard for the effects of concrete temperature and atmospheric conditions on the rate of hardening of the concrete.
3. Provide extra concrete as required to make up for any deflections in the metal deck or formed slab in order to provide a level surface. Measure the concrete depth at the beams and screed from beam to beam.

B. Leveling and Finishing

1. Floor flatness/levelness tolerances
   a. $^{F}_{F}$ defines the maximum floor curvature allowed over 24 inches. Computed on the basis of successive 12 in.) elevation differentials $^{F}_{F}$ is commonly referred to as the "Flatness F-Number."
      1) $^{F}_{F}$ = 25
   b. Maximum difference in elevation, in decimals of an inch between successive 12" elevation differences.
      1) $^{F}_{L}$ defines the relative conformity of the floor surface to a horizontal plane as measured over a 10 ft. (3.05 m) distance.
      2) $^{F}_{L}$ = 20
   c. Maximum difference in elevation, in decimals of an inch, between two points separated by 10 ft.
2. All floors must be measured in accordance with ASTM E-1155 "Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System (Inch-Pound Units).
3. All trowel finished slabs must achieve an overall tolerance of $^{F}_{F}25/^{F}_{L}20$ and all float finished surfaces must achieve an overall $^{F}F20/^{F}_{L}17$ tolerance. The minimum local tolerance (1/2 bay or as designated by the Commissioner) must be 2/3 of the specified tolerances. All topping slabs must achieve a tolerance of $^{F}_{F}50$.
4. Finishes
   a. Surfaces which receive bonded applied cementitious applications such as full-set vitreous ceramic tile, concrete fills and toppings, cementitious membrane waterproofing: Strike off and level to the proper elevation. After the topping has stiffened sufficiently to permit the operation, float the surface to a uniform sandy texture. The surface must then be broomed to a texture as approved by the Commissioner.
   b. Surfaces to receive floor coverings, such as resilient flooring, thin-set terrazzo and vitreous ceramic tile, carpeting, wood floors, or surfaces that are exposed or painted finishes such as at auditorium floors, unless specified otherwise: Steel trowel surface to a smooth dense finish, free of trowel marks, grooves, depressions and ripples with a tolerance no greater than ±1/8" in ten feet. Exposed or painted slabs are to have a “hard trowel” finish. Apply densifier/sealer to slabs exposed or painted, except for those specified below to have no finish. Apply two coats in accordance with the manufacturer's instructions at the proper time.
   c. Surfaces intended to receive roofing, water-proofing membranes: Level and wood float surface. Leave surface free from depressions, bulges, rough spots, and other defects.
   d. Surfaces with no finishes: Areaways, pipe and duct, and crawl spaces; Level and wood float surface level or toward drains if required.
   e. Pavements: Finish surface to a true smooth plane and texture with a toothed roller or float with a wood float. Score concrete pavement in squares of approximately 5'-0" and/or as shown on

Drawings. Each rectangular slab must have all edges neatly rounded with proper tools and be bounded on all sides by a troweled border about 1" in width.

f. Ramps, Driveways, Exterior Concrete Steps: Level and float surface. Follow with a broom finish perpendicular to direction of traffic.

C. Structural Lightweight Concrete Fill:
1. Structural lightweight concrete fill is required at the following location:
a. As a gradient fill on the roof slab to obtain the required slope.
b. As a gradient fill to receive setting beds where structural slab is more than 2" below finished floor level.
c. Other areas as indicated on Drawings.
2. Prepare concrete surface to receive fill by cleaning laitance, grease, oil, dust, etc. by mechanical or other acceptable means.
3. Immediately prior to placement of fill, dampen surface (without leaving standing water) and scrub in bonding grout composed of a mix of approximately 1 part cement to 1 part fine sand passing a No. 30 mesh sieve, mixed to the consistency of thick cream or the bonding agent. Do not allow bonding grout to set or dry before fill is placed.
4. Provide finish as specified in paragraph B of this Article.

3.9 CURING AND PROTECTION

A. General:
1. Begin curing concrete immediately after placement and finishing. Protect all freshly deposited concrete from premature drying and excessively hot or cold temperatures and maintain it with minimal moisture loss at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the concrete. Detailed procedures are given in ACI 308.
2. Cure floor surfaces in accordance with ACI 308.
3. Do not apply curing compounds to any concrete surfaces, provide wet curing.

B. Procedure:
1. Concrete surfaces not in contact with forms:
a. Ponding or continuous non-manual sprinkling.
b. Absorptive mat or fabric, sand, or other covering kept continuously wet.
2. Concrete surfaces in contact with forms:
a. Minimize moisture loss from forms exposed to heating by the sun by keeping forms wet until they are removed.
b. After form removal, cure with one of the methods listed in 1 above.
3. Continue curing until a total of 7 days has elapsed during which the temperature of the air in contact with concrete has remained above 50°F. Prevent rapid drying during and at the end of the curing period.

C. Cold Weather Curing:
1. Concrete must be protected from water loss. This must be accomplished by the application as soon as possible without harm to the concrete surfaces of either (a) exhaust steam, or vapor-resistant paper or polyethylene film. In all other respects, curing must conform to applicable provisions of this Section. Concrete temperature must be maintained between 50°F and 70°F.

D. Hot Weather Curing:
   1. During the period June 1 to October 1 or when hot weather conditions require it, maintain continuous water curing for a minimum period of twenty-four hours. Provide for windbreaks, shading, and other necessary provisions.
   2. After 24 hours, curing must be by one of the methods specified under B above. In all other respects, curing must conform to applicable provisions of this Specification. Upon termination of the specified moist curing, every effort should be made to reduce the rate of drying by avoiding air circulation.

E. Protection from mechanical injury: Protect concrete from mechanical disturbances during curing period as described under "Protection and Cleaning".

3.10 FIELD QUALITY CONTROL

A. Tests: Tests to be performed by The City of New York's Testing Laboratory during construction are as follows:
   1. Compliance of materials to Specifications tested from production samples. Use ASTM C712 reference and test for freshly mixed concrete sample. Determination of the slump of the concrete for each sample taken and whenever consistency of the concrete appears to vary using ASTM C143. The Engineer designated for Special Inspection will report any concrete that does not meet the slump requirements to the Commissioner who will determine the acceptance of said concrete.
   2. Determination of water content of freshly mixed normal weight concrete must be from the batch tickets accompanying the concrete mix. All batch tickets must be recorded by the Special Inspector including when the truck is not selected for random inspection and testing. The Engineer designated for Special Inspection will report any concrete that does not meet the water-cement ratio (W/C0 requirements to the project Commissioner who will determine the acceptance of said concrete.
   3. Strength tests on the specimens in accordance with ASTM C39. The minimum number of specimens to be taken daily will conform to ACI 318-89 paragraph 5.6 as modified by the 2014 New York City Building Code except that seven (7) test cylinders will be molded for each 50 cubic yards, or portions thereof, of concrete placed in any one day's concreting. Specimens will be stored at the site in the insulated curing box provided by the Contractor. Each group of specimens is considered one strength test. Three cylinders must be tested at 28 days for acceptance and one at 7 days for information. The three remaining cylinders will be tested only if the 28-day breaks are low and durability of the concrete is not a factor. If one specimen in a test manifests evidence of improper sampling, molding, or testing, it must be discarded and the average strength of the remaining cylinders will be considered the test result. Should all specimens in a test show any of the above defects, the entire test must be discarded.
   4. Determination of air content and unit weight of normal weight concrete sample for each strength test in accordance with ASTM C173 or C231 and ASTM C138.
   5. Determination of air content and unit weight of lightweight concrete sample for each strength test in accordance with ASTM C173 or C231 and ASTM C567.
   6. Determination of temperature of concrete sample for each strength test. Use ASTM C1064 to determine temperature of concrete sample.

B. Inspection:
   1. Refer to "Source Quality Control" for responsibility and procedure.
   2. The Contractor must cooperate in the making of all tests by the Laboratory Technician by:
      a. Providing a well-constructed shanty, to be approved by the Commissioner. This shanty shall have an area of not less than 50 sq ft, be well lighted, and provided with a table for mixing

concrete, shelves for storage of the Laboratory's equipment, molds, etc., one chair, hinged door with suitable lock.

b. Providing a pre-manufactured field portable curing box with built-in temperature controlled system for humidity, heating and cooling in conformance to ACI 301 and ASTM C31, C192 and C511; curing box of sufficient size and strength to contain all specimens made in any four consecutive working days, minimum 22 standard 6" x 12" cylinder molds without stacking cylinders; and controls for which must automatically raise or lower temperature as needed to maintain 72°F ±3°F through -10°F to 100°F temperature gradient.. The Contractor must furnish an outlet to provide the necessary temperature in the storage box, pending delivery to the Laboratory of the test cylinders.

c. Locate curing box within 30 yards of the concrete sample collection area. Relocate curing box as required due to the progress of the work. Provide additional curing boxes as required to maintain the 30 yard limit if multiple concrete collection areas are scheduled.

d. Providing a microwave of the size specified in AASHTO T318 and a portable generator.

C. Evaluation and Acceptance of Concrete:

1. Strength tests on structural concrete will be evaluated according to ACI 318-05, paragraph 5.6 as modified by the 2014 New York City Building Code.
2. When the average strength of the test cylinders, as defined in ACI 318-05 paragraph 5.6 as modified by the 2014 New York City Building Code, falls consistently below the specified strength (f'c), the Commissioner will have the right to order the Contractor to change the proportions or the water content of the concrete to secure the required strength for the remaining portion of the structure, all at the Contractor's expense. It is the Contractor's complete responsibility to modify the concrete mix design, material controls, and/or concrete operations where necessary to obtain the compressive strength required by the design and Specification.
3. When the average strength of test cylinders for any portion of the structure is less than that required by the design or Specification, or where there is other evidence that the quality of the concrete is below Specification requirements, the adequacy of the concrete will be checked according to the requirements of the 2014 New York City Building Code, either by structural analysis or by core or load tests or by any combination of these procedures. The Commissioner will determine which procedures to use:
   a. Structural Analysis Computations, which will be performed by the Commissioner.
   b. Core Tests - Performed in accordance with ASTM C42.
   c. Load Tests.
4. Exterior concrete exposed to the elements with low strength test results or other evidence of poor durability will be rejected.
5. Low Strength Tests of Concrete - Results
   a. Pay for additional costs of labor and materials required at the job for all damages resulting from load tests and the taking of cores. Remove and replace concrete work that is not of adequate strength or durability and cannot be made to work by remedial methods acceptable to the Commissioner at the Contractor's cost. The Contractor must be held responsible for all delays and damages to the work of other Divisions that occur as a result of non-conformance.
   b. Pay for all expenses resulting from low strength test procedures or evidence of poor durability (such as high slump) specified above.

3.11 PROTECTION AND CLEANING

A. General:

1. During the curing period, and thereafter as conditions may require, protect the concrete from damaging mechanical disturbances, particularly excessive load stresses, heavy shock, and excess vibration. Protect all finished concrete surfaces from damage caused by construction equipment, materials or methods, and by rain or running water. Self-supporting structures must not be loaded in such a way as to overstress the concrete.

B. Floors:
1. Floors that have received their final finish must be closed to all traffic for at least 48 hours following the completion of troweling. Avoid damage to the floor and repair, clean, and prep floor for finishes.

3.12 ACCEPTANCE OF CONCRETE WORK

A. General:
1. Completed concrete work that meets all applicable requirements will be accepted without qualification.
2. Completed concrete work which fails to meet one or more requirements but which has been repaired to bring it into compliance will be accepted without qualification.
3. Completed concrete work which fails to meet one or more requirements and which cannot be brought into compliance may be accepted or rejected as provided in these Specifications or in the Contract Documents. In this event, modifications may be required to assure that remaining work complies with the requirements.
4. Concrete work judged inadequate by structural analysis, core test, results of load test or deemed unacceptable due to appearance or durability concerns must be repaired, reinforced with additional construction if so directed by the Commissioner, or be replaced if so directed by the Commissioner at the Contractor's expense.

B. Dimensional Tolerances:
1. Formed surfaces resulting in concrete outlines smaller than permitted by the tolerances of Section 03 10 00 must be considered potentially deficient in strength and subject to the provisions of paragraph D below.
2. Formed surfaces resulting in concrete outlines larger than permitted by the tolerances of Section 03 10 00 may be rejected and the excess material subject to removal. If removal of the excess material is permitted, it must be accomplished in such a manner as to maintain the strength of the section and to meet all other applicable requirements of function and appearance.
3. Concrete members cast in the wrong location may be rejected if the strength, appearance, or function of the structure is adversely affected or if misplaced items interfere with other construction.
4. Inaccurately formed concrete surfaces exceeding the limits on Section 03 10 00 and which are exposed to view may be rejected and must be repaired or removed and replaced if required.
5. Slab tolerance from theoretical is 1/2" plus or minus in accordance with ACI 117. Finished slabs exceeding the tolerances, including specified levelness tolerances, may be repaired provided that the strength or appearance is not adversely affected. High spots may be removed with a terrazzo grinder, low spots filled with a patching compound, or other remedial measures performed as permitted.

C. Appearance:
1. Concrete exposed to view with defects that adversely affect the appearance of the specified finish may be repaired only by approved methods.
2. Concrete not exposed to view is not subject to rejection for defective appearance.

D. Strength of Structure:
   1. The strength of the structure in place will be considered potentially deficient if it fails to comply with any requirements that control the strength of the structure, including but not necessarily limited to the following conditions:
      a. Low concrete strength as described under "Field Quality Control".
      b. Reinforcing steel size, quantity, strength, position, or arrangement at variance with the requirements of Section 03 20 00 or the Contract Documents.
      c. Concrete that differs from the required dimensions or location in such a manner as to reduce the strength.
      d. Curing less than that specified.
      e. Inadequate protection of concrete from extremes of temperature during early stages of hardening and strength development.
      f. Mechanical injury as defined under "Protection and Cleaning", construction fires, accidents, or premature removal of formwork likely to result in deficient strength.
   2. Structural analysis and/or additional testing may be required when the strength of the structure is considered potentially deficient.
   3. Core tests may be required when the strength of the concrete in place is considered potentially deficient.
   4. If core tests are inconclusive or impractical to obtain or if structural analysis does not confirm the safety of the structure, load tests may be required and their results evaluated in accordance with Chapter 20 of ACI 318.

END OF SECTION 03 30 00

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SECTION 03 60 00 - GROUTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Furnishing material, equipment, labor, services required to provide non-shrink grout. Work includes, but is not limited to grouting under steel and mechanical equipment base plates, filling of fence and rail posts sleeves, grouting of piping, and wherever else shown on Drawings.

B. Related Sections:
   1. Section 05 12 00 - Structural Steel Framing
   2. Section 05 50 00 - Metal Fabrications

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards will be deemed mandatory and applicable to the Work.
   1. American Society of Testing and Materials (ASTM) Standards, latest editions.
      a. ASTM C109 Test Method for Compressive Strength of Hydraulic Cement Mortars.
      b. ASTM C827 Test Method for Early Volume Change of Cementitious Mortars.
      c. ASTM C1107Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink).
   2. Army Corp of Engineers:
      a. CRD C-621 Specification for Non-Shrink Grout.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data:
   1. Submit manufacturer's information on the non-shrink grout, including mixing and installation instructions for each type of application.

C. Quality Control Submittals:
   1. Contractor Qualifications
   2. Provide proof of Contractor qualifications specified under “Quality Assurance”.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Qualifications:
1. Manufacturer: Company specializing in the production of grout must have a minimum of three years’ experience.
2. Installer: Company specializing in performing the work of this section must have three years minimum experience.

1.6 DELIVERY, STORAGE AND HANDLING

A. Materials must be delivered in manufacturer’s sealed and undamaged packaging. Each package must contain clear and legible labels that meet requirements of local, state and federal regulations identifying manufacturer’s name, product name, quantity of material, and batch number.

B. Protect material from the elements and from other damage at site.

C. Replace and pay for material and work damaged to the satisfaction of the City of New York.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not apply grout at temperatures below 40°F. Follow manufacturer's recommendations for placement temperatures, which is typically at an optimum range of 50°F to 80°F. Provide hot and cold weather procedures at other temperatures.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Grout:
1. Sika Corp., Lyndhurst, NJ 07071
2. Euclid Chemical Company, Cleveland, OH 44110
3. Five Star Products, Inc., Fairfield, CT 06824
4. Or approved equal

2.2 MATERIALS

A. Grout:
1. Grout must be non-shrink, non-metallic, cement-based material meeting ASTM 1107 and CRD C-621 with the following characteristics:
a. Minimum compressive strength of 6000 psi @ 28 days when testing in accordance with ASTM C109 or CRD C-621.
b. Slight positive expansion when tested in accordance with CRD C-621 or ASTM C827.
2. Products:
a. SikaGrout 212 by Sika Corp.
b. Dry Pack Grout and NS Grout by Euclid Chemical Company

c. "Five Star Grout" by U.S. Grout 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 all adjoining work on which this Work is in anyway dependent for proper installation and workmanship. Report to the Commissioner any conditions that prevents the performance of this Work.

B. Repair surfaces to receive grout as approved by the Commissioner to ensure that the maximum allowed thickness of material is not exceeded.

3.3 SURFACE PREPARATION

A. Concrete surface must be free of all loose material.

B. Steel must be clean and free of corrosion.

C. Surfaces must be free of oil, grease, loose paint, corrosive deposits, dust, laitance and other contaminants.

D. Sleeves and holes must be clean of water, dust and debris.

3.4 APPLICATION

A. Perform all grouting in accordance with the recommendations of ACI, CSI, and the grout manufacturer's published specifications for site preparation, product mixing, and placing. For grouting in weather below 50 degrees F, contact manufacturer for cold weather instructions.

B. Arrange with the manufacturer of the grout for the services of a qualified field representative to instruct the work crews in the mixing of components, preparation of surfaces, technique of installation, and inspection procedures.

C. Place grout at a no more than “flowable” consistency, carefully using the manufacturer’s recommended water content.

D. Locations:
1. Provide grout 1" thick minimum, 2” thick maximum, unless otherwise specified, under column base plates and beam bearing plates. Work grout under plates to provide full and even bearing. Grouting is to be done prior to placement of any concrete on the structure.
2. Provide grout for grouting fence posts into sleeves. Grout is to be placed at a “plastic” consistency and crowned at the post to shed water away from the post onto the adjoining concrete surface.
3. Provide grout for grouting bars in concrete and for "Dry Packing". Follow manufacturer's procedure for mixing and installation.

4. Provide grout under equipment bases.
5. Provide for grouting in pipes entering precast units.
6. Provide grout wherever else it is indicated on Drawings or Specifications.

E. Follow manufacturer's instructions for curing.

3.5 PROTECTION AND CLEANING

A. Clean all adjacent area of excess material and clean all floors and walls of powder and droppings.

3.6 FIELD QUALITY CONTROL

A. Engage a testing Laboratory to inspect the grouting procedure and take cube specimens to test compressive strength.

B. The Commissioner will inspect and reject any that are of inadequate strength or contains cracks or other defects. These areas must be fixed at Contractor's expense.

C. Engage the services of the material manufacturer's representative to instruct in the proper mixing and usage of the material to ensure the grout is placed at the correct consistency and manner.

END OF SECTION 03 60 00

SECTION 04 20 00 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Work Included: Provide products in accordance with the Contract Documents. The Work of this Section will include but not be limited to the following:
   1. Patching existing masonry partitions where required.
   2. Anchors, ties, and reinforcement.
   3. Concrete Masonry Units.
   4. Mortar and grout.

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria of differing requirements are explicitly stated in the specifications or mandated by governing codes or regulations, the recommendations, suggestions and requirements described in the referenced standards will be deemed mandatory and applicable to the Work.

B. American Society of Testing and Materials (ASTM) standards, latest editions.

1.	A615	Standard Specification for Deformed and Plain Billet – Steel Bars for Concrete Reinforcement
2.	C90	Standard Specification for Hollow, Load-Bearing Concrete Masonry Units
3.	C140	Standard Specification for Sampling and Testing Concrete Masonry Units
4.	C144	Standard Specification for Aggregate for Masonry Mortar
5.	C150	Standard Specification for Portland Cement
6.	C207	Standard Specification for Hydrated Lime for Masonry Purposes
7.	C270	Standard Specification for Mortar for Unit Masonry
8.	C331	Standard Specification for Aggregates for Concrete Masonry Units
9.	C404	Standard Specification for Aggregates for Masonry Grout
10.	C476	Standard Specification for Grout for Reinforced and Non-reinforced Masonry
11.	C578	Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation
12.	C595	Standard Specification for Blended Hydraulic Cements
13.	C780	Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
14.	C1019	Method of Sampling and Testing Grout

C. Industry Standards:
   1. “Standard for Concrete Masonry Units” – UL 618 Underwriters Laboratory
   2. American Welding Society – AWS D1.4 – Structural Welding Code – Reinforcing Steel

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit manufacturer's product data for each type of masonry unit, reinforcement and ties, mortar, Portland Cement, Lime, mortar pigments, sand, masonry reinforcement, anchors, accessory, and other manufactured products, including certifications that each type complies with specified requirements.

C. Quality Control Submittals:
1. Schedule of Uses: By mortar type.
2. CMU producer’s certificates stating aggregate use conforms with ASTM C331 and minimum equivalent thickness and mix design are in conformance with UL 618.
3. Furnish notarized Building Department affidavits from masonry manufacturer (Form 10H & 10J) stating materials delivered to the project comply with specification requirements.
4. Contractor must submit checked shop drawings consisting of complete plans and details of reinforcement, locations of walls, construction joints, etc. for approval before proceeding with the work.
5. The City of New York will assign a special inspector who will inspect the masonry construction under the requirements of NYC Building Code Section 1704.5.
6. Pre-construction testing of mortar properties in accordance with ASTM C780 to provide benchmark for compressive strength of field mixed and factory batched mortar. Adjust proportions and material source as required and do not proceed with masonry work until pre-construction testing is completed.
7. Pre-construction testing of masonry grout properties in accordance with ASTM C1019. Do not proceed with masonry work until pre-construction testing is completed.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Qualifications:
1. Company specializing in the Work of this Section must have a minimum of three years’ experience.

C. Regulatory Requirements:
1. Building Code: Work of this Section must conform to all requirements of the NYC Building Code, including environmental, safety, health, noise and anti-pollution regulations.
2. Masonry construction must conform to the material acceptance, certification and inspection requirements of NYC Building Code Chapter 17, Table 1704.5.1 and NYC Building Code Chapter 21.
3. Comply with cold weather and hot weather construction provisions and requirements as specified in NYC Building Code 2104.3 and 2104.4.
4. Masonry wall construction must conform to ACI 530-02/ASCE 5-02 as modified by the seismic amendment to the NYC Building Code RS 9-6 and UL1999.
5. All detailing, fabrication and erection of reinforcing bars must comply with the requirements of ACI315 and ACI 318-11, Chapters 7 and 12, and NYC Building Code Section 1907.5.
6. Welding of reinforcement to conform to Structural Welding Code AWS D1.4.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver masonry materials to project site in undamaged condition.

B. Store and handle masonry units to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.

C. Store cementitious materials off the ground, under cover and keep dry.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows for each form of concrete masonry unit required.
   1. Provide special shapes including half-units, corner units, half-high units, U-shaped lintel/bond beam units as required to accomplish the Work.

B. Concrete Masonry Units:
   1. Density Classification: Medium Weight, Hollow Load-Bearing conforming to ASTM C90 with aggregate conforming to ASTM C331.
   2. Minimum net-area compressive strength 1900 psi.
   3. Size: 8 by 16 inches unless otherwise indicated. Type and thickness as required to achieve fire rating indicated.

2.2 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I. Provide natural color or white cement as required to produce required mortar color.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate for Mortar: ASTM C 144.

D. Aggregate for Grout: ASTM C 404.

E. Water: Clean and potable, conforming with NYC Building Code section 1903.4.

2.3 MORTAR AND GROUT MIXES

A. General: Do not add admixtures; pigments, air entraining agents, accelerators, retarders, calcium chloride, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.

B. Mixing: Combine and thoroughly mix cementitious materials, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.

C. Mortar for Unit Masonry: Provide Type 1 Portland cement. Comply with ASTM C 270, Type S, Proportion Specification: 1 part gray cement, 1 part lime, 6 parts dry sand for types of mortar required, minimum compressive strength must be 1800 psi at 28 days.

D. Grout for Masonry: Fine Grout: 1 part Portland cement, 0-1/10 part hydrated lime, 2-1/4-3 times the sum of volumes of cementitious materials of fine aggregate (proportions by volumes).

E. Compressive Strength of Grout: At least equal to the strength of the masonry and not less than 200 psi as determined by ASTM C1019.

2.4 JOINT REINFORCEMENT, TIES AND ANCHORS

A. Materials: Comply with ASTM A 82 for uncoated carbon steel wire, hot-dipped galvanized.

B. Truss-Type Joint Reinforcement at exterior walls: Type 304 Stainless Steel, 9 gauge.

C. Slip-Set Stabilizer Anchors: Type 304 Stainless Steel.

D. Mill-galvanized wires and ties may only be used in interior applications.

2.5 REINFORCING STEEL

A. Deformed bars conforming to ASTM A615, Grade 60. Reinforcement to be welded must conform to the requirements of ASTM A706, Grade 60.

B. Reinforcement in exterior construction, such as parapets, must be galvanized in accordance with ASTM A767 or epoxy coated in accordance with ASTM A775 for steel bars. Touch up coating for galvanized material must be in accordance with ASTM A780.

C. Welded wire fabric (wire mesh) must conform to ASTM A185. Epoxy coated reinforcement for wire mesh in accordance with ASTM A933 for concrete exposed to the elements.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION, GENERAL

A. Examine all adjoining Work on which this work is in any way dependent for proper installation and workmanship. Report to the Commissioner any conditions that prevent the performance of this Work.

B. Cover the top of masonry wall with waterproof plastic membrane at the end of the work period, when work is not in progress and when work needs to be protected from rain and other precipitation. Do not wet concrete masonry units.

C. Thickness: Build masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.

D. Cut masonry units with motor-driven saws to provide clean, sharp edges. Cut units to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

3.3 LAYING MASONRY WALLS

A. General: Layout walls for location and bond pattern, with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid using less-than-half size units. Lay units true to dimensions, plumb and level. Set block up with special care for plane, jointing, pattern and cutting.

B. Bond Pattern: Lay masonry in running bond pattern with vertical joint in each course centered on units above and below. Interlock each course of each wythe at corners. Do not use units with less than nominal 4 inch width at corners or jambs.

C. Stopping and Resuming Work: Rake back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of masonry, and remove loose masonry units and mortar prior to laying fresh masonry.

D. Built-In Work: Build in items specified under this and other Sections. Fill in solidly with masonry around built-in items.
   1. Where built-in items are in hollow masonry, place metal lath in the joint below and rod mortar or grout into cores.
   2. Fill hollow masonry with grout 3 courses (24 inches) under lintels and similar items, and as indicated.
   3. Provide necessary cuts to fit tightly in and around mechanical installations. Where sleeves are required in masonry walls, furnish standard wrought iron pipes of necessary sizes and lengths and build in where shown.
   4. Building into partitions and walls: frames for grilles, convectors, access doors, boxes for electrical equipment.

E. Lay CMU blocks with cells vertical. Fill cores containing vertical reinforcement with masonry grout for full height, as the wall is erected.

F. Provide grout in cores of blocks at jambs, parapets, under lintels and where indicated on the Drawings. Reinforce first two courses above all door openings with a layer of truss type reinforcement extending 12” beyond jambs, in addition to the rebars required for seismic reinforcement. Where units meet metal door frames, leave vertical joint open to receive caulking.

G. Control joints must extend full height of partition (floor to underside of slab, deck or beam). Joints must not intersect any structural members in the wall. Wall joint reinforcement must not continue through the control joints.

3.4 MORTAR BEDDING AND JOINTING

A. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course and in all courses to be reinforced and filled at all exterior walls filled with grout.

B. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8 inch joints.

C. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials.

D. Fill bed joints and cross joints solid with mortar. Furrowed bed and spotted cross joints not permitted. For hollow block units, apply mortar full length on all bearing surfaces.

3.5 REINFORCEMENT

A. Reinforce walls with continuous horizontal joint reinforcing embedded a minimum of 2/3 the block width unless specifically noted to be omitted. Provide truss/ ladder type horizontal joint reinforcement, continuous at alternate block courses (16” o.c.) maximum.

B. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement as by manufacturer for continuity.

C. Install reinforcing bars in cells and bond beams at locations and spacing indicated on Drawings.

D. Expansion joints and control joints: Install ‘slip-set’ stabilizer at 24” o.c. vertically in all masonry control and expansion joints of masonry partitions, CMU walls, and multi-wythe brick walls/parapets.

E. Lap ends of adjoining strips of continuous reinforcement 6”.

F. Cells of hollow masonry units containing reinforcing bars are to be filled completely with masonry grout.

G. Install reinforcing bars in bond beam units at depths indicated on drawings. Bars are to be continuous lengths in bond beams over masonry openings.

H. Where indicated, weld reinforcement to steel in accordance with AWS D1.4 and the manufacturer’s written instructions. Keep electrode dry. Oven dry electrode after exposing it for more than 6 hours. Touch-up damaged coatings and weld area upon completion.

3.6 FIELD QUALITY CONTROL

A. The City of New York will assign under the requirements of NYC Building Code Section 1704.5 a Special Inspector who will inspect masonry construction. Where post- installed anchors are utilized, the Special Inspector will perform Special Inspection on post-installed anchors as per Section BC 1704.32. Adhesive anchors installed in concrete in a horizontal or upwardly inclined position supporting sustained tension loads must be installed under continuous Special Inspection as required by paragraph D9.2.4 of ACI 318-11.

B. The Special Inspector will make inspections and any testing deemed necessary. Testing of mortar properties must be in accordance with ASTM C780. Mortar suspected or tested to be too strong or too weak will be subject to petrographic analysis or other methods deemed necessary by the Commissioner and Special Inspector. Testing of masonry grout must be in accordance with ASTM C1019. The Contractor must pay for all tests if they verify improper work.

C. Inspections will include, but not be limited to, the following:
   1. Proper installation of reinforcement, anchors and anchorage of masonry to structural members, frames or other construction.
   2. Proper installation of mortar, including proportioning and mixing. Those mortar properties listed in the Appendix of ASTM C780 are to be tested at the discretion of the Special Inspector or the

Commissioner. Mortar strengths, when tested will be determined in accordance with ASTM C780 using cylinders.

3. Proper installation of weeps, flashing, drip edges, mortar mesh, cleaning of cavity etc.
4. Construction of bed, head and collar joints.

3.7 CLEANING

A. After completion of laying and the completion of other adjacent work liable to soil masonry, clean face work and point all open joints.

B. Start cleaning operations at top and proceed downward, using solution not detrimental to material or mortar.

C. Clean wall surfaces to be painted. Remove mortar from surfaces; remove rough edges from joints. Point up holes and joints. Brush with stiff bristle brush.

END OF SECTION 04 20 00

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SECTION 04 42 13 - ACOUSTICAL BARRIER WALLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Work included:
   1. Acoustic barrier field assembled from 4" thick pre-manufactured components. Barrier is designed to meet performance criteria specified herein as a complete assembly.
   2. Provide labor, material, tools, equipment, scaffolding, transportation, inspection, certificates, and temporary protection necessary to:
      a. Provide Acoustical Barrier as shown on Drawings and as specified in these Specifications. Provide accessories and appurtenances required for complete working installation.
      b. Connectors and flashing must make holes in walls acoustically tight in accordance with barrier wall manufacturer's instructions.

B. Structural steel support frame to be provided by barrier wall supplier. Refer to Specification Section 05 12 00 for general steel requirements.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

B. Product Data: Manufacturer's product specifications.

C. Shop Drawings: Complete drawings showing components including mechanical and electrical requirements.

D. Certificate of Compliance: Certify completed assembly meets requirements specified herein.

E. Stamped (P.E.) calculations for all structural and panel components certifying compliance with 90-MPH wind load. P.E. stamp by a Professional Engineer licensed in The State of New York.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Regulatory Requirements:
   1. Acoustical performance: Minimum NRC (Noise Reduction Coefficient) rating of 1.15 and minimum STC (Sound Transmission Class) of 37 after panel fabrication.
   2. Structural requirements: design panels and attachment system for this installation to withstand wind load of 20 pounds per square foot, both positive and negative.
   3. Reference Standards:

a. ASTM E90-99 or ASTM E90-02 and E413-87 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
b. ASTM C423-90A and ASTM E795-00, Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

1.5 DELIVERY, STORAGE AND HANDLING

A. Advise the manufacture of any delivery conditions including not limited to time of the delivery and parking restriction, etc. prior to shipment.

B. Deliver products in sufficient quantity and time to maintain approved construction schedule.

C. Materials must be in original containers with seals unbroken and labels intact until time of use. Wrapped or bundled materials must bear name of manufacturer and product. Damaged or otherwise unsuitable material, when so ascertained, must be removed from project site.

D. Store products in secure, dry location, out of way of construction operations. Store products off ground and protect from elements. Wetting of elements not permitted.

E. Prevent damage to materials, to other stored products, to existing construction, and project work.

1.6 WARRANTY

A. Provide a two (2) year manufacturer’s warranty covering complete barrier wall system for failure to meet specified requirements.

B. Finish warranty: Furnish panel manufacturer's written warranty covering failure of the factory-applied finish on metal panels within the warranty period. This warranty must be in addition to and not a limitation of other rights the City of New York may have against the Contractor under the Contract Documents.

C. Finish Warranty Period: 10 years.

1.7 ACOUSTICAL PERFORMANCE

A. All tests for validation of barrier panel performance for compliance with these specifications must be conducted by an independent NVLAP certified testing laboratory, National Institute of Standards (NIST) accredited to the most current standard of testing. At a minimum the testing results must conform and be tested to ASTM E90-99 and ASTM E413-87.

B. Submit certified laboratory test including absorption and transmission loss values for specified panel type and construction of not less than following:

1. Octave Band:

Sound Transmission Loss, dB							
Center Frequencies, HZ	125	250	500	1K	2K	4K	STC
Type SLR Concealer 4” thick	18	26	35	45	49	52	37

2. Octave Band:

Sound Absorption Coefficients							
Center Frequencies, HZ	125	250	500	1K	2K	4K	NRC
Type SL Concealer 4” thick	0.92	1.15	1.22	1.13	1.08	1.04	1.15

1.8 EXPERIENCE

A. Materials requiring testing must be manufactured in the same location, with the same equipment for at least three (3) years and have 3rd party, independent testing results no more than three (3) years old.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Acoustical Barrier Wall must be constructed of type "QuietLine" "SLR Concealor" Barrier Panels manufactured by Noise Barriers, LLC., Noishield FS manufactured by IAC acoustics, BBC-EXT-R sound curtains manufactured by Sound seal or approved equal.

2.2 PANEL CONSTRUCTION

A. Except as shown on Drawings or at locations described below, use 4" thick or 5" thick acoustical panels. Exterior surfaces are solid sheet 16-ga. Galvanized steel. Interior surfaces are minimum 22 ga. perforated galvanized steel.

B. Sound-retarding and absorbing fill material must be noncombustible, inert mildew-resistant and vermin proof.

C. Lateral panel reinforcement, if necessary to meet wind load requirements, must be minimum of 18 ga. Cold rolled steel spaced evenly.

D. Spot welds must be no more than 2 inches apart.

E. Prior to attaching face sheet, panel must be dampened and filled with sound-retarding and absorbing elements. Fill must be slightly larger and thicker than inside dimensions of panel. No voids will be tolerated.

F. Weld and rivet face sheet to panel assembly to acoustically compress and hold fill materials in place. Panel assembly must hold fill materials in place under severe conditions of vibration encountered in shipping, installation, and in operation of completed structure.

G. Acoustic fill material must be held back from inside perforated surface by means of an open mesh spacer.

H. Weep holes to permit water runoff must be provided on all horizontal surfaces.

2.3 PANEL CONNECTION

A. Panel to panel connection must be accomplished through interlocking panel edges. Panel design and fit must prevent noise leakage while acoustically and structurally joining panels together. No "H" joiners between panels will be permitted.

B. No mechanical fasteners must be permitted in the face skins of the barrier panels.

C. Weep holes to permit water runoff must be provided on all horizontal surfaces that may trap water.

2.4 PANEL COMPONENTS

A. All accessory trim items must be of 18 ga. minimum galvanized steel, type G90 and must be furnished in factory standard lengths to be field cut to specified dimensions. Location and quantity of sheet metal screws and trim requirements must be in accordance with the barrier wall system manufacturer's installation details.

B. All external panel connections, trim items, accessories, panel interfaces and other sections as noted on the drawings must be sealed with an acoustical sealant that must not harden and prevent disassembly in the future.

2.5 STRUCTURAL STEEL

A. Steel posts must be hot rolled wide flange structural sections in accordance with shapes, sizes, details, and method of connection as shown on the drawings. All structural steel work must conform to ASTM A572 Grade 50 or ASTM A992, and bracing and anchor bolts to ASTM A36. All welds must conform to American Welding Society D1.1 and Electrodes must be E70XX. Structural steel components to be hot dipped galvanized after fabrication. The post design must be sealed by a Professional Engineer licensed in the State of New York.

B. The Steel posts must be installed plumb to within +/-1/16". The posts must be located to the lines and grades specified on the drawings to within a tolerance of +/-1/16". Any accidental coating of concrete on the above grade surfaces must be washed off on the same day of installation.

C. All steel post footing engineering and design is by structural engineers.

D. Provide cross bracing and wind bracing where necessary.

2.6 FINISH PAINT AND PACKAGING

A. Manufacturer's high performance Polyester Powder Paint coating for applications to meet warranty requirements.

B. Apply coatings before, during, or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability. Fully coat all edges of perforations in face sheet.

C. Where detailed in the drawings apply finish coatings to hot dip galvanized structural steel as noted.

D. Protect coating either by application of strippable film or by packing plastic film or other suitable material between panels to protect the finish during shipment. Provide air-drying spray finish in matching color for touch up.
   1. Color: Commissioner will select from manufacturer's standard color chart.

E. Provide sufficient paint to touch-up panels after installation of the Barrier Wall.

F. All panel materials must be shipped in covered wooden crates.

2.7 INTERCHANGEBILITY AND REUSE

A. Acoustic components having same part numbers must be completely interchangeable.

B. Acoustic Barrier Wall must be such that no components will be damaged upon disassembly. Design must allow structure to be assembled, disassembled and reassembled minimum of 3 times without detraction from acoustic performance.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PANEL INSTALLATION

A. Install panels according to manufacturer's instructions noting type, color, length, and recommendations, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal and structural movement.
   1. Field cutting of exterior panels should be approved by manufacturer.
   2. Install panels with exposed fasteners pre-finished to match panel finishes.

B. Accessories: Install components required for a complete acoustical barrier panel system, including trim, coping, supports and attachments, connections between panels, seam covers, sealants, fillers, closures strips and similar items.

3.3 CLEANING AND ADJUSTMENT

A. Damaged units: Replace panels and other components of the work that have been damaged or have deteriorated beyond successful repair by means of finish touch up or similar minor repair procedures.

B. Cleaning: Remove temporary protective coverings and strippable films (if any) as soon as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer, and maintain in a clean condition during construction.

END OF SECTION 04 42 13

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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. Furnish and erect all structural steel as shown on Drawings. Provide shop painting and galvanizing as specified

B. Related Sections:
1. Section 03 60 00 - Grouting
2. Section 05 50 00 - Metal Fabrications

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards will be deemed mandatory and applicable to the Work.

B. American Society of Testing and Materials (ASTM) standards, latest editions:
1. A6 - Standard Specification for General Requirements for Rolled Steel Bars, Plates, Shapes, and Sheet Piling.
2. A36 - Standard Specification for Carbon Structural Steel.
3. A108 - Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.
4. A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
5. A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
6. A194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service, or Both.
7. A307 - Standard Specification for Carbon Steel Bolts and Studs, 60000 psi Tensile Strength.
8. A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
9. A490 - Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
10. A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
11. A501 - Standard Specification for Hot-Formed Welded Seamless Carbon Steel Structural Tubing.
12. A563 - Standard Specification for Carbon and Alloy Steel Nuts.
13. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coating.
14. A992 - Standard Specification for Steel for Structural Shapes for Use in Building Framing

15. F436 - Standard Specification for Hardened Steel Washers.

C. American Institute of Steel Construction AISC 360-05 Specification for Structural Steel Buildings.

D. American Institute of Steel Construction AISC 341-05 Seismic Provisions for Structural Steel Buildings, including Supplement No. 1 dated 2006.

E. "Standard Welding Symbols - A2.0" - American Welding Society (AWS).

F. "Specification for Mild Steel Covered Arc-Welding Electrodes - A5.1" - AWS.

G. "Specification for Low-Alloy Steel Covered Arc-Welding Electrodes - A5.5" - AWS.

H. "Structural Welding Code - D1.1" – AWS, including all supplements, addenda, and special rulings applicable to building construction, except amendments to sections or inspection specified herein.

I. "Code of Standard Practice for Steel Buildings and Bridges" – adopted 2005, AISC.

J. "Solvent Cleaning - SP1" - Steel Structures Painting Council (SSPC).

K. "Hand Tool Cleaning - SP2" - SSPC.

L. "Power Tool Cleaning - SP3" - SSPC.

M. "Commercial Blast Cleaning - SP6" - SSPC.

N. "Pickling - SP8" - SSPC.

O. "Near-white Blast Cleaning – SP10" - SSPC.

P. US Department of Labor (OSHA) Guidelines for Ventilation and Protection in Welding, Cutting and Heating - '1926.353

1.4 DEFINITIONS

A. Structural Steel:
1. Structural Steel consists of the steel elements of the structural steel frame essential to support the design loads. These elements consist of material as shown on the structural steel plan and listed in Article 2.1 of the AISC "Code of Standard Practice for Steel Buildings and Bridges."

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

B. Product Data:
1. Submit manufacturers' specifications for the following products:
a. Primer paints, galvanizing repair paint
b. Expansion/adhesive anchors

C. Shop Drawings:
1. Failure to submit legible shop drawings will be cause for return without review.
2. All connections must be designed by and all drawings must be prepared under supervision of a Professional Engineer licensed in the State of New York. Do not submit unchecked shop drawings. First submissions of all job standards, shop drawings of connections not shown on, or that are in deviation of, the job standards, and calculations must have one set sealed and signed by the Professional Engineer. After final approval of all shop drawings, submit a final set sealed and signed by the Professional Engineer.
3. Shear connections must be designed by the detailer's licensed engineer and detailed by the structural steel detailer, unless otherwise shown on Drawings
4. Immediately after award of Contract and before preparing steel shop drawings, submit for review a set of job standards showing all necessary joint details with full particulars of connection pieces, shop and field welds, and holes for erection bolts and permanent bolts. These will include any moment and shear connections designed by the Commissioner as well as those designed by the detailer. Appropriate marks for designating all types and sizes of joint details must be included. Submit all calculations pertaining to the job standards. After approval of these job standards, the erection plans are to be submitted and must be marked to indicate unmistakably the type and size of joint to be used for every beam connection. Do not order steel in advance of approval of the job standards and the erection plans with joint marks, except at own risk
5. Prepare remainder of steel shop drawings after approval of job standards and erection plans. Drawings submitted prior to approval of job standards will be returned without review. Submit drawings gradually and not all at the same time so that sufficient time is allowed for checking and approval
6. Steel shop drawings must include framing plans, bolted and welded work, and details pertinent data not shown on job standards.
7. Indicate welds by standard AWS symbols and show size, length, and type of each weld in accordance with AWS A2.0.
8. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed under other Sections.
9. Shop drawings will be checked for size of material and strength of connection by the Commissioner, which will not render the Commissioner responsible for any errors in construction dimensions, etc. that have been made in preparation of shop drawings. The Contractor must assume full responsibility for the correctness of dimensions and fit.
10. After shop drawings are 100% complete and approved and all field changes have been made, a CD–ROM of the as-built model must be submitted to the Commissioner.

D. Quality Control Submittals:
1. Furnish notarized Building Department affidavit from steel manufacturer (Form SS24) certifying materials conform to Specification requirements and material was erected as designed.
2. Furnish bolt manufacturer's test reports, covering physical and chemical tests, for each lot of high strength bolts submitted.
3. Furnish steel manufacturer's certificate certifying welders employed on the Work have met AWS qualifications within the previous twelve months and are NYC licensed welders.
4. Furnish complete listing of ASTM's of materials listed in Part 2 of this Section and certification that materials supplied meet those listed.
5. Contractor Qualifications:
   a. Provide proof of Fabricator, Erector, Detailer/Engineer, and Zinc Metallizer qualifications specified under "Quality Assurance".

E. Surveys:
1. Submit signed and sealed copies of surveys conducted by a Licensed Land Surveyor of items listed below. Surveys are to indicate the actual location and elevation and the deviation from theoretical. Highlight those numbers that exceed permissible tolerances. Surveys are to be submitted in a timely manner in order for corrections to be made prior to installation of the next item in sequence (i.e., anchor bolt and base plate survey prior to column installation), including placement of concrete. The following items are to be surveyed:
   a. Anchor bolt location
   b. Elevation of bottom of base plates (top of shims or leveling plate).

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Qualifications:
1. Fabricator: Company specializing in the fabrication of steel products to be used in this Contract must have a minimum of three (3) years’ experience. The fabricator must be AISC certified for Category STD.
2. Erector: Company specializing in performing the Work of this Section must have a minimum of three (3) years’ experience and have done projects with similar quantity of material. A qualified installer must be designated an AISC-Certified Erector, Category ACSE or CSE.
3. Detailer: Company must be specialized in the detailing and design of structural steel shop drawings with a minimum of three (3) years’ experience. Connections must be designed by and shop drawings prepared under direct supervision of a Professional Engineer licensed in the State of New York and experienced in design of this Work.
4. Zinc metallizer: Applicator of zinc metallizing to be certified in accordance with NACE No. 12/AWs C2.23 – Specification for the Application of Thermal Spray Coatings (Metalizing) of Aluminum, Zinc and Their Alloys and Composites for the Corrosion Protection of Steel.

C. Regulatory Requirements:
1. Building Code: Work of this Section must conform to all requirements of the 2014 New York City Building Code, including safety, health, noise and anti-pollution regulations. Where more severe requirements than those contained in the Building Code are given in this Section, the requirements of this Section will govern.
2. Industry Standards: Standards specified herein apply to Work of this Section. Where more severe requirements than those contained in the Standards are given in this Section or the Building Code, requirements of this Section or the Building Code will govern.
   a. "Code of Standard Practice for Steel Buildings" - AISC.
   b. AISC 360-05 Specification for Structural Steel Buildings. As modified by New York City Building Code.
   c. AISC 341-05 Seismic Provisions for Structural Steel Buildings, including Supplement No. 1 dated 2006. As modified by New York City Building Code.
   d. "Specifications for Structural Joints using ASTM A325 or A490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation (RCRBSJ) - AISC.
   e. "Structural Welding Code" - AWS.
3. United States Department of Labor – Occupational Safety & Health Administration covering the requirements for indoor air quality for steel fabricators performing welding operations.

4. Recommendations or suggestions in the codes and references listed in this Article and under "References" will be deemed to be mandatory unless they are in violation of the Building Code.

D. Certifications:
1. Structural steel must comply with Section 22 03 .1 of the 2014 Building Code of New York City. Materials must be readily identifiable for acceptance, certification and inspection requirements of Sections 2203.1 and 1704.4 of the Building Code of New York City).
2. Qualify welding processes and welding operators in accordance with AWS D1.1 Structural Welding Code - Steel.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the site at such intervals as to ensure uninterrupted progress of Work.

B. Deliver anchor bolts and other anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time so as not to delay Work.

C. Store materials to permit easy access for inspection and identification.
1. Shop-primed steel (Painted or galvanized): Primed steel stored in the field or shop must be kept off ground (using pallets, platforms, or other supports) and so positioned as to minimize water-holding pockets, dust and other contamination of the primer. Repair damage to primed surfaces due to improper storage in a manner approved by the Commissioner.
2. Unpainted Steel: Steel stored in field or shop must be kept off ground (using pallets, platforms or other supports), kept clean and in general protected against damage and corrosion.

D. Do not store materials on erected structure in a manner that might cause distortion or damage to the members or supporting structures. Repair or replace damaged materials or structures as directed by the Commissioner.

1.8 FIELD MEASUREMENTS

A. Take field measurements as required by Drawings. Where possible, take field measurements of existing conditions prior to fabrication. Verify that field measurement is same as those shown on Drawings and shop drawings. Report all deviations to the Commissioner in writing.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Paint:
1. Tnemec Co.
2. Carboline
3. Sherwin Williams
4. ZRC
5. Or approved equal

B. Expansion/Adhesive Anchors, Fasteners:
   1. Hilti, Inc.
   2. Powers, Inc.
   3. Simpson Strong-Tie Anchor System,
   4. Or approved equal

C. Zinc Metalizing:
   1. National ThermoSpray,
   2. Thomas-O'Rourke- Gallagher
   3. Hilti, Inc.
   4. Or approved equal

2.2 MATERIAL

A. Structural Steel Shapes, Plates and Bars:
   1. Structural steel W shapes must have a minimum yield strength of 50 ksi conforming to the provisions of ASTM A992. Column Base Plates and Beam Bearing Plates must conform to ASTM A572 Grade 50. For other shapes and steel not listed herewith or within the Contract Documents not available in ASTM A992, steel must have a minimum yield strength of 36 ksi conforming to the provisions of ASTM A36.
   2. Tube steel must conform to the provisions of ASTM A500, Grade B, and HSS Round to the provisions of ASTM A501.
   3. Pipe Steel must confirm to ASTM A53
   4. Structural steel plates must conform to ASTM A572 Grade 50 for plate girders and all other built-up sections. Submit Charpy V-Notch impact test results in accordance with ASTM A6/A6M, Supplementary Requirement S5, Charpy V-Notch Impact Test. The impact test must be conducted in accordance with ASTM A673/A673M, Frequency P, and must meet a minimum average value of 20 ft-lbs (27J) absorbed energy at +70 degree F (+ 21 degree C).

B. Bolts:
   1. Anchor Bolts: Must conform to the provisions of ASTM F1554 Grade 36 or Grade 105. Size and detailing indicated on Drawings.
   2. High-Strength Bolts: Must conform to the requirements of ASTM A325 and ASTM A490 unless otherwise indicated on Drawings.
   3. Expansion/Adhesive Anchors: Provide types as indicated on Drawings. As a minimum, all anchors exposed to weather or embedded in masonry are to be Type 316 stainless steel.

C. Hardware:
   1. Nuts for anchor bolts and unfinished bolts must conform to the requirements of ASTM A563.
   2. Nuts for high-strength bolts must conform to the provisions of ASTM A194 or ASTM A563 as specified in ASTM A325.
   3. Washers must conform to the provisions of ASTM F436.

D. Filler Metal for Welding:
   1. Welding electrode must conform to E70XX classification of AWS A5.1, except as described below.
   2. Electrode must be E7018 unless determined otherwise. E7018 are low hydrogen electrodes that must be kept extremely dry.

E. Structural Steel Primer Paint:
1. Provide type of primer indicated on steel under the following application conditions:
   a. General Application: Modified alkyd rust-inhibitive type containing no lead equal to Tnemec Co. No. 10-99 or Carboline Carbocoat 115-SG. Red oxide paint is not acceptable.
   b. Cavity wall (including steel within the exterior block back-up or not separated from the cavity by a full block), exterior application, and as a primer after zinc metalizing: Epoxy paint - Tnemec Co. Series FC27, Typoxy, Carboline Carboguard 888 or approved equal.
   c. Touch-up primer for cavity wall and exterior application: High adhesion high-solids epoxy coating - Tnemec Co. Series 135, Chembuild, Carboline Carboguard or approved equal.

F. Galvanizing by the Hot-dip Method:
1. Galvanize structural shapes in accordance with ASTM 123.
2. Galvanize hardware in accordance with ASTM A153.
3. Galvanizing repair paint for re-galvanizing welds and damaged areas must conform to ASTM A780 and comply with Military Specification MIL-P-21035, such as ZRC Cold Galvanizing Compound.

G. Galvanizing by the Zinc Metallizing Process:
1. Zinc metallizing is the process of thermally applying an 85/15 zinc-aluminum wire over the surface of steel. It must have the following performance characteristics:
   a. Adhesion of metallizing: An average of 700 psi per ASTM D4541.
   b. Adhesion of epoxy paint to zinc metallizing coating: A rating of 5 out of 5 per ASTM D3359 after system has been exposed to 10 freeze thaw cycles (1 cycle equals 4 hrs @ 100% humidity, 16 hours in freezer, 4 hours in 140^{o} oven.
   c. Corrosion resistance of zinc metallizing:
      1) 0% rust at scribe after 16 months exterior exposure.
      2) A rating of 10 out of 10 (no rusting at scribe) after 4 years natural exposure.
   d. Corrosion resistance of zinc metallizing with epoxy paint: A rating of 10 out of 10 (no rusting at scribe) after 1500 hours slat fog (Profusion Method) when tested in accordance with ASTM D1654.
2. Galvanizing repair paint for regalvanizing welds and damaged areas must conform to ASTM A780.

2.3 SHOP ASSEMBLY - FABRICATION

A. General:
1. Do not fabricate until shop drawings have been approved.
2. Fabricate and assemble steel in shop to greatest extent possible. Fabricate items and assemblies in accordance with AISC Specifications and the shop drawings.
3. Properly mark members for field assembly. Fabricate items in order to match delivery sequence that will expedite erection.
4. Mill base plates, cap plates, and splices to a common plane by means of an approved milling machine.
5. End of beams must be reinforced where cuts or blocks reduce shear or moment strength below required values.
6. Billet thicknesses indicated on column schedule are finished sizes.
7. Maintain facilities capable of performing contractually obligated work. Any shop related deficiency preventing the contractor or detailer to execute the work according to the contract documents will not be just cause for compensation due to performing similar work via other means and methods. Any additional costs incurred must not be at the expense to the City of New York.

B. Shop Connections:
1. Weld or high-strength bolt shop connections as indicated on Drawings.
2. High-strength bolt connections at trusses and all beams connecting into columns are friction (slip-critical) connections. Install high-strength bolts in accordance with "Specification for Structural Joints using ASTM A325 or A490 Bolts" (RCRBSJ).
3. Welding: Comply with "Structural Welding Code" for procedures, appearance, and quality of welds and methods used in correcting welded work.
4. Holes for other Work
   a. Provide holes and openings required for securing other Work to steel framing and for passage of other Work through framing members. Coordinate with Drawings of other Work.
   b. Provide threaded nuts welded to framing, and other specialty items as indicated to receive other Work.
   c. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.
   d. Reinforce all openings with steel shapes as shown on shop drawings.

2.4 SHOP PAINTING

A. General:
1. Apply one shop coat of primer paint on structural steel except as follows:
   a. Steelwork or portions of such to receive sprayed fireproofing. Steel that is exposed to the cavity and within the block back-up is to be galvanized.
   b. Top flanges of structural steel members requiring stud shear connectors or supporting metal deck.
   c. Contact surfaces of structural steel that are to be bolted or welded together.
   d. Surfaces of structural steel within 2" of field welds.
   e. Contact milled bearing surfaces.
   f. Steel members, hardware, and miscellaneous pieces to be embedded in concrete or galvanized.

B. Cleaning and Surface Preparation:
1. Clean all steel first in accordance with SSPC-SP1.
2. Clean steelwork not to be painted (except steel work to be galvanized) in accordance with SSPC-SP2.
3. Clean steelwork to be painted within the same day as it will be applied and in accordance with the following methods, determined by location and exposure:
   a. Interior steel not exposed to view: SSPC-SP2.
   b. Interior steel exposed to view: SSPC-SP3.

C. Shop Coat:
1. Apply structural steel primer paint (general application) at a rate to provide dry film thickness of 2.0 to 3.5 mils. Apply primer paint (cavity wall and exterior application) at a rate to provide dry film thickness of 4.0 to 6.0 mils. Provide full coverage of joints, corners, edges, and exposed surfaces.
2. Apply to dry surfaces only, when surface temperatures are above dew-point, by brush, spray, or roller, thoroughly and evenly, in strict accord with manufacturer's instructions for every detail of handling.
3. Apply second coat of the approved primer, in a darker shade, to surfaces inaccessible to painting after assembly or erection.
4. Protect machined surfaces with an approved rust-inhibiting coating that is readily removable prior to erection.

D. Concrete Contact Surfaces:
   1. Paint steelwork at least two inches into the area in contact with concrete, where applicable.

2.5 GALVANIZING

A. General:
   1. Galvanize the following members:
      a. All steel exposed to the weather.
      b. All connections between the above angles and the supporting structural member, including WT's, hangers, clip angles, hardware, etc.
      c. All exterior steel supporting mechanical equipment (dunnage steel) and any other steel members indicated on Drawings.
      d. Any additional steel members indicated on the Drawings.

B. Cleaning and Surface Preparation:
   1. Hardware (bolts, nuts, etc.): Clean and leave free of mill scale before galvanizing.
   2. Clean all steel first in accordance with SSPC-SP1 if needed.
   3. Steel members: Clean in accordance with SSPC-SP8 before hot-dip galvanizing.
   4. Steel members: Clean in accordance with SSPC-SP10 before zinc metallizing. Surface must have a 3-4 mil anchor pattern. Moisture cannot be present on steel and temperature cannot be less than 5ºF above the dew point. Thermal spray must be applied within 4 hours of blasting.

C. Shop Coat - Hot-dip Galvanizing – Provide for galvanized items not to have finish paint coat.
   1. Galvanize hardware in accordance with ASTM A153.
   2. Galvanize steel shapes in accordance with ASTM A123. Apply zinc coating as per Thickness Grade specified in ASTM A123.

D. Shop Coat – Zinc Metallizing – Provide for galvanized items to have finish paint, which includes all items exposed to public view, including lintels, and other items shown on Drawings or specified herein.
   1. Thermally spray material at a rate of 4-5 mils DFT. Sprayed coating must be free of lumps, blisters, and loosely adhering particles.
   2. After material has cured, apply a shop coat of paint at a rate of 4 to 6 mils DFT.

2.6 SOURCE QUALITY CONTROL

A. Testing:
   1. General:
      a. Structural steel work is subject to all tests required by the Special Inspection requirements of the 2014 Building Code of New York City.
      b. Cooperate with the Testing Laboratory in making all required tests.
   2. Tests: To be performed by the City of New York's Testing Laboratory:
      a. Shop bolted connections: Tested in accordance with AISC specifications.
      b. Shop welding: The laboratory will perform the following functions:
         1) Verify certification of welders.
         2) Visually inspect all welds, record type and locations of defects, and perform tests if necessary. Check all corrected work.
         3) Perform following non-destructive tests if necessary or as required by Engineer for Special Inspection on 25% of applicable welds per the requirements of Special Inspection

per 2014 New York City Building Code Chapter 17. Tests used must be at Engineer for Special Inspection or Testing Laboratory option:

a) Liquid Penetrant Inspection: ASTM E165.
b) Magnetic Particle Inspection: ASTM E709. Perform on root pass and on finished weld.
c) Radiographic Inspection: ASTM E94 or E149. Minimum quality level 2-2T.
d) Ultrasonic Inspection: ASTM E164.

4) 4) Test all members classified as ASTM Groups 4 and 5 and all built up members fabricated with full penetration welds to meet the specifications of ASTM A6 Supplementary Requirement R5.

3. Welding of Critical Joints:
   a. All welded joints that are critical to the integrity of the structure, and require non-destructive testing to assure the adequacy of the critical weld, are indicated on the Drawings.
   b. To ensure general weld quality of less critical groove and butt welds, a quality control program may be required to check the welds by non-destructive testing. The Drawings specify whether non-destructive testing is required and, if necessary, the method of inspection.
   c. Requirements of critical welds and non-destructive testing must be in conformance with Section 17 04 .3 of the Building Code of New York City and AISC 341-04 Appendix Q.

B. Inspection:
1. Testing Laboratory:
   a. The City of New York will engage a Testing Laboratory or Inspection Agency to assist in the inspection of steel fabrication and conduct tests at the mill, shop, or foundry. The laboratory will assist in checking erection tolerances and provide shop and field testing required for all structural steel work, including metal deck and studs.
   b. The Testing Laboratory will be responsible to and under the supervision of the Licensed Professional Engineer designated for "Special Inspection".
2. Engineer for Special Inspection:
   a. The City of New York will assign, under the requirements of Section 1704 of the Building Code of New York City, a Licensed Professional Engineer to supervise the Work listed above under "Testing Laboratory.
3. Notification: Notify the Commissioner before beginning fabrication of the structural steel and supply laboratory with copies of agreements, approved drawings, approved prints of all shop details, etc., and all necessary information relating thereto. Do not ship material to job site until after inspection and approval by the Testing Laboratory.
4. Discretionary Inspections: No mill, shop, foundry, or field inspection, such as is above provided for, must be held to prohibit or preclude inspection of such materials during delivery and erection at the building by such other persons as the Commissioner will direct.
5. Reports: Shop and field reports, including shipments, will be submitted by the Testing Laboratory to the Commissioner as the work proceeds at the shop or job site. A final report will be submitted by the Testing Laboratory when work is completed at the shop, and again when work is completed in the field. The Engineer for Special Inspection reserves right to reject material not in compliance with specified requirements at any time.
6. Corrections: Correct deficiencies in work which inspections and tests have indicated to not be in compliance with requirements. Pay for additional tests, at own expense, necessary to reconfirm any non-compliance of original work and as necessary to show compliance of corrected work.

7. Contractor's Responsibility: Inspection and acceptance or failure to inspect will in no way relieve the Contractor or the mill and shops from their responsibility to furnish satisfactory material strictly in accordance with Drawings and Specifications.
8. One shop location is assumed for purposes of this contract. Where fabrication takes place in more than one shop, additional inspection costs resulting therefrom will be accomplished at the Contractor's expense.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify that field conditions are acceptable and that erection may proceed. Notify the Commissioner in writing of conditions that adversely affect the Work. Do not proceed with erection until conditions have been corrected. Beginning of installation means the erector accepts existing conditions.

3.3 ERECTION

A. General:
   1. Erection must conform to paragraphs Chapter 33 of New York City Building Code.
   2. All work must be erected plumb, square, and true to lines and levels in strict accordance with the structural requirements of the building.
   3. Provide (and obtain any permits and/or certifications for) all machinery, apparatus, and staging required for the erection of steelwork in a thoroughly safe and efficient manner. Install, maintain and remove, without injury to other Work, such temporary bracing, scaffolding, etc. as may be necessary or required. Care must be taken that no part of the structure is overloaded during construction.
   4. Arrange for deliveries of material to facilitate the rapid and continuous progress of operation, but the site or streets adjacent to same must not be used for the storage of material unless absolutely necessary and then only with special permission of the City of New York.
   5. Employ a Licensed Professional Engineer and Land Surveyor to ensure accurate erection of the steel.
   6. Do not alter or cut structural members without written approval of the Commissioner.

B. Temporary Shoring and Bracing:
   1. Provide temporary shoring and bracing members with connections of sufficient strength to bear erection loads and guy wires to maintain structure plumb and in true alignment until completion of erection. Remove temporary work when permanent members and bracing are in place and final connections are made. As erection of the steel progresses, the work must be fastened securely to take care of all dead load, wind and erection stresses. Particular care must be exercised to ensure straightness and tautness of bracing immediately upon raising a steel column. Splices will be permitted only where indicated on the Contract Drawings or the reviewed shop drawings. Poor matching of holes must be corrected by drilling to the next larger size, and the use of larger size bolts.
   2. Welding or re-drilling will not be permitted without approval of the Commissioner. Hammering which will injure or distort the members will not be permitted. Driftpins may be used only to bring together the several parts, and must not be used in such manner as to distort or damage the metal. All

structural steel must have suitable temporary braces and stays to hold it in position until permanently secured.

C. Base and Bearing Plates:
   1. Clean concrete and masonry bearing surfaces of loose and bond-reducing materials.
   2. Set loose and attached base plates and bearing plates for structural members on shims and other adjusting devices, such as leveling plates, within specified tolerances. Elevations of shims and leveling plates must be surveyed and adjusted to correct elevation prior to placement of column or beam. Plates are to have grout holes.
   3. Grouting under plates is part of the Work of Section 03 60 00. Grouting is to be done prior to placement of any concrete on the structure.

D. Field Assembly:
   1. Erect structural frames accurately to lines and elevations indicated. Align and adjust members forming a part of a complete frame or structure before permanently fastening.
   2. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly.
   3. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   4. Level and plumb individual members of the structure within specified tolerances. Do not tighten structure until surveys verify that structure is within allowable tolerances.
   5. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.
   6. Splice members only where indicated and accepted on shop drawings.

E. Connections:
   1. Field connections must be welded or bolted, except where welding is specifically called for on the Drawing.
      a. Provide high-strength bolts for bolted connections. High-strength bolt connections are friction (slip-critical) connections at all moment connections, hanger connections, beam to column connections, lateral framing connections, and brace to column connections. Install high-strength bolts in accordance with "Specification for Structural Joints using ASTM A325 or A490 Bolts."
      b. Provide unfinished bolts where indicated on Drawings. Lock nuts by upsetting bolt end or by similar method when unfinished bolts are not encased in concrete. Tighten all bolts and nuts fully.
      c. Expansion/adhesive anchors or fasteners must be tightened to the torque values specified by the manufacturer.
      d. For ASTM A325 bolts, hardened washer must be installed under the turned element. For ASTM A490 bolts, hardened washer must be installed under the head and nut.
   2. Holes:
      a. The size of bolt holes must be in accordance with AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings."
      b. Ream holes that must be enlarged to admit bolts. Burning or use of drift pins is not permitted.

F. Erection Holes:
   1. Fill erection bolt holes on exposed to view members with plug welds and grind smooth.

G. Lintels and Relieving Angles:
   1. Erect all exterior steel lintels and relieving angles connected (by hangers, clips, bolts or otherwise) to the structural steel work.
   2. Loose lintels (interior and exterior) and lintels secured to concrete are part of the Work Section 05 50 00.

H. Gas Cutting:
   1. Gas cutting in field of primary members to correct fabrication errors is not permitted. Gas cutting of secondary members not under stress is permitted with approval of the Commissioner.

I. Field Touch-Up:
   1. Painted Members: After erection, clean all damaged areas in shop coat, exposed surfaces of bolts, bolt heads, nuts and washers, abrasions, and all field welds and unpainted areas adjacent to field welds to the same standards as the shop coat and paint with primer paint to same thickness as the shop coat. Finish painting is specified in Section 09 90 00.
   2. Galvanized Members: After erection, clean and paint all damaged areas to the galvanizing, welds, and areas adjacent to welds with the galvanizing repair paint. For galvanized members to be painted, finish painting is specified in Section 09 90 00 and must be the final two coats of the epoxy paint system.

3.4 TOLERANCES

A. Erection tolerances must be in accordance with "Code of Standard Practice for Steel Buildings and Bridges", except as indicated in B below.

B. The following overall maximum deviations (tolerances) from theoretical are permitted:
   1. Column location @ base plate: 1/2"
   2. Base Plate, bearing plate and column splice elevation: +1/8”
   3. Column Plumbness: in or out 3/8” in column length
   4. Beam elevation: +1/2”

C. The tolerances for Architecturally Exposed Structural Steel (AESS) must conform to 50% of the tolerances listed in Section B if not listed elsewhere in these Specifications or Contract Documents.

3.5 FIELD QUALITY CONTROL

A. The City of New York will engage the testing laboratory to perform the Special inspections. Cooperate with the Engineer for Special Inspection and the Testing Laboratory performing Special Inspection testing.

B. The Engineer for Special Inspection and the Testing Laboratory will review erection of structural framework and test field bolting and welding as listed in Part 2 of this Section. The engineer will also check the welding of deck and metal studs as described in Work Section 05 30 00.

C. Engage a Professional Engineer licensed in the State of New York to check tolerances and inspect the erection.

3.6 CLEANING

A. Structural steel or portions of such to receive sprayed fireproofing must be clean of dust, grease, oils, loose material, and any other matter which would impair the adhesion of the fireproofing material to the steel.

END OF SECTION 05 12 00

SECTION 05 30 00 - METAL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Furnishing material, labor, equipment, services necessary to erect all metal deck, including connections, welding and accessories required for installation of Work. Field cut and fit deck as required and cut all openings.
   2. Placing edge of deck at proper location to ensure proper placement of masonry. Set deck edge from a survey line based on the theoretical building line

B. Related Sections:
   1. Section 05 12 00 - Structural Steel Framing

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards will be deemed mandatory and applicable to the Work.

B. American Society Testing and Materials (ASTM) standards, latest editions.
   1. A36 - Standard Specification for Carbon Structural Steel.
   2. A108 - Standard Specification for Steel Bars, Carbon, Cold-finished, Standard Quality.
   3. A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   4. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coating.
   5. A992 - Standard Specification for Steel for Structural Shapes for Use in Building Framing.

C. American Institute of Steel Construction - AISC 360-05 Specification for Structural Steel Buildings

D. American Institute of Steel Construction - AISC 341-05 Seismic Provisions for Structural Steel Buildings, including Supplement no. 1 dated 2006.

E. American Iron and Steel Institute – AISI-NAS-01 North American Specification for the Design of Cold-Formed Steel Structural Members, including 2004 Supplement.

F. "Structural Welding Code - AWS D1.1" - American Welding Society (AWS).

G. "Specifications for Mild Steel Covered Arc - Welding Electrodes - AWS A5.1" - AWS.

H. "Design Manual for Floor Decks and Roof Decks" - Steel Deck Institute (SDI).

I. "Fire Resistance Directory" - Underwriters Laboratory (UL).

1.4 DESIGN REQUIREMENTS

A. Design of metal deck is governed by North American Specification for the Design of Cold-Formed Steel Structural Members, including the 2004 Supplement.

B. Metal deck unit sizes and gages are indicated on the Drawings. Metal deck must be minimum 40,000 psi and 18 gauge.

C. Units must span of three-span length except where framing layout does not permit. Should a two-span length be used provide deflection parameters in a letter from the manufacturer, indicating maximum deflection and shoring requirements. Contractor to assume responsibility of additional concrete required should deflection not be acceptable. Units must abut at end joints over beams requiring studs. Otherwise, end laps of deck sheets must be a minimum of 2".

D. Metal deck is designed to span 3 spans to achieve L/360. If not adhered to, check the possibility to require the use of shoring.

E. Use of integral and non-piercing hanger tabs to support ceiling systems are not permitted. Piercing hanger tabs with a safe working loading of 250 lbs. or greater are permitted for ceilings weights below the hanger tab capacity. Integral hanger tabs are to be used to assist with venting purposes only.

F. Units included in a fire rated assembly must be classified in appropriate UL designs.

G. The use of fasteners of equal or greater uplift capacity than welds for anchoring deck to steel for A, D, and G series assemblies is permitted in accordance with the UL Fire Resistance Directory.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data:
   1. Submit manufacturer's specifications for:
      a. Shear stud connectors
      b. Deck Fasteners, if used

C. Shop Drawings:
   1. Prepare metal deck shop drawings immediately after award of Contract.
   2. Shop drawings must include, but not be limited to the following:
      a. Type and gage of metal deck.
      b. Welding or fastener pattern.
      c. Side and end details of metal deck.
      d. Supplementary framing details.

e. Location of all openings and fittings.
f. Shop finish.
g. Size, location, and spacing of stud shear connectors, where required, for each beam.
h. Designation of welding electrode strength to be used.

3. Shop drawings reviewed by the Commissioner for general conformity with the Drawings will not relieve the Contractor or the metal deck supplier of responsibility for correctness of fit, quantities of materials, and adequacy of attachment details of deck and accessories to the structural steel. Deck must have UL Listing as part of the fire rated assembly. Approval of shop drawings does not absolve the Contractor of this requirement. Shop drawings must be submitted, sufficiently in advance of the start of the work to allow time for examination and review. No fabrication must be started prior to review of the drawings.
   a. Modification of details and all deviations from the design drawings, and the reasons, therefore, must be submitted for review with the shop drawings. Each modification or deviation must be brought to the Commissioner's attention.
   b. Responsibility for all errors in detailing, fabrication and fitting of the steel decking must be the Contractor's. Care must be taken to maintain all architectural clearances.
   c. Index sheets must be submitted with all deck details at time of submission. Where field welding is required, details must be submitted at the same time as corresponding shop drawings.
4. Calculations: Submit calculations for the load tables of the metal deck supplied. Calculations must be signed and sealed by a Professional Engineer licensed in the State of New York.

D. Quality Control Submittals:
1. Certificates:
   a. Submit notarized certificates from the manufacturers of the specified materials stating compliance with the applicable requirements set forth for all materials specified in this Section.
   b. Submit certificate stating welders employed for installation of the metal deck have met AWS qualifications within the previous 12 months.
   c. Furnish proof that deck to be used is part of an UL approved fire-rated assembly if other than deck shown on Drawings.
2. Manufacturers' Instructions: Furnish manufacturers' printed material, specifications and installation instructions for each type of decking, accessories, and studs.
3. Contractor Qualifications:
   a. Provide proof of Manufacturer and Erector qualifications specified under "Quality Assurance".

E. Surveys:
1. Submit signed and sealed copies of surveys conducted by a Licensed Land Surveyor showing locations of edge of deck with respect to theoretical edge of deck and building survey line. Indicate discrepancies between actual installation and Contract Documents. Surveys are to be submitted in a timely manner such that corrections can be made prior to placement of concrete.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Qualifications:
1. Manufacturer: Company specializing in the manufacture of metal deck as used in this Section must have a minimum of three (3) years' experience.

2. Erector: Company specializing in performing the Work of this Section must have a minimum of three (3) years' experience and have done projects with similar quantity of material.

C. Regulatory Requirements:
1. Building Code: Work of this Section must conform to all requirements of the 2014 Building Code of New York City and all applicable regulations of other governmental authorities. Where more severe requirements than those contained in the Building Code are given in this Specification, the requirements of this Specification will govern.
2. Industry Standards: Standards specified herein must apply to Work of this Section. Where more severe requirements then those contained in the standards are given in this section or the Building Code, requirements of this Section or the Building Code will govern.
   a. AISC 360-05 Specification for Structural Steel Buildings - As modified by the Building Code.
   b. AISC 341-05 Seismic Provisions for Structural Steel Buildings, including Supplement no. 1 dated 2006 - As modified by the Building Code.
   c. AISI-NAS01 North American Specification for the Design of Cold-Formed Steel Structural Members, including 2004 Supplement - As modified by the Building Code.
   d. Section 22 09 .2 of the Building Code of New York City.
   e. Fire Resistance Directory - UL.
3. Recommendations or suggestions in the codes and references listed in this Article and under "References" will be deemed to be mandatory unless they are in violation of the Building Code.

D. Certifications:
1. Structural metal deck and stud shear connectors must comply with Section 22 03 .1 of the Building Code of New York City. Materials must be readily identifiable for acceptance, certification and inspection requirements of Sections 2203.1 and 1704.4 of the Building Code of New York City.
2. Qualify welding processes and welding operators in accordance with AWS D1.1 Structural Welding Code – Steel.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver deck to site undamaged with each deck unit bearing the UL label and marking for specific system detailed.

B. Store deck units off the ground with one end elevated to provide drainage. Protect units from the elements with a waterproof covering.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Metal Deck and Accessories:
1. Vulcraft Company.
2. New Millennium Building Systems.
3. Canam US, Inc.
4. Or approved equal.

B. Stud Shear Connectors:
   1. KSM Products, Inc.
   2. Nelson Stud Welding Co.
   3. Albany County Fasteners.
   4. Or approved equal.

2.2 MATERIALS

A. Steel for Composite Metal Deck:
   1. Formed from galvanic steel sheets conforming to ASTM A653. Size of deck is to follow SDI requirements for thickness and tolerances.
   2. Minimum yield point of 40,000 psi.
   3. Formed with integral locking lugs.
   4. Formed with deformations to provide bond with concrete.
   5. Deck to receive sprayed fireproofing must be free of lubricants or oils that would impair the adhesion of the fireproofing material.
   6. Metal deck that is not exposed to view with architectural paint finish must have integral hanger tabs providing an approximate 0.5% uniformly distributed open area. The hanger tabs are used to assist with venting purposes only.

B. Steel for Roof Deck:
   1. Formed from galvanic steel sheets conforming to ASTM A653. Size of deck is to follow SDI requirements for thickness and tolerances.
   2. Minimum yield point of 40,000 psi.
   3. Deck to receive sprayed fireproofing must be free of lubricants or oils that would impair the adhesion of the fireproofing material.

C. Miscellaneous Steel Shapes:
   1. Conform to the requirements of ASTM A36 or A992. Members to receive sprayed fireproofing must be unprimed and free of lubricants or oils that would impair the adhesion of the fireproofing material.

D. Shop Finish:
   1. Metal deck: Steel sheet must receive before being formed a coating of zinc conforming to ASTM A653 coating class G60 (both sides). Metal deck exposed to view, must be cleaned and phosphatized prior to priming. Primer must be applied in the shop and is specified in Section 09 90 00 (Zinc dust-zinc oxide primer - 2.5 Mils DFT).
   2. Steel roof deck: Steel sheet must receive before being formed a coating of zinc conforming to ASTM A653 coating class G90 (both sides). Roof deck exposed to view, must be cleaned and phosphatized prior to priming. Primer must be applied in the shop and is specified in Section 09 90 00 (Zinc dust-zinc oxide primer - 2.5 Mils DFT).

E. Filler Metal for Welding:
   1. Welding electrodes must conform to E70XX classification of AWS A5.1. This includes all welding to properly fabricate and erect the steel decking.

F. Metal Deck Accessories (cants, pour stops, closure pieces, etc.):
   1. Deck accessories must conform to the requirements of ASTM A653, coating class G60. Unless a thicker gage is required by design considerations, such as at cantilever edge conditions, minimum

thickness must be same gage as metal deck. Accessories to receive sprayed fireproofing must be free of lubricants and oils that would impair the adhesion of the fireproofing material.

G. Headed Stud Type Shear Connector:
1. Headed stud must conform to the requirements of ASTM A108, Grade 1015 or 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B. Studs must be of uniform diameter, and heads must be concentric and normal to shaft. After welding, studs must be free from any substance or defects which would interfere with its function as a shear connector. Studs must remain unpainted and not galvanized.

H. Galvanizing Repair Paint:
1. Galvanizing repair paint must conform to the requirements of ASTM A780.

I. Deck Fasteners (if used):
1. Deck fasteners of a type that will provide equal or greater uplift resistance than a ¾" puddle weld.

J. Refer to the Notes on the Structural Drawings.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Do not begin placement of metal deck until all surfaces and members are deemed acceptable to receive the deck. If the supporting beams are not in proper alignment, or at proper level, Contractor must bring the matter (in writing) to the attention of the Commissioner for corrective action, and must see that the correction is made before finally placing steel deck units. Do not proceed with Work until any unsatisfactory conditions have been corrected to the satisfaction of the deck installer.

3.3 ERECTION

A. General:
1. Care should be taken to avoid overloading the supporting structural elements when placing bundles of metal deck or other construction loads on floors and roof.
2. Do not use floor deck units for storage or working platforms until they are permanently secured.
3. Employ a Professional Engineer licensed in the State of New York or Land Surveyor to ensure accurate erection of the deck and end closures.

B. Metal Deck and Accessories Installation:
1. Lay units in strict accordance with manufacturer's instructions and requirements and as shown on Drawings.
2. Adjust units in place before permanent fastening and accurately align end to end. Rectify inaccuracies in alignment and level of bearing before units are finally placed.

3. Provide proper bearing at all supports. Metal deck must be placed to bear fully on surface of beam flanges.
4. Provide angle and channel supports for metal deck at locations where deck cannot be properly seated due to obstructions by structural connections and as shown on Drawings. Coordinate with mechanical trades to adjust supports at columns if required to permit items to pass adjacent to column.
5. Anchor deck by welding directly through the bottom of the rib at all structural supports by welds not less than 3/4" in diameter or power driven fasteners of equivalent strength, spaced not more than 12" across the width of the unit. Where two units abut, each unit must be so fastened to the steel framing. Welds must be free of sharp points or edges.
6. Fasten side laps of adjacent units between supports by mechanically fastening with sheet metal screws of size and spacing required by manufacturer or as indicated on the Drawings to provide diaphragm strength required by seismic design. In no case must fasteners exceed two feet. Fasteners for exposed to view roof deck must be the minimum length possible to ensure an aesthetic appearance.
7. Furnish, install, and weld in position all accessories, including pour stops, closures, cant strips, etc., where required.
    a. Furnish sheet metal pour stops and closures for open ends of all cell raceways at columns, walls, and openings shown on Drawings. Pour stop gage is to be selected by manufacturer based on overhang. Revise gage if survey shows overhang exceeds that designed. Provide additional supports to strengthen pour stop at wedge inserts if required.
    b. Provide sheet steel cover plate (or closure tape) as required to close panel end conditions where panels change direction or abut.
    c. Furnish material for column closures to close openings between panels and structural columns.
    d. Provide welding hole cover, with friction fastening, to close welding access holes when required.
    e. Provide smooth form wood edge at locations where edge of deck will be exposed to view, such as at stairwells.
    f. Pour stops and closures along the perimeter of the building, around stairwells and around elevator shafts must be located from actual survey lines and must not be located via measurement from the perimeter beam locations.

C. Stud Shear Connector Welding:
1. Weld studs to steel beams through the steel deck with automatically-timed stud welding equipment.
2. Stud welding must conform to the requirements of AWS D1.1 with respect to workmanship, quality control, and field inspection.
3. Manufacturer must supply guidance and instruction in proper installation method.
4. Additional requirements for stud welding with metal deck:
    a. Top flanges of beams must be free of paint, heavy rust, millscale, dirt, ice and water, and any other material that will interfere with the welding operation.
    b. Metal deck must be free of dirt, ice, water, and other foreign materials that will interfere with the welding operation.
5. In addition to visual inspection, shop and field welded shear connectors will be tested and inspected according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
    a. 100% of stud flash welds must be visually inspected.
    b. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector. Bend must be in the direction away from the missing portion of flash weld.

c. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

d. Pre-production testing must be performed at beginning of each day or shift's production in accordance with AWS D1.1/D1.1M, section 7.7.1. A minimum of two (2) studs must be subject to bend test for each welder performing production welding. Any changes to the welding setup and/or if a new welder not part of the pre-production test will require retesting before continuing production welding.

D. Cutting, Drilling and Reinforcing of Openings:

1. Where predetermined openings (such as stairs, elevators, etc.) are framed by structural steel beams on all sides (shown on the Drawings), the metal deck must be engineered by the manufacturer to fit these conditions.
2. Any opening which is not framed by structural steel beams on all sides, and which is required in steel decking, must be cut by the respective trades requiring it. In all locations where support of the floor units has not been provided by the steel framing, furnish and install sufficient reinforcement and support the decking. Such support and reinforcing must meet the Commissioner's approval.
3. Reinforcing of Openings in Steel Deck:
   a. Holes 6" or less in dimension need not be reinforced.
   b. Holes greater than 6" but less than 30" in any dimension must be reinforced by the Contractor as shown on the Structural Drawings.

E. Field Touch Up:

1. Clean scarred and rusted areas in galvanizing after deck installation is completed and paint welds and the scarred and rusted areas with the galvanizing repair paint. Apply in accordance with the manufacturer's instructions.

F. Provide 2" wood planks or other adequate protection over areas of deck used for transporting materials.

G. Limit storing materials on deck to minimum. Take precautions to avoid concentrated loading; prevent damage to deck.

H. After erection of deck, if roof is not placed within ten days, deck surface must be protected from elements until roofing starts.

3.4 TOLERANCES

A. Edge of metal deck is to be within a tolerance of 1/4" of theoretical, set to a survey line, to ensure proper installation of masonry and installation of relieving angles, where required.

3.5 FIELD QUALITY CONTROL

A. Welding of metal deck and shear studs is subject to Controlled Inspection and Testing and is included as part of the Quality Control Work of Section 05 12 00.

B. Engage a Professional Engineer licensed in the State of New York to check tolerances and inspect the erection.

C. Testing and inspection of welding will be supervised by the Commissioner.

3.6 CLEANING

A. Metal deck and accessories to receive sprayed fireproofing must be clean of dust, grease, excessive oils, loose materials, and any other matter which would impair the adhesion of the fireproofing material to the deck and accessories.

B. Top of deck must be broom clean. Work is to be left in perfect condition for installation of built-up roofing, flashing and insulation, to the satisfaction of the subcontractor for that work. Work is to be corrected as required to the satisfaction of the Roofing subcontractor.

END OF SECTION 05 30 00

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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. Providing metal fabrications and miscellaneous metals as indicated on the Drawings and as specified herein, including, but not limited to the following:
      a. Support inserts
      b. Apparatus supports, miscellaneous hangers and accessories
      c. Ceiling Outlet Frames (For plaster ceilings only)
      d. Roof door frames
      e. Sill and stool supports
      f. Guard for kitchen vent flue
      g. Tee saddles
      h. Chimney connection frames
      i. Lintels (Exterior)
      j. Angle bases
      k. I-Beam, channel, angle, and other miscellaneous iron work
      l. Rooftop Equipment Service Access Platforms and Ladders
      m. Steel hangers, ladder racks, broom and mop racks, and floor brush racks, pipe and lumber racks, Custodian's workshop and supply room
      n. Miscellaneous bolts, anchors and inserts to be set in concrete
      o. Metal tread nosing on concrete steps and detectable warning surfaces at steps and ramps.

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards will be deemed mandatory and applicable to the Work.
   1. American Society for Testing and Materials (ASTM)
   2. American Welding Society (AWS).
   3. American National Standards Institute (ANSI)
   4. Society for Protective Coatings (SSPC)
   5. Federal Specifications (FS)
   6. National Association of Architectural Metals Manufacturers (NAAMM)
   7. Aluminum Association (AA)
   8. The Building Code of the City of New York, latest edition.
   9. The American Galvanizers Association

1.4 DESIGN REQUIREMENTS

A. Definitions in ASTM E985 for railing-related terms apply to this Section.

B. Structural Performance: Design, engineer, fabricate, and install the following metal fabrications to withstand not less than the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections as per Section BC 1607.7 of the 2014 NYC Building Code. Apply each load to produce the maximum stress in each respective component of each metal fabrication. In cases where local requirements are more stringent, they will apply. Where railings support fixtures or other imposed loads.
   1. Handrails:
      a. Uniform load of 50 lb/ft applied in any direction at the top and to transfer this load to the supports.
      b. Concentrated load of 200 pounds applied in any direction at any point and to transfer the load to the supports.
      c. The uniform and concentrated loads need not be assumed to act concurrently.
   2. Top Rail of Guardrail Systems:
      a. Uniform load of 50 lb/ft applied in any direction at the top and to transfer the load to the supports.
      b. Concentrated load of 200 pounds applied in any direction at any point and to transfer the load to the supports.
      c. The uniform and concentrated loads need not be assumed to act concurrently.
   3. Infill of Rail Systems: panels, balusters, intermediate railings, and other elements composing the infill area must resist the following combination loading. Reactions due to this combination loading are not required to be applied simultaneously with one another and are not required to be superimposed with those in paragraphs 1 and 2 above.
      a. A concentrated normal load of 50 pounds applied horizontally on an area of 1 ft^2, including openings and spaces between rails.
      b. A vertically downward load of 50 lb/ft applied at the most critical locations.
      c. A concentrated upward load of 50 pounds applied at the most critical location.
   4. Heavy Duty Metal Bar Gratings: Capable of withstanding a uniform load of 250 psf or a concentrated load of 8,000 pounds, whichever produces the greater stress. Provide heavy duty gratings except where light duty gratings are indicated.
   5. Light Duty Metal Bar Gratings: Capable of withstanding a uniform load of 75 psf, or a concentrated load of 2,000 pounds, whichever produces the greater stress.
   6. Elevator machine room grating: Capable of withstanding a concentrated load of 300 pounds on an area of 4 in^2.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data, for each item specified:
   1. Submit product data sheets for products used in metal fabrications, including anchoring devices. Instructions for installation of anchorage devices built into other work.
   2. Submit product data sheets for painting materials.
   3. Submit product data sheets for grouts and sealants.

C. Shop Drawings, for each item specified:
   1. Show all locations, markings, quantities, materials, sizes and shapes.
   2. Indicate all methods of connecting, anchoring, fastening, bracing and attaching to work of other trades.

D. Calculations:
   1. Where metal fabrications are required to comply with certain design loadings, submit structural design, structural calculations, materials properties, and other information needed for structural analysis, signed and sealed by the New York State licensed Professional Engineer responsible for their preparation.

E. Samples:
   1. Where specified, submit samples of fabricated items, hardware, and finishes for selection.

F. Welder certificates signed by the Contractor certifying that welders comply with requirements specified under Article titled "Quality Assurance".

G. Qualification data for firms and persons specified in Article titled "Quality Assurance" to demonstrate their capabilities and experience.
   1. Provide proof of Zinc Metallizer's qualifications specified under "Quality Assurance"; certification of qualifications meeting Military Standard by one of the following:
      a. A branch of the U.S. Dept. of Defense (DoD).
      b. A company certified by U.S. Dept. of Defense; submit DoD certification for this company.
      c. The Society for Protective Coatings (SSPC).
   2. Hot Dip Galvanizer/Powder Coating Applicator: Provide proof of Galvanizer/Applicator's qualifications by submittal of the following:
      a. Galvanizer's written Quality Control/Quality Assurance manual for hot dip galvanizing and factory applied coatings.
      b. Certification from the American Galvanizers Association that Galvanizer has completed all course requirements and is a certified Master Galvanizer.

H. Test Reports:
   1. Submit test reports for zinc metallizing or hot dip galvanizing and coating system as specified herein, paragraph titled "Galvanizing by the Zinc Metallizing Process; or Hot Dip Galvanizing; with Finish Coating".

I. Warranty:
   1. Warranty as specified herein.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Items provided in this Section must be manufactured and fabricated by firms experienced in the type of Work specified.

C. Installation must be by installers experienced in the type of Work specified for the respective item. Installer must be properly trained by the manufacturer.

D. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code – Steel", D1.3 "Structural Welding Code – Sheet Steel", and D1.2 "Structural Welding Code – Aluminum".
   1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

E. Engineer Qualifications: Professional Engineer licensed in the State of New York and experienced in providing engineering services of the kind indicated that have resulted in the successful installation of metal fabrications similar in material, design, and extent to that indicated for this project.

F. Zinc metallizer: The company or individual responsible for application of zinc metallizing must be certified as qualified to perform this process by one of the following:
   1. Certification in accordance with Mil Std 2138 or Mil Std 1687 by a branch of the U.S. Dept. of Defense, or by a company that is certified by the Dept. of Defense in accordance with either one of these military standards.
   2. Thermal Spray Certification by The Society for Protective Coatings (SSPC).
   3. The firm providing the zinc metallizing must also perform the painting of the members at the shop also to provide a single source responsibility.

G. Hot-Dip Galvanizer/Powder Coating Applicator: The company or individual responsible for application of hot dip galvanizing with a powder coat finish must be certified as qualified to perform this process by the following:
   1. Certification from the American Galvanizers Association that Galvanizer has completed all course requirements and is a certified Master Galvanizer.
   2. Certification from the manufacturer of the powder coatings that the galvanizer is an approved applicator of said manufacturer's material and meets all application and performance criteria.

1.7 PRODUCT HANDLING

A. Before shipment to the job, all finishes must be adequately protected for transporting and erecting periods.

B. Replace damaged items, with the approval of the Commissioner, and at no additional cost to the City of New York.

1.8 PROJECT CONDITIONS

A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress and work of other trades to avoid delay of work.

1.9 WARRANTY

A. Warranty for metal fabrication items with galvanizing by zinc metallizing or hot dip galvanizing, and finish coated with epoxy paint system or powder coat system: The manufacturer's warranty that items must not show signs of rust, and finish must be fully warranted against peeling, cracking, crazing, blistering, chalking and fading for a period of 5 years from date of Substantial Completion. If rusting or failure of coating occurs, new items must be provided or coating must be refurbished in the shop. Warranty includes labor to remove and replace the items.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Metals:
1. Metal Surfaces, General: For metal fabrications exposed to view upon completion of the Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.
2. Ferrous Metals:
   a. Steel Plates, Shapes, and Bars: ASTM A36
   b. Rolled Steel Floor Plates: ASTM A786
   c. Steel Bars for Gratings: ASTM A569 or ASTM A36
   d. Wire Rod for Grating Cross Bars: ASTM A510
   e. Cold-Formed Steel Tubing: ASTM A500
   f. Hot-formed Steel Tubing: ASTM A501
   g. Cold-Rolled Structural Steel Sheet: ASTM A611
   h. Hot-Rolled Structural Steel Sheet: ASTM A570
   i. Cold-Rolled Steel Sheet: ASTM A366
   j. Galvanized Structural Steel Sheet: ASTM A446
   k. Galvanized Commercial Quality Steel Sheet: ASTM A526
   l. Steel Pipe: ASTM A53; finish, type, and weight class as follows:
      1) Black finish, unless otherwise indicated.
      2) Galvanized finish for exterior installations and where indicated.
      3) Type S, Grade A, standard weight (schedule 40), unless otherwise indicated, or another grade or weight or both required by structural loads.
   m. Gray Iron Castings: ASTM A48, Class 30
   n. Malleable Iron Castings: ASTM A47, Grade 32510
   o. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
   p. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A47, or cast steel, ASTM A27. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A153.
      1) "Peerless Wedge", Manufactured by "Peerless Hardware Manufacturing Co., Inc.
      2) Hohmann & Barnard
      3) Unistrut
      4) Or approved equal
   q. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for the metal alloy to be welded.
   r. Stainless Steel bar: ASTM A276, Type 304
   s. Stainless Steel plate: ASTM A240, Type 3
3. Aluminum:
   a. Extruded Bars and Shapes: ASTM B221, alloy as follows:
      1) 6061-T6 or 6063-T6 for bearing bars of gratings and shapes.
      2) 6061-T1 for grating cross bars.
   b. Aluminum–Alloy Rolled Tread Plate: ASTM B632, alloys as follows:

1) 6061-T6 for platforms.
2) 6061-T4 for treads.

c. Aluminum Sheet for Expanded Aluminum Grating: ASTM B209, alloy 5052-H32.

d. Fasteners for Aluminum Gratings: Use fasteners made of same basic metal as fastened metal except use galvanized fasteners complying with ASTM A153 for exterior aluminum units, unless otherwise indicated. Do not use metals that are corrosive or incompatible with metals joined.

4. Bronze:

a. Detectable Warnings: 1/4" thick, with integral cast anchors, cast-in abrasive and raised truncated domes conforming to requirements of Americans with Disabilities Act.

1) Safe-T-Metal Co., BRAVO Bronze, FONDREMY INC. or approved equal.

B. Grout and Anchoring Cement:

1. Nonshrink Metallic Grout: Premixed, factory-packaged, ferrous aggregate grout complying with Federal Specification CE CRD-C 621 specifically recommended by manufacturer for heavy-duty loading applications of type specified in this section.
2. Nonshrink Nonmetalic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, non-gaseous grout complying with Federal Specification CE CRD-C 621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
3. Erosion-Resistant Anchoring Cement: Factory-prepackaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without need for protection by a sealer or waterproof coating and is recommended for exterior use by manufacturer.
4. Products: Subject to compliance with requirements, provide one of the following:

a. Nonshrink Metallic Grouts:

1) “Hi Mod Grout”, Euclid Chemical Co.
2) “Embeco 885 and 636”, Master Builders
3) “Ferrolith G Red-Mix and G-NC”, Sonneborn Building Products Div., Rexnord Chemical
4) Or approved equal

b. Nonshrink Nonmetallic Grouts:

1) “Euco N-S Grout”, Euclid Chemical Co.
2) “Crystex”, L & M Construction Chemicals, Inc.
3) “Masterflow 713”, Master Builders
4) “Sonogrout”, Sonneborn Building Products Div., Rexnord Chemical Products, Inc.
5) “Five Star Grout”, U.S. Grout Corp.
6) Or approved equal

c. Erosion-Resistant Anchoring Cement:

1) “Super Por-Rok”, Miniwax Construction Products Division
2) Sakrete Anchor Cement
3) Quickrete Anchoring Cement
4) Or approved equal

C. Fasteners:

1. General: Provide galvanized or type 304/316 SS fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.
2. Bolts and Nuts: Regular hexagon head type, ASTM A307, Grade A
3. Lag Bolts: Square head type, ANSI B18.2.1

4. Machine Screws: Cadmium plated steel, FS FF-S-92C
5. Drilled-In Expansion Anchors: Anchors installed in concrete must have current ICC-ES listing for performance in cracked concrete as per Section BC 1912.
6. Toggle Bolts: Tumble-wing type, type, class, and style as required.
7. Lock Washers: Helical spring type carbon steel, FS FF-W-84A
8. Vandal resistant fasteners: Torx with pin, or as otherwise indicated. Corrosion resistant.

D. Paint:
1. Shop Primer, interior Work: Acrylic rust-inhibitive type containing no lead equal to Tnemec 115 Unibond, Carboline Carbocrylic 3358, Benjamin Moore M04 or approved equal. Paint must meet EPA standards for VOC emissions.
2. Shop Primer, exterior Work except galvanized items: primer for epoxy coat system as specified in Section 09 90 00.
3. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 except containing no asbestos fibers.

E. Galvanizing by the Hot-dip Method – No Finish Coating:
1. Items indicated to be painted must not be hot-dip galvanized except as specified herein.
   a. Galvanize structural shapes in accordance with ASTM 123.
   b. Galvanize hardware in accordance with ASTM A153.
   c. Galvanizing repair paint for regalvanizing welds and damaged areas must conform to ASTM A780 such as ZRC Cold Galvanizing Compound, GRAINGER Cold Galvanizing Compound, CRC Cold Galvanizing Compound or approved equal.

F. Galvanizing by the Zinc Metallizing Process or Hot Dip Galvanizing; and Finish Coating:
1. Zinc/aluminum metallizing (referred to herein as zinc metallizing) is the process of thermally applying an 85/15 zinc-aluminum wire over the surface of steel.
2. Zinc metallizing or hot dip galvanizing, and finish coating system must have the following performance characteristics and results of tests performed on representative samples. Finish coating for metallizing must be either epoxy coating system or powder coating. Finish coating for hot dip galvanizing must be powder coating (See paragraph 3 below for acceptable system):
   a. Adhesion: Test zinc metallizing/hot dip galvanizing with complete finish coating (epoxy coating system or powder coating system) in accordance with ASTM D4541, Test Method E. Pull-off strength throughout the system must be not less than 750 psi before and after environmental cycling.
   b. Environmental cycling must be 10 cycles of the following: 4 hrs at 100% humidity per ASTM D1735; 16 hours below 0°F; and 4 hours at 140ºF.
   c. Corrosion resistance of zinc metallizing/hot dip galvanizing with epoxy coat system or powder coating: A rating of 10 after 1000 hours salt fog (prohesion method) when tested in accordance with ASTM D1654, Procedure A. Scribe must be cut through all coatings to bare steel substrate. Expose specimens in accordance with ASTM G85.
   d. Powder coating complying with the following ASTM standards:
      1) Adhesion: ASTM D3359, no loss.
      2) Hardness: ASTM D3363 (pencil), H min.
      3) Falling Sand: ASTM D968 20L/mil.
      4) Salt Spray: ASTM B117, passes 3000 hrs.
      5) Humidity: ASTM D2247, 3000 hours, few #8 blisters.
      6) Impact Resistance (3mm): ASTM D2794, no loss.

7) Color Retention: ASTM D2244, 5 year less than or equal to 5 delta E.
8) Chalk Resistance: ASTM D4214, #8 rating.
9) Gloss Retention: ASTM D523, greater than or equal to 30 percent retention.
10) Erosion Resistance: ASTM B244, less than 10 percent film loss.
11) Compliance: AAMA 2604.

3. Hot Dip Galvanizing with Powder Coating Finish:
   a. As a system equivalent to zinc metallizing, it is permitted to use the Duncan Colorgalv Thermoset process of hot dip galvanizing with powder coat finish. Galvanizing coating thickness grade per ASTM A123 must be 100, with DFT mil thickness coating not less than 3.6 to 3.9 mils.
   b. Powder coating thickness must be as specified in this specification. Coating must include an architectural grade primer.
4. Galvanizing repair paint for regalvanizing welds and damaged areas must conform to ASTM A780 such as ZRC Cold Galvanizing Compound, GRAINGER Cold Galvanizing Compound, CRC Cold Galvanizing Compound or approved equal.

2.2 FINISHES

A. General:
1. Comply with NAAM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
2. Finish metal fabrications after assembly.
3. Refer to Articles 2.4 and 2.5 for painting and galvanizing.

B. Aluminum Finishes:
1. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.
   a. As Fabricated Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).
   b. Class 1 Clear Anodized Finish: AA-M12C22A41 (Mechanical Finish: as fabricated, nonspecular; Chemical Finish: etched, medium matte; Anodic Coating: Class I Architectural: clear film thicker than 0.7 mil) complying with AAMA 607.1.

2.3 FABRICATIONS

A. General:
1. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
3. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.
   a. Temperature Change (Range): 180°F
4. Shear and punch metals cleanly and accurately. Remove burrs.

5. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
6. Remove sharp or rough areas on exposed traffic surfaces.
7. Weld corners and seams continuously to comply with AWS recommendations and the following:
   a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   b. Obtain fusion without undercut or overlap.
   c. Remove welding flux immediately.
   d. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.
8. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flathead (countersunk) screws or bolts. Locate joints where least conspicuous.
9. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
10. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
11. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware, screws, and similar items.
12. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

B. Support Inserts:
   1. Provide "Peerless Wedge" hot-dip galvanized inserts for anchorage to concrete at locations shown on the Drawings, or as required. Wedge inserts must be provided with a 3/4" bolt, nut, and washers, all hot-dip galvanized. Install 3/4" diameter reinforcing bar X 1'-6" minimum length through anchor loop to increase anchorage in concrete. Space inserts 2'-6" on centers (maximum) starting 6" from face of masonry opening. Submit three (3) samples for approval. Shims must be square horseshoe shape, hot-dip galvanized, as indicated on the Drawings.

C. Apparatus Supports, Miscellaneous Hangers and Accessories:
   1. Provide bolts, stud bolts, for all bolts and fasteners for the support of apparatus and other items as indicated on the Drawings. Secure to steel beams or concrete floor slabs above. Where exposed to view in interior, provide finish paint in addition to shop paint.

D. Ceiling Outlet Frames (For Plaster Ceilings Only):
   1. When ceiling outlet frames for air diffusers are furnished under Division 23, they must be installed under this Section.
   2. When ceiling outlet frames for recessed electrical fixtures are furnished under Division 26, they must be installed under this Section.
   3. Provide shop and finish paint.

E. Roof Door Frames:
   1. Provide angle-iron frames for doors to bulkheads on roofs, with anchor straps to be built into the masonry. Members must be galvanized and finish painted.

F. Sill and Stool Supports:
1. Furnish grilles in sill or stools of windows where indicated on the Drawings. Furnish to the mason at the proper time, all continuous angles and tees, angle brackets, anchor straps, and other items required for the support of the sills or stools and the grilles. Furnish angles, tees, steel plate, and other items required for support of masonry, tiles, and other sills where indicated on the Drawings. Provide shop and finish paint.

G. Tee Saddles:
1. Provide saddles of 2¼" x 2¼" x 1/4" tee-iron, where indicated on the Drawings. Secure in place. Provide shop and finish paint.

H. Lintels (Exterior):
1. Furnish to mason at the proper time for setting all steel lintels in exterior walls not connected (by hangers, clips, bolts, or otherwise) to the structural work. Lintels in exterior walls of reinforced concrete framed superstructure or portion thereof, or in the concrete fire proofing of steel spandrel beams must be secured in place by means of wedge inserts in concrete beams or steel spandrel fireproofing.
2. All exterior lintels in exterior walls must be galvanized. Bolts connecting lintels to the galvanized wedge inserts must be galvanized in accordance with ASTM A153. Lintels exposed to view must also be finish painted as specified herein with powder coating or epoxy coating system.

I. I-Beam, Channel, Angle, T-Framing, and Miscellaneous Iron Work:
1. All ferrous metal items described in this paragraph must be galvanized if located in kitchen areas, in exterior wall or roof construction, or if exposed to the exterior. Where exposed to view, also provide finish paint as specified herein - powder coating or epoxy coating system. Interior items must receive shop and finish paint.
    a. Provide all I-beams, channels, angles, T's, bent plates, steel plates, bent angle frames and all other miscellaneous iron work as indicated on the Drawings, except framing forming a part of the structural steel work. Drill all holes required to secure metal, wood and other materials to the framing.
    b. Where indicated on the Drawings, provide framing and stiffening for low partitions; channel framing, hangers, and other items.
    c. Furnish all steel plates, straps, stiffeners, ties, complete with bolts, washers, and all other items needed for a complete installation, for exterior wood windows. Furnish to the installer in time for its incorporation into the Work.
    d. Provide 12 gage channel and 3" x 3" x 1/4" angle frame, or other members indicated on the Drawings, where ducts pass through fire zone partitions.
    e. Provide angle lintels of sizes required at openings for outside air intake chambers.
    f. Furnish all necessary steel plates, bolts, hangers, and other items needed for a complete installation. All bolts must be in place before fireproofing.
        1) Bolts required where folding partitions are supported from structural steel must be furnished and welded in place as part of the Work of this Section. Use bolt spacing templates furnished by partition manufacturer.
    g. Provide 4" x 4" x 3/8" angle frame, or other members indicated on the Drawings.
    h. Provide steel supports for counters and cabinets where shown on the Drawings.
    i. Provide all clip angles required for anchoring wood blocking at gravel stops. Secure clip angles, of sizes and spacing indicated on the Drawings, to concrete with threaded bolts; furnish

bolts at proper time for setting in concrete. Drill clips to receive bolts for anchoring wood blocking in place.

j. Provide angle frame and shelf angle support for subway type grating as indicated on the Drawings.

k. Weather Bars for Wood Sills:

1) Furnish to the wood window installer for all wood window and louver sills, aluminum 1/8" x 1" bars full length of wood window and louver sills. See Drawing Details.

2.4 PAINTING

A. All miscellaneous ferrous metal work, except those members to be galvanized, must be given one shop coat of paint before leaving the shop. For those items to be zinc metallized or hot dip galvanized and finish painted, apply coatings in the shop as specified herein.

B. Cleaning and Surface Preparation:

1. Clean all steel first in accordance with SSPC-SP1.
2. Clean steelwork not to be painted (except steel work to be galvanized) in accordance with SSPC-SP2.
3. Clean steelwork to be painted within the same day as it will be applied and in accordance with the following methods, determined by location and exposure:
   a. Interior steel not exposed to view: SSPC-SP2
   b. Interior steel exposed to view: SSPC-SP3
   c. Cavity wall and exterior steel exposed to weather: SSPC-SP6

C. Shop Coat:

1. Apply steel primer paint (general application) at a rate to provide dry film thickness of 2.0 to 3.5 mils. Apply primer paint (cavity wall and exterior application) at a rate to provide dry film thickness of 4.0 to 6.0 mils. Provide full coverage of joints, corners, edges, and exposed surfaces.
2. Apply to dry surfaces only, when surface temperatures are above dew-point, by brush, spray, or roller, thoroughly and evenly, in strict accord with manufacturer's instructions for every detail of handling.
3. Apply second coat of the approved primer, in a darker shade, to surfaces inaccessible to painting after assembly or erection.
4. Protect machined surfaces with an approved rust-inhibiting coating that is readily removable prior to erection.

2.5 GALVANIZING AND FINISH COATING

A. General: Galvanize the following Work (items that are to be finish painted must be galvanized by the zinc metallizing process or hot dip galvanized, and finish coated as specified herein):

1. All angles and other steel items located in exterior wall or roof construction
2. All angles supporting exterior masonry or exposed to the weather.
3. All steel members and fabrications exposed to the exterior.
4. All other steel members and fabrications indicated as galvanized on the Drawings and Specifications.

B. Zinc Metallizing-Finish Coating Applicators:

1. Atlantic Coast Metallizing & Coatings Corp., Melville, NY
2. Avant Guards Manufacturing, Brooklyn, NY
3. East Coast Metallizing & Coating Systems Inc., Westbury, NY

4. Island Wide Sandblasting Inc., Wyandanch, NY
5. Reneuxit LLC, West Chester, PA
6. Or approved equal

C. Hot Dip Galvanizing with Powder Coating Finish:
1. Duncan Galvanizing Corp, Everett, MA
2. Wagner, Milwaukee, WI
3. US Steel Corporation, Pittsburgh, PA
4. Or approved equal

D. Powder Coating Materials:
1. Tiger Drylac, Ontario, California; Series 38 Super Durable Powder Coating.
2. PPG Industries, Pittsburgh, PA; Coraflon Ultradurable Powder Coating.
3. The Sherwin-Williams Co., Cleveland, OH; Powdura Super Durable Powder Coatings Series.
4. Or approved equal

E. Cleaning and Surface Preparation:
1. Hardware (bolts, nuts, etc.): Clean and leave free of mill scale before galvanizing.
2. Clean all steel first in accordance with SSPC-SP1 if needed.
3. Steel members: Clean in accordance with SSPC-SP8 before hot-dip galvanizing.
4. Steel members: Clean in accordance with SSPC-SP10 before zinc metallizing. Surface must have a 3-4 mil anchor pattern. Moisture cannot be present on steel and temperature cannot be less than 5ºF above the dew point. Thermal spray must be applied within 4 hours of blasting.

F. Shop Coat - Hot-dip Galvanizing – as required for galvanized items not indicated to receive finish paint coat.
1. Galvanize hardware in accordance with ASTM A153.
2. Galvanize steel shapes in accordance with ASTM A123. Apply zinc coating as per Thickness Grade specified in ASTM A123.

G. Shop Coat – Galvanizing by the Zinc Metallizing Process – Provide for all galvanized items indicated to receive finish paint, which includes all galvanized items exposed to public view, including lintels, and other items shown on Drawings or specified herein under section 1.2 (description of work). Finish paint must be the epoxy coat system or the powder coat system; producing a smooth, uniform surface, free of bubbles, runs, or sags. Hot Dip Galvanizing with powder coat finish is also permitted as specified in Paragraph H below.
1. Thermally spray metallizing material at a rate of 4.0 to 6.0 mils DFT. Sprayed coating must be free of lumps, blisters, and loosely adhering particles. Coating must be capable of passing the inspection requirements of Mil Std 2138A (SH) of 5/13/92, but with adhesion 750 psi minimum per ASTM D4541, Test Method E.
2. Epoxy Coating System, as specified in Section 09 90 00: After the metallizing material has cured, apply a first coat of paint at a rate of 4.0 to 6.0 mils DFT, Polyamide Epoxy Paint such as Tnemec Series 27 FC Typoxy, Nova Tuff Polyamide Epoxy, Benjamin Moore Polymide Epoxy or approved equal. Top coat must be Acrylic Aliphatic Polyurethane such as Tnemec Series 73 Endura-Shield, Rust-oleum 3300, Corotech Aliphatic Acrylic Urethane systems or approved equal, applied at a rate of 2.0 to 3.0 Mils DFT.
3. Powder Coating System: After the metallizing material has cured, properly prepare the item and apply Tiger Drylac Series 38 Super Durable Powder Coating, PPG Industries Coraflon Ultradurable

Powder Coating, Sherwin-Williams Powdura Super Durable Powder Coatings Series system or approved equal.

a. Oven bake item for 20 minutes at 450°F and remove all oil and grease. Cool surface to 72°F, clean with an organic solvent. Apply paint within 3 hours of final cleaning.
b. Apply an out-gas-forgiving primer at the rate of 2-3 mils DFT. Oven cure material at 400°F for 10 minutes.
c. In order to avoid oxidation, final topcoat must be applied within 12 hours.
d. Apply a lead-free TGIC polyester powder topcoat finish at a rate of 4.0 to 5.0 mils DFT.
e. Oven cure at 400°F to 450°F, for 30 minutes, or as recommended by coating manufacturer.

H. Hot Dip Galvanizing with Powder Coating Finish: As a system equivalent to zinc metallizing, it is permitted to use the Duncan Colorgalv Thermoset process, PowderGALV, Fortress Fusion process of hot dip galvanizing with powder coat finish or approved equal. Galvanizing coating thickness grade per ASTM A123 must be 100, with DFT mil thickness coating not less than 3.6 to 3.9 mils

1. Comply with ASTM A123 for fabricated products and ASTM A153 for hardware, with zinc coating thicknesses not less than those specified in the specification, 3.6 to 3.9 mils DFT.
2. Fill vent holes after galvanizing, if applicable, and grind smooth.
3. Galvanizing must exhibit a rugosity (smoothness) 4 rug or less (16-20 microns of variation) when measured by a profilometer over a 1-inch straight line on the surface of elements that are less than 24 pounds per running foot. Profilometer must be capable of operating in 1 micron increments.
4. The incoming material must be inspected, material hung on a rack or chain to be galvanized.
5. Material submerged into caustic cleaner removing the organics from the surface and rinsed with water.
6. Material pickled with hydraulic acid removing iron oxides from the surface and rinsed with water.
7. Material submerged into a flux removing any oxides that have formed after pickling and protecting the material from further formation of additional oxides before being galvanized.
8. The material submerged into Zinc bath at 850°F.
9. The material must be allowed to naturally cool and not quenched with water or chemicals.
10. The galvanizing must be inspected and pre-finished, removing edge tears, spikes, drips, or sharp protrusions which could cause potential harm to someone handling or using the material.
11. The Galvanized material must be abraded to create a 1-1.5 mil profile for surface preparation. The profile must be produced by abrasive blasting and or hand abrading.
12. The galvanized material must be inspected prior to powder coating to determine conformance of the material to ASTM A123 and the specifications for quality and thickness of zinc coating, not less than 3.6 to 3.9 mils DFT.
13. The galvanized surface profile must be measured at 1-1.5 mils and recorded utilizing Press-O-Film tape.
14. All galvanized material must be outgassed after profiling and before powder coat application.
15. A coating inspection form must be filled out completely with material information, application conditions, and quality standards.
16. All powder coating products must be electrostatically applied following the recommendations of the powder supplier and the requirements of the powder coating Manufacturers Technical Data Sheet, and with Dry Film Thickness not less than is specified in the specifications.
17. The first coat must consist of an Epoxy Primer powder applied at not less than 2.0 – 3.0 mils Dry Film Thickness. The powder must be heated to 400°F to provide adhesion with the next coat of powder, and in accordance with the manufacturer's recommendations.
18. The next coat of powder to be applied must be Sherwin Williams Powdura Super Durable, Tiger Drylac Series 38 Super Durable, PPG Industries Coraflon Ultradurable Powder coating systems or

approved equal applied at a dry film thickness of not less than 4.0-5.0 mils. The surface of the fabrications after applying the powder must be heated to 400°F for at least 10 minutes to cure the powder and in accordance with the manufacturer's recommendations. The color of the powder must match the approved color sample that will be approved by the Commissioner.

19. All repairs of galvanizing must follow ASTM A780.
20. All repairs to powder coating must be sanded and feathered with the surrounding area. The damaged area must be cleaned and abraded to receive a powder or liquid coating. The liquid coating can be applied using either a spray or brush method.
21. Apply powder coating system within time frame after galvanizing as part of the PowderGALV, Fortress Fusion process and Duncan Colorgalv process or approved equal, to ensure oxides will not form and the process will be complete.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSPECTION

A. Make all required measurements in the field to ensure proper and adequate fit.

3.3 DISCREPANCIES

A. Immediately notify the Commissioner.

B. Do not proceed until fully corrected.

3.4 ERECTION / INSTALLATION

A. Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
   1. Provide inserts, setting plates, and other items of concealed work required for attachment of metal fabrications in a timely manner to facilitate on-going construction.

B. Perform cutting, drilling, and fitting required for installation of metal fabrications. Set work accurately in location, alignment, and elevation, plumb, level, true, and free of rack, measured from established lines and levels. Do not weld, cut, or abrade surfaces of metal fabrications that have been coated or finished after fabrication and are intended for field connection by mechanical means without further cutting or fitting.

C. Fit exposed connections accurately together to form tight, hairline or, where indicated, with uniform reveals and spaces for sealants and joint fillers.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.

E. Install concealed gaskets, joint fillers, insulation and flashings as the work progresses, so as to make work weathertight, soundproof or lightproof as required.

F. Restore protective coverings that have been damaged during shipment or installation of the work. Remove protective coverings only when there is no possibility of damage from other work yet to be performed at the same location.

G. Field Welding: Comply with applicable AWS specification for procedures of manual shielded metal-arc welding, for appearance and quality of welds made, and for methods used in correcting welding work. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed welded joints smooth and restore finish to match finish of adjacent surfaces.

H. Corrosion Protection: Coat concealed surfaces of aluminum and steel which will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

I. Adjust metal fabrications prior to anchoring to ensure matching alignment at abutting joints.

J. Install items as detailed in the drawings; for manufactured items, install as recommended by the Manufacturer, unless indicated otherwise.

K. Coordinate with other trades involved.

L. Install detectable warning surfacing in manner for top surface to align with adjacent finish flooring surface (or slab surface for finished exposed concrete).

M. Field Touch-Up:
   1. Painted Members: After erection, clean all damaged areas in shop coat, exposed surfaces of bolts, bolt heads, nuts and washers, abrasions, and all field welds and unpainted areas adjacent to field welds to the same standards as the shop coat and paint with primer paint to same thickness as the shop coat. Finish painting is specified in Section 09 90 00.
   2. Galvanized Members: After erection, clean and paint all damaged areas to the galvanizing, welds, and areas adjacent to welds with the galvanizing repair paint complying to ASTM A780. For galvanized members to be painted, finish painting must be the final two coats of the epoxy coating system. For powder coating system follow instructions of the powder coat manufacturer, to match surrounding undamaged areas.

3.5 PROTECTION

A. Protect finishes of metal work from damage during construction period by use of temporary protective coverings approved by ornamental metal manufacturer. Remove protective covering at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so that no evidence remains of correction work. Return items which cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

END OF SECTION 05 50 00

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SECTION 07 52 00 - ROOF FLASHING AND RELATED ROOF REPAIR 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. Section includes:
   1. Minor modifications and repairs to an existing roof system including but not limited to pipe and duct penetrations, minor roof membrane repairs and installation of equipment curbs and rails.
   2. The furnishing and installation of the following items:
      a. Premanufactured Metal Curbs
      b. Pitch Pockets
      c. Lead Flashing (Drains)
      d. Cants
      e. Roof membranes and flashings
      f. Gravel, Crushed Stone
      g. Protection Pads
      h. Premanufactured equipment rails
      i. Premanufactured pipe portals

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards will be deemed mandatory and applicable to the Work.
   1. American Society for Testing and Materials (ASTM).
   2. Underwriters Laboratories, Inc. (UL).
   3. National Roofing Contractors Association (NRCA).
   4. Thermal Insulation Manufacturers Association (TIMA).
   5. Federal Specifications (FS)
   6. Factory Mutual System (FMS)
   7. United States Environmental Protection Agency (EPA)

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Catalog sheets, specifications, and installation instructions, for each material specified or shown on drawing, except for the following:
   1. Cants.

2. Wood nailers.
3. Gravel/crushed stone.

C. Shop Drawings:
1. Shop drawing showing the intended repair detail assembly including curb supports, penetration details, if any.

D. Quality Control Submittals:
1. Test Reports:
a. Roof drain and leader test, if affected by work.
b. Roof deck fastener pullout test, if applicable.
c. Daily bitumen temperature charts.
d. Roof flood test at each repair/modification area.

E. Contract Closeout Submittals:
1. Contractor's 2-year guarantee.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Temporary Watertightness:
1. Penetrations:
a. Contractor must install temporary sealant or shielding to prevent ingress of water through penetrations of new equipment.

C. Fire Department Regulations:
1. Equipment and fuel must meet the requirements of the New York City Fire Department. Hot roof kettles may not be placed on the roof.

D. Pre-Installation Conference:
1. Before the roofing Work is scheduled to commence, a conference will be called by the Commissioner at the site for the purpose of reviewing the Drawings and the Specifications and discussing requirements for the Work. The conference must be attended by the Contractor and the roofing applicator.

E. Company Field Advisor:
1. Secure the services of a Company Field Advisor of the membrane manufacturer for a minimum of 4 working hours. The Field Advisor must be present at the Pre-Installation Conference and at the beginning of the actual membrane installation for the purpose of:
a. Rendering technical assistance to the Contractor regarding installation procedures of the system.
b. Familiarizing the Commissioner with all aspects of the system including inspection techniques.
c. Answering all questions which might arise.

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials to the site in the manufacturer's labeled, unbroken containers.

B. Storage and Handling: Store materials in a dry, well ventilated place protected from the weather.
   1. Volatile liquids must be stored in a separate storage building or trailer, or removed from the Site at the end of each workday.
   2. Store volatile liquids at temperatures recommended by the manufacturer.
   3. Store adhesives at temperatures between 60°F and 80°F.

1.7 PROJECT CONDITIONS

A. Do not execute the Work of this section unless the Commissioner is present, or unless the Commissioner directs that the Work be performed during the Commissioner's absence.

B. Temperature: Do not apply built-up roofing when the deck or air temperature is below 40°F.

C. Do not execute the Work of this Section unless the substrate is dry, and free from debris and dust.

D. Moisture Protection
   1. Cover, seal or otherwise protect the roof and flashings so that water cannot accumulate or flow under completed portions. When and where necessary to accomplish this, provide temporary water cut-offs in accordance with the membrane manufacturer's written specifications.
   2. Limit the removal of existing materials to areas that can be completely re-roofed or temporarily protected within the same day.

1.8 GUARANTEE

A. Contractor's Guarantee: Two-year written guarantee covering defects in materials and/or workmanship. Also includes repair to all ancillary areas damaged due to leaks.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Asphalt Primer and Asphalt:
   1. GAF Building Materials Corp., Wayne, NJ
   2. Johns Manville, Denver, CO
   3. CertainTeed Corporation, Valley Forge, PA
   4. Trumbull/Owens Corning, Toledo, OH
   5. Or approved equal

B. Primer for Cold Repair System:
   1. Johns Manville PermaFlash Primer
   2. GAF Hydrostop
   3. Certainteed SmartFlash One
   4. Firestone UltraFlash
   5. Or approved equal

C. Base Sheet:
   1. GAF GAFGLAS #75 Base sheet

2. Johns Manville GlasBase
3. CertainTeed Glasbase Base Shee
4. Firestone MB Base M
5. Or approved equal

D. Vent Base Sheet:
1. GAF GAFGLAS Stratavent Eliminator Base Sheet
2. Johns Manville Ventsulation
3. CertainTeed Channel Vent Base Sheet
4. Firestone Venting Base
5. Or approved equal

E. Ply Sheets, Vapor Barrier and Cover Strip:
1. GAF GAFGLAS FlexPly 6
2. Johns Manville GlasPly Premier
3. CertainTeed FlintGlas Premium Ply Sheet Type VI
4. Firestone Ply VI M.
5. Or approved equal

F. Granule Surfaced Modified Bitumen Roofing Membrane Cap Sheet:
1. White cap sheet:
    a. GAF Ruberoid EnergyCap SBS 30 FR
    b. Johns Manville Dynaglas FR CR
    c. CertainTeed Flintlastic FR-P CoolStar
    d. Or approved equal

G. Modified Bitumen Base Sheet:
1. Johns Manville DynaBase Base sheet.
2. GAF Liberty / Ruberoid 20 Base sheet
3. Certainteed Flintlastic Poly SMS Base sheet
4. Or approved equal

H. Insulation:
1. Composite Insulation Board:
    a. GAF EnergyGuard Composite Board Insulation
    b. Johns Manville Fesco Foam Polyisocyanurate
    c. AC Foam II with 1/2" perlite on top, by Atlas Energy Products, Atlanta, GA.
    d. CertainTeed Flintboard Iso Plus Composite
    e. Firestone ISO 95+ Composite
    f. Or approved equal
2. Isocyanurate Insulation Board:
    a. EnergyGuard PolyiIso Insulation by GAF.
    b. ENRGY 3 Polyisocyanurate by Johns Manville.
    c. AC Foam II by Atlas Energy Products, Atlanta GA.
    d. CertainTeed Flintboard Iso
    e. Firestone ISO 95+ GL
    f. Or approved equal

3. Top Layer of Three Layer System
    a. 1/2" High-density fiberboard or EnergyGuard Perlite by GAF.
    b. 1/2" Retro-fit Board by Johns Manville.
    c. 1/2" Perlite Board by Atlas.
    d. 1/2" FiberTop by Firestone.
    e. Or approved equal

I. Base Flashing:
1. Two base plies:
    a. GAF GAFGLAS FlexPly 6.
    b. Johns Manville GLasPly Premier.
    c. CertainTeed FlintGlas Premium Ply Type VI.
    d. Firestone Ply VI M.
    e. Or approved equal
2. One ply cap sheet:
    a. GAF Ruberoid EnergyCap SBS 30 FR.
    b. Johns Manville Dynaflex CR.
    c. CertainTeed Flintlastic FR-P CoolStar.
    d. Firestone SBS Premium
    e. Or approved equal

J. Liquid flashing system for curb flashing and penetrations:
1. Johns Manville, PermaFlash penetration flashing and low flashing system.
2. GAF MajorSeal Liquid Flashing
3. CertainTeed SmartFlash One
4. Firestone UltraFlash One-Part liquid flashing
5. Or approved equal

K. Two component, solvent free, elastomeric, cold application adhesive for repairs:
1. Johns Manville, Bonding Adhesive
2. GAF MajorSeal Liquid Flashing
3. CertainTeed SmartFlash One
4. Firestone UltraFlash One-Part liquid flashing
5. Or approved equal

L. Emulsion and Aluminized Coating:
1. GAF
2. Johns Manville
3. CertainTeed
4. Firestone
5. Or approved equal

M. Flashing Cement:
1. Johns Manville MBR two-part Flashing Cement or Type III Steep Asphalt by GAF, Firestone, CertainTeed or approved equal.

N. Penetration Seal, Penetration Flashing and Low Flashing Materials:
1. M-weld Roofing Systems-Building Solutions, “M-Curb System” penetration seal system.

2. WTT Systems, “Weather-Tite Lockin Pocket” with “Weather-Tite Hurricane Force Universal Sealer” and “Weather-Tite LPS Sealant” penetration seal system.
3. Kemco, “Kemperol BR” penetration flashing and low flashing system.
4. Johns Manville, “PermaFlash” penetration flashing and low flashing system.
5. Triflex, “Trifex D” penetration flashing and low flashing system.
6. Applied Liquid Technologies, “Protec” penetration flashing and low flashing system.
7. Thermo Manufacturing Systems, “Thermo SEBS System” penetration flashing and low flashing system.
8. Sika/Liquid Plastics, “Decothane SP” penetration flashing and low flashing system.
9. Or approved equal

O. Walkway Pads/Splash Pads/Protection Pads:
1. Celotex Corp. "Carey-tred".
2. W.R. Meadows Inc."Sealtight Whitewalk".
3. Termastic Construction Materials "Roof Walk".
4. Or approved equal

P. Elastomeric Cement:
1. Tremco Manufacturing Co. "Poly roof".
2. Durok Bldg. Materials "Durok Rubber Cement".
3. Karnak Chemical Corp. "AR Elastomeric".
4. Firestone S-10 Pourable Sealer.
5. Or approved equal

Q. Perlite Cant Strip:
1. GAF
2. Johns Manville
3. Atlas
4. Or approved equal

R. Premanufactured Expansion Joint Flashing at Wall and Roof Expansion Joint:
1. Johns Manville
2. GAF
3. CertainTeed
4. Or approved equal

2.2 MATERIALS – HOT-APPLIED SYSTEMS

A. Asphalt Primer; Quick drying; ASTM D41.

B. Steep Asphalt: ASTM D312, Type III.

C. Coatings:
1. Asphalt emulsion, fibrated; ASTM D 1227, Type IV.
2. Aluminum roof coating, fibrated; D-2824.
3. Urethane elastomer, single component, white or light grey.

D. Modified Flashing Cement: MBR Flashing Cement - two-component, elastomeric, liquid applied flashing material, consisting of an asphalt/urethane base material and an activator.

E. Elastomeric Cement: Urethane, Neoprene or Polysulfide elastomer, trowel grade, non-sag with a minimum of 300 percent expansion and 95 percent recovery when cured.
   1. "Polyroof" by Tremco.
   2. "Durok Rubber Cement" by Durok.
   3. "Polyseal" by Monroe.
   4. Or approved equal

F. Felts:
   1. Asphalt Fiberglass Felt: Asphalt impregnated glass mat, ASTM D 2178, Type VI. UL Classified.
   2. Flashing Cap Sheet: Reinforced modified cap flashing sheet, specifically designed by the manufacturer for use as the top ply of built-up flashings. UL Classified.
   3. Asphalt Fiberglass Venting Base Sheet: One ply composed of glass mat with coating asphalt and a coarse mineral surfacing on one side of sheet; ASTM D-3672 or D-4897, Type II
   4. Mineral-Surfaced Modified Bitumen Cap Sheet: Fire resistant, coated granule surfaced modified bitumen sheet containing a core of glass fiber or polyester mat coated with flexible SBS polymer-modified asphalt. Conforming to or exceeding the requirements of ASTM D 6163, or D 6164, Type I Grade G. UL Classified. Initial Solar Reflectance 0.75 minimum, in accordance with Cool Roof Rating Council. Solar Reflectance Index 79 minimum, in accordance with ASTM E1980.

G. Glass Fabric, 20/20 woven mesh, resin or asphalt coated; ASTM D 1668.

H. Polyisocyanurate roof insulation board. Thickness to match the existing roof insulation.

I. Materials for Penetration Seals, Penetration Flashing, Low Flashing, and Pitch Pockets
   1. Penetration seals, penetration flashing, and low flashing must be of materials described in subparagraph a., b., c., d. or e., below, as deemed appropriate by the roofing manufacturer. Provide primers, mineral granule surfaced target patches, catalysts, and other auxiliary materials to complete each system in accordance with requirements of the seal and flashing system manufacturer and the roofing system manufacturer.
      a. Penetration seal: M-Curb System, consisting of a preformed structural urethane outer shell filled with a two-part urethane rubber sealant such as M-Thane. A structural high viscosity urethane adhesive such as M-Bond must be used to bond the shell to the roof deck as well as seal the edges.
      b. Penetration flashing and low flashing: Kemporol BR system, consisting of polyester fleece-reinforced two-component polyester resin membrane.
      c. Penetration flashing and low flashing: Johns Manville PermaFlash system, consisting of polyester fabric-reinforced two-part asphalt modified urethane flashing membrane.
      d. Penetration flashing and low flashing: Triflex D system, consisting of polyester fleece-reinforced two-component polyester resin membrane.
      e. Penetration flashing and low flashing: Applied Liquid Technologies Protec system, consisting of glass fiber fabric reinforced two-component polyester resin membrane.
      f. Or approved equal.

2.3 MATERIALS – COLD-APPLIED SYSTEMS

A. Johns Manville, Siplast Parapro PMMA Liquid Flashing, Sika PermaFlash Primer or approved equal; organo-silane compound dispersed in isopropyl alcohol.

B. PermaFlash, Majorseal, Smartflash or approved equal: Liquid flashing system Two-Part adhesive reinforced with a polyester scrim
   1. SBS Flashing Cement: Two-component, elastomeric, liquid applied flashing material, consisting of an asphalt/urethane base material and also used for penetrations and other details.
      a. Typical Physical Properties:
         1) ASTM D 412, Tensile Strength: 600 psi (4.13 MPa).
         2) ASTM D 412, Elongation: > 300%.
         3) ASTM E 96 Method E 100°F (38°C), 100 mil (2.5 mm) sheet, Permeability to Water Vapor: 0.03 perms.
         4) Working Time* @ 75ºF (25ºC): 30 min.
         5) Rainproof After* @ 75ºF (25ºC): 4 h.
         6) ASTM D 2240, Hardness @ 77°F (25°C): 65 Shore A.
         7) Crack Bridging After Heat Aging: 1/8" (3 mm).
         8) ASTM D 36, Softening Point, Ring and Ball: 275°F (135°C).
         9) ASTM C 836 Elastomeric Waterproofing: Exceeds All Criteria.
         10) ASTM D 4060, Abrasion Resistance 1,000 gr./1,000 rev., CS-17 wheel: 1.2 mg Loss.

C. Bonding Adhesive:
   1. Two-component, solvent free, elastomeric, cold application adhesive, consisting of an asphalt base material and an activator.

D. Modified Flashing Cement:
   1. A two-component, elastomeric, liquid applied flashing material, consisting of an asphalt/urethane base material and an activator.

E. Felts:
   1. Asphalt coated Fiberglass Base Felt: A wet process fiber glass mat coated with weathering grade asphalt and then surfaced with a fine mineral parting agent. ASTM D 4601, Type II
   2. Flashing Cap Sheet: Reinforced modified cap flashing sheet, specifically designed by the manufacturer for use as the top ply of built-up flashings. UL Classified.
   3. Mineral-Surfaced Modified Bitumen Cap Sheet:
      a. Fire resistant, coated granule surfaced modified bitumen sheet containing a core of glass fiber or polyester mat coated with flexible SBS polymer-modified asphalt. Conforming to or exceeding the requirements of ASTM D 6163, or D 6164, Type I Grade G. UL Classified. Initial Solar Reflectance 0.75 minimum, in accordance with Cool Roof Rating Council. Solar Reflectance Index 79 minimum, in accordance with ASTM E1980.
   4. Modified Bitumen Base Sheet:
      a. A modified bitumen sheet incorporating the features of a medium weight fiber glass mat with a blend of SBS (Styrene-Butadiene-Styrene) rubber and high quality asphalt. Conforming to or exceeding the requirements of criteria for ASTM D 6163, Type I, Grade S. Thickness of 90 Mils. UL Classified.

F. Materials for Penetration Seals, Penetration Flashing, Low Flashing, and Pitch Pockets:

1. Penetration seals, penetration flashing, and low flashing must be of materials described as deemed appropriate by the roofing manufacturer. Provide primers, mineral granule surfaced target patches, catalysts, and other auxiliary materials to complete each system in accordance with requirements of the seal and flashing system manufacturer and the roofing system manufacturer.
    a. Penetration flashing and low flashing: Johns Manville PermaFlash system, GAF Majorseal, CertainTeed Smartflash or approved equal system, consisting of polyester fabric-reinforced two-part asphalt modified urethane flashing membrane.

2.4 INSULATION

A. Provide type and thickness of insulation to match existing. If insulation is of a type not specified below, utilize polyisocyanurate. Polyisocyanurate insulation must have a 15-year time weighted average Long Term Thermal Resistance (LTTR) value of at least 5.88 for each inch of insulation thickness, as determined in accordance with ASTM C1289 or CAN/ULC-S770 (Standard Test Method for Determination of Long Term Thermal Resistance of Closed Cell Thermal Insulating Foams). Perlite and fiberboard must have an R-value of at least 1.3 for ½" thickness.
    1. Types:
        a. Polyisocyanurate - ASTM C 1289, Type II, Class 1, Grade 2
        b. Perlite - ASTM C 728
        c. Fiberboard - ASTM C 208
    2. All insulation: Factory Mutual, Class 1 or U.L. Class A.

B. Rigid Insulation: Provide insulation using one of the assemblies described below in subparagraph 1. or subparagraph 2.
    1. Three Layers of Insulation:
        a. Three layers of insulation consisting of two layers of polyisocyanurate insulation, and a top layer of fiberboard or perlite insulation.
            1) Polyisocyanurate Insulation: Closed cell polyisocyanurate foam core skinned on both sides with factory applied facers of the generic type recommended by the membrane manufacturer. ASTM C1289, Type II, Class 1, Grade 2. UL Classified. Thickness of bottom layer must be 2". Thickness of second layer must be not less than 1.5" and not more than 2". Board size 48"x48" maximum.
                a) For steel decks: Factory Mutual Class 1 approved for direct application on steel decks.
        b. Top layer: 1/2" thick minimum. Perlite board insulation complying with Federal Specification HH-1-529b, ASTM C728. Fiberboard complying with ASTM C208. UL Classified.
        c. Provide additional layers of polyisocyanurate insulation where required to meet indicated thermal insulating values, subject to approval of the membrane manufacturer and the Commissioner. Total thickness of insulation must be as indicated on the Drawings.
    2. Two Layers of Insulation:
        a. Two layers of insulation consisting of one layer of polyisocyanurate insulation, and a top layer of composite insulation. Board size 48"x48" maximum.
            1) Base layer: Closed cell polyisocyanurate foam core skinned on both sides with factory applied facers of the generic type recommended by the membrane manufacturer. ASTM C 1289, Type II, Class 1, Grade 2. UL Classified. Thickness 2".
            2) Top layer: A layer of polyisocyanurate foam integrally bonded to a layer of perlite or wood fiberboard on one side and a nonasphaltic fiberglass mat on the other. Total thickness of top layer 1.5" minimum, 2.5" maximum.

3. Provide additional layers of polyisocyanurate insulation where required to meet indicated thermal insulating values, subject to approval of the membrane manufacturer and the Commissioner. Total thickness of insulation must be as indicated on the Drawings.

2.5 MATERIALS – MISCELLANEOUS

A. Cant, pre-formed treated fiber, 4" standard size.

B. Wood Nailers: Preservative (pressure) treated construction grade lumber or construction grade cedar, redwood or cypress.

C. Sheet Metal:
1. 16 oz. cold rolled copper.
2. 16 oz. zinc/tin alloy coated hot-dipped cold rolled copper.
3. 26 ga. stainless steel, flashing grade.
4. Sheet Lead: ASTM B 29. Minimum Wgt. 4 lbs per sq ft.

D. Fasteners:
1. Expansion bolts, cadmium plated, 3/8" diameter.
2. Machine bolts, cadmium plated, 3/8" diameter.
3. Sheet metal screws, #8, pan head.
   a. Stainless steel.
   b. Cadmium plated steel.
4. Wood screws, #8, round head.
   a. Brass or bronze.
   b. Cadmium plated steel
5. Roofing nails, "Stronghold" type with large head, 12 ga.
   a. Copper.
   b. Stainless steel.
   c. Galvanized steel.

E. No. 1 gravel or crushed stone, clean and dry.

F. Protection Pads: "Carey Tread" by Celotex, "Sealtight Whitewalk" by W.R. Meadows, "Roof Walk" by Texmastic Construction Materials or approved equal.

G. Pre-manufactured Equipment Curbs: Prefabricated roof curbs must be of box section design, constructed using minimum 18 gauge galvanized steel, (14 gauge for curbs supporting HVAC units or as required) with fully mitered and welded corners, 3" cant. Roof Curbs must be internally reinforced on any side longer than 3' 0" and must have factory internal base plate. Roof Curbs to be insulated with 1 1/2" thick 3lb. density fiberglass insulation, and factory installed wood nailers fastened from underside with TEK screws. Height to be 8" above the finished roof or as detailed. Roof Curbs must be level at the top with pitch built-in when deck slopes 1/4 of an inch per foot or greater, or as detailed. Prefabricated Roof Curbs must be manufactured by Roof Products & Systems Corporation, Bensenville, IL, Thybar Corporation, Acme Manufacturing Corporation or approved equal. Contractor fabricated Roof Curbs will not be accepted.

H. Premanufactured Equipment Rails: Equipment Rails must be manufactured of 18 or 14 gauge galvanized steel as required. Fully mitered and welded corners, 3" cant. Equipment Rails must be internally reinforced

with integral base plate and factory installed wood nailer. (Specify 2x4,6,8,10,12). Height to be 8" above finished roof or as detailed. Equipment Rails must span a minimum of two (2) roof members and not cantilever more than 6". Equipment Rails must be level at the top with pitch built-in when deck slopes 1/4 of an inch per foot or greater, or as detailed. Equipment Rails must be manufactured by Roof Products & Systems Corp., Bensenville, IL, Portals Plus, Acme Manufacturing Corporation or approved equal. Contractor fabricated Equipment Rails will not be accepted.

I. Premanufactured Pipe Portals: The pipe portal must include an 18 gauge galvanized steel roof curbs with integral base plate, continuously welded corner seams, factory-installed wood nailer and $1^1/_2$" 3lb. rigid fiberglass insulation. The pipe portal must be furnished with a laminated acrylic coated ABS plastic curb cover with prepunched holes and molded sealing ring on an 8" collared opening, and an EPDM compression molded cap with stainless steel snaplock clamps. Curbs covers must be resistant to ozone and ultraviolet rays and must have a serviceable temperature range of -40°F to positive 250°F. The molded sealing ring on the collared opening and the groove in the rubber cap must be installed to assure a weather-tight pressure and mechanical seal. The protective rubber caps must have a serviceable temperature range of -60°F to positive 250°F and must be resistant to ozone and ultraviolet rays. The conical shaped steps of the nipple must provide a weatherproof seal around the penetration. The stainless steel snaplock clamps must provide added protection to guarantee the seal. Pipe Portal must be provided with the number of caps as shown on the drawings and must be as manufactured by Roof Products & Systems Corporation, Bensenville, IL, Portals Plus, Miro Industries or approved equal.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 VERIFICATIONS OF CONDITIONS

A. Testing Existing Roof Drains and Conductor Pipes:
   1. Before commencing with the Work, water test all existing drains and conductor pipes, submit a written report to the Commissioner, indicating which drains or conductors, if any, are not functioning properly.

3.3 PREPARATION – HOT-APPLIED SYSTEM

A. Moisture Protection: Keep the roof waterproof. Limit removals of existing materials to areas that can be either completed or temporarily sealed before the end of each workday.

B. Limit the removal of existing materials to the absolute minimum that is necessary to install the new Work.

C. Spud off all aggregate from existing roof surfaces that will be bonded to new materials.

D. Thoroughly clean, dry, and prime all existing roof surfaces that will be bonded to new materials.

E. Where existing insulation is removed to install nailers, do not remove the existing vapor seal. Patch with asphalt cement and asphalt fiberglass felts if damaged.

F. Heating Bitumen:
   1. Preparation:
      a. Use separate kettles or tankers for heating different types of asphalt. Kettle may not be placed on roofs.
      b. The heating process must be strictly regulated by means of an automatic thermostatic control of an approved type for positive temperature control. Kettles or tankers must be the immersion tube type, fire by Liquid LP gas, and must have 100% safety shutoff.
      c. Equip each kettle or tanker with a recording thermometer that will graphically indicate and record on a chart the maximum and minimum temperatures to which materials have been heated. Recording thermometers must be capable of accurately recording temperatures as high as 600˚F and as low as 0˚F. The thermometers must be properly maintained at all times. Kettles or tankers without recording thermometers in good working condition must not be used. At the end of each working day, turn the chart from the thermometer on each kettle or tanker over to the Commissioner If any bitumen is overheated, remove it from the site in the presence of the Commissioner.
      d. If any underheated or overheated bitumen has been applied on the roof, remove that portion of the roof.
      e. Kettle is to placed on the ground, with the asphalt pumped to the roof.
         1) Provide fire extinguishers on the roof in the vicinity of the work as required to ensure the safety of the roof.
         2) In all cases comply with requirements of the NYC Fire Department in locating equipment.
   2. Heating Asphalt Bitumen:
      a. Heat the bitumen in accordance with the Equiviscous Temperature information furnished by the bitumen manufacturer for that specific run of bitumen.
         1) In no case must be asphalt be heated to or above the actual COC Flash Point (ANSI/ASTM D92); or the finished blowing temperature for more than 4 hours.
         2) Maintain the temperature of the bitumen at the point of application within the Equiviscous Temperature Range. Use insulated pipes, buckets, luggers, and other insulated roofers equipment as required by the field conditions.
         3) Contractor must have at least one hand-held thermometer for each crew installing hot asphalt in order to ensure compliance with EVT.
   3. Application temperature: The accepted application temperature range for asphalt is the equiviscous temperature, (EVT) 25˚F. All felt installation must occur in this range to be acceptable.

3.4 PREPARATION – COLD-APPLIED SYSTEM

A. Bituminous and Modified Bituminous Membranes - Basic Cold Process Repair Techniques:
   1. Moisture Protection: Keep the roof waterproof. Limit removals of existing materials to areas that can be either completed or temporarily sealed before the end of each workday.
   2. Limit the removal of existing materials to the absolute minimum that is necessary to install the new Work.
   3. Gravel Surfaced Bituminous membrane system - Spud off all aggregate from existing roof surfaces that will be bonded to new materials. Clean and dry surfaces approximately 12” to either side of damaged area. On aggregate surfaced roofs, the surfacing should be chipped away down to the felts.
   4. Thoroughly clean, dry, and prime all existing roof surfaces that will be bonded to new materials. Prepare surfaces with brush application of bituminous primer.

5. Modified Bituminous membrane system - Remove damaged material, clean surfaces to be bonded. Wire brush elastomeric surfaces to remove oxidized layer, wipe with ether or acetone to remove surface moisture. Prepare surfaces with brush application of bituminous primer.
6. Where existing insulation is removed to install nailers, do not remove the existing vapor seal. Patch with asphalt cement and asphalt fiberglass felts if damaged.

B. PermaFlash, Majorseal, Smarflash or approved equivalent System:
1. Surface Preparation - All surfaces to receive the liquid flashing system must be clean, dry and free of any dirt, dust, debris, rust, and oils. Remove contaminants such as oils with a suitable solvent cleaner. For best results it is recommended that surfaces such as metals and plastics be abraded. Mask off with tape any areas not intended to receive flashing cement.

C. SBS Flashing Adhesive Preparation:
1. The adhesive is prepared in the flashing cement manufacturer's pail, using the appropriate mixing equipment mentioned. Flashing cement activator is packaged in premeasured containers with the exact amount of material necessary to react with the contents of the corresponding flashing cement base.
2. Continuously move the mixer in an up-and-down and side-to-side motion.
3. Do not dump the activator into the pail in one motion. To produce a complete mix, pour the MBR Flashing Cement Activator slowly into the vortex caused by the rotating mixer.
4. The mix is complete in three minutes. Do not under mix the batch. Over mixing will reduce working time.
5. Do not stockpile adhesive, since the material will cure to an unworkable consistency.
6. The pot life is dependent on the ambient temperature; extremes in temperature can shorten the pot life of the mix. The mechanic will have to use the mixed material in approximately:

Temperature	(°F)	50	60	70	80	90	100
	(°C)	10	16	21	27	32	38
Minutes		20	25	30	30	30	25

7. Time the mixing of individual pails of adhesive so that only one can of freshly mixed adhesive is ready for each application crew. In cold weather, store and mix the material at room temperature.

D. SBS Modified Bitumen Roof Bonding Adhesive Preparation:
1. Prepare bonding adhesive on site by adding specific pre-measured amounts of activator per manufacturer instructions in manufacturer provided container with the use of a mixer and electric drill.
2. Follow measurement instructions to provide exactly the correct amount of material necessary to react with the contents of bonding adhesive and activator to generate total mixed product. The activator is heavier and has a lower viscosity than the base material.
3. Follow manufacturer instructions to produce a complete mix, the with bonding adhesive activator to be poured slowly into the vortex caused by the rotating mixer. The activator must not be dumped into the pail in one motion.
4. The mixer should be constantly moved about the pail in an up-and-down and side-to-side motion. The mix is complete in 3 minutes. Do not under mix.
5. The adhesive has a pot life that is dependent on the ambient temperature. The applicator will have to use the mixed material in approximately:

Temperature	(°F)	50	60	70	80	90	100
	(°C)	10	16	21	27	32	38
Minutes		55	50	45	40	35	30

6. The mixing of individual pails of adhesive should be timed so that one can of freshly mixed material is ready for the application crew. Mixed adhesive must not be stockpiled, since the material will cure to an unworkable viscosity before the application crew can use it.

3.5 CURB INSTALLATIONS

A. Install prefabricated curbs and pipe portals as per manufacturer's instructions and in a setting bed of modified flashing cement. Mechanically anchor using adhesive anchors.

3.6 INSTALLATION – HOT-APPLIED SYSTEM

A. Wood Nailers: Set each nailer into a full bed of asphalt plastic cement and secure with bolts (at least two each side) to the deck. Fill voids (if any) between the nailer and the existing insulation with roof insulation, set in plastic asphalt cement. Set fiber cants in plastic asphalt cement.

B. Roof Membrane Repairs: Patch the roof membrane with alternating layers of asphalt and felt for a minimum of 4 plies. Install the necessary number of plies to finish above the adjacent roof membrane level to eliminate water ponding low spots. Match the existing system in terms of installing vapor barrier, vent base sheet mechanically fastened, if any, and insulation.
   1. Make all felt laps at least 4" wide.
   2. After matching existing adjoining roof level, assure that at least four (4) plies of felt are lapped out onto the existing roof membrane by a minimum of 8". Envelope insulation with Type VI felt plies. First ply of the roofing membrane must lap over existing adjacent membrane a minimum of 6". Lap all other plies over the preceding a minimum of 6".
   3. At metal base flashings, turn felts up on the vertical at least 4".
   4. At fiber or metal cants, carry the last 4 plies to the top of the cant.
   5. If existing roof is aggregate surface, install aggregate at a rate of 600 lbs/square in asphalt.

C. Built-up Flashing:
   1. Prime curb surfaces.
   2. Install two plies of asphalt fiberglass felt and one ply of flashing cap sheet, each in a full bed of modified flashing cement.
   3. Secure top edge of flashing with fasteners placed at 6" centers.
      a. To Wood: Use roofing nails thru $1^1/_2$" diameter metal disks.
      b. To Sheet Metal: Use sheet metal screws thru $1^1/_2$" diameter metal disks.
   4. Seal top edge with modified flashing cement and fabric.
   5. Finish the built-up flashing and adjacent roof surface (including all spudded areas) as follows:
      a. For Existing Aggregate Surface: Apply heavy brush coat of asphalt to cant and vertical flashing surfaces. On horizontal surfaces, embed aggregate in a 1/4" thick troweling of asphalt compatible with the existing roofing.

D. Elastomeric Flashing:
   1. Prime metal surfaces with quick drying asphalt primer. Let dry to the touch.

2. Fully embed strips of glass fabric in elastomeric cement trowelings to obtain a 5-course membrane with a minimum thickness of 1/4".
3. Finish the flashing with a final smooth troweling of elastomeric cement to hide all fabric. Cover horizontal (spudded) roof surfaces with gravel placed into additional freshly applied elastomeric cement.

E. Metal Base Flashing:
1. Provide metal base flashing as shown on the Drawing and as follows:
   a. Lock and solder all joints.
   b. Hem flange edge 1/2".
   c. Set flange in full bed of plastic cement.
   d. Secure with roofing nails placed at 3" (staggered) centers.
   e. Install two felt fiberglass coverstrips, 8" and 12" wide, in a full bed of plastic cement.
   f. Finish with aggregate embedded in 1/4" thick troweling of plastic cement.

F. Metal Cap Flashing:
1. Provide metal cap flashing as shown on the Drawing and as follows:
   a. Lock and solder all joints.
   b. Provide minimum of 3" lap over base flashing.
   c. Turn flange over top of curb and turn edge up at least 1" behind ventilator housing.
   d. Seal all penetrations (ventilator housing bolts) with silicone sealant.

3.7 INSTALLATION – COLD-APPLIED SYSTEM, GRAVEL SURFACED MEMBRANE

A. Wood Nailers: Set each nailer into a full bed of flashing adhesive and secure with bolts (at least two each side) to the deck. Fill voids (if any) between the nailer and the existing insulation with roof insulation, set in plastic asphalt cement. Set fiber cants in flashing adhesive.

B. Roof Membrane Repairs – Patch the roof membrane with alternating layers of bonding adhesive and layers of fiberglass reinforced base sheet for a minimum of 3 plies. Install the necessary number of plies to finish above the adjacent roof membrane level to eliminate water ponding low spots. Match the existing system in terms of installing vapor barrier, vent base sheet mechanically fastened, if any, and insulation.
1. Membrane Installation Sequencing (from substrate to uppermost ply).
2. Base sheet must be cut into 18-foot lengths and be allowed to relax before being installed.
3. Start base and first sheet with a 12" width. The following base sheet courses are to be applied full width, overlapping the preceding felt 2" on the side laps and 4" on the end laps. Install felt so that it is firmly and uniformly set, without voids, into bonding adhesive applied before the felt at a rate of 3 gallons per square.
4. Apply base sheet a piece 18" wide, then over that, a full width piece. The following felts are to be applied full width, overlapping the preceding felts by 19" so that at least 2 plies of felt cover the base at all locations.
5. Install each felt so that it is firmly and uniformly set, without voids, into the JM MBR Bonding Adhesive applied before the felt at a nominal rate of $1^1/_2$ to 2 gallons per square over the entire surface. Roll installed felts with a weighted roller before the end of each workday.
6. Surfacing:
   a. After the interply adhesive has cured, apply bonding adhesive at the rate of 6 gallons per square or per manufacturer recommendations. Into the bonding adhesive embed an acceptable gravel

at a rate of 400 lb. per square or an acceptable slag at a rate of 300 lb. or per manufacturer instructions.

b. Aggregate must be installed so that there is complete coverage across the entire surface and at least 50% of the aggregate is solidly adhered in the bonding adhesive. Gravel aggregate should meet the requirements of ASTM D 1863.

3.8 INSTALLATION – COLD-APPLIED SYSTEM, MODIFIED BITUMEN MEMBRANE

A. Wood Nailers: Set each nailer into a full bed of flashing adhesive and secure with bolts (at least two each side) to the deck. Fill voids (if any) between the nailer and the existing insulation with roof insulation, set in plastic asphalt cement. Set fiber cants in flashing adhesive.

B. Roof Membrane Repairs – Patch the roof membrane with alternating layers of bonding adhesive and layers of fiberglass reinforced base sheet for a minimum of 3 plies. Install the necessary number of plies to finish above the adjacent roof membrane level to eliminate water ponding low spots. Match the existing system in terms of installing vapor barrier, vent base sheet mechanically fastened, if any, and insulation.

C. Install modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants as follows:
1. Adhere to substrate in a approved cold applied adhesive.
2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

D. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Apply roofing granules to cover exuded bead at laps while bead is hot.

E. Install roofing membrane sheets so side and end laps shed water.

F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.9 FLASHINGS

A. Fluid-Applied Flashing System:
1. Liquid applied flashing primer Application – Adhere to manufacturer instructions for preparation of material. All non-porous surfaces to receive flashing cement should be primed no more than 1 hour prior to application. Flashing primer can be wiped on with a cloth rag. Surfaces only need to be wiped once. Replace soiled rags with clean rags as necessary. Ensure flashing primer is dry prior to application of flashing cement.
2. Lay out reinforcement fabric around penetration and cut to fit. Wrap fabric around penetration and bridge all vertical to horizontal transitions.
3. Apply fluid-applied flashing directly to prepared substrate. Adhere fabric by pressing into the fluid-applied flashing while still wet.
4. Completely cover fabric with at least 60 mil coat wet film thickness of fluid-applied flashing, and as required by the manufacturer.
5. Extend top coat of fluid-applied flashing system 2 inches beyond edges of reinforcement fabric.

B. Built-up Flashing:
   1. Prime curb surfaces.
   2. Install two plies of asphalt fiberglass felt and one ply of flashing cap sheet, each in a full bed of modified flashing cement or hot asphalt.
   3. Secure top edge of flashing with fasteners placed at 6" centers.
      a. To Wood: Use roofing nails thru $1^1/_2$" diameter metal disks.
      b. To Sheet Metal: Use sheet metal screws thru $1^1/_2$" diameter metal disks.
   4. Seal top edge with modified flashing cement and fabric. Seal all seams with modified flashing cement.
   5. Finish the built-up flashing and adjacent roof surface (including all spudded areas) as follows:
      a. For Existing Aggregate Surface: Apply heavy brush coat of asphalt to cant and vertical flashing surfaces. On horizontal surfaces, embed aggregate in a 1/4" thick troweling of asphalt compatible with the existing roofing.

3.10 CLEANING

A. Clean debris from roofs, gutters, downspouts, and drainage systems. Test drainage system for proper operation.

END OF SECTION 07 52 00

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SECTION 07 84 00 - FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Work Included: Provide products in accordance with the Contract Documents. The Work of this Section will include but not be limited to the following:
   1. Penetrations through fire-resistance-rated floor and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
   2. Penetrations through fire-resistance-rated walls and partitions including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
   3. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.
   4. Joints and terminations in fire-resistance-rated walls, partitions, smoke barriers and construction enclosing compartmentalized areas, including both same plane, changes in plane, edge of slab and other joint conditions.
   5. Sealant joints in fire-resistance-rated construction.
   6. Furnishing of dams, clips and closures for support and containment of fire stopping materials and installation of dams, clips and closures where possible to install after completion of floors, walls or other construction.
   7. Coordinate with all trades and construction which affects or is affected by the Work of this Section.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. General: For the following constructions, provide firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly penetrated.
   1. Fire-resistance-rated load-bearing walls, including partitions, with fire-protection-rated openings.
   2. Fire-resistance-rated non-load-bearing walls, including partitions, with fire-protection-rated openings.
   3. Fire-resistance-rated floor assemblies, including slab perimeter and floor edge conditions.
   4. Fire-resistance-rated roof assemblies.

B. Systems must be capable of preventing passage of smoke, flame and hot gases sufficient to ignite cotton waste, when tested in accordance with ASTM E 814 and ANSI/UL 1479 for firestop systems and ASTM E 119 and ANSI/UL 2079 for joint systems and fire containment, including perimeter conditions.

C. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

D. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, as determined per ASTM E 814, where systems protect penetrating items exposed to potential contact with adjacent materials in occupied floor areas:
   1. Penetrations located outside wall cavities.
   2. Penetrations located outside fire-resistive shaft enclosures.
   3. Penetrations located in construction containing fire-protection-rated openings.
   4. Penetrating items larger than 4-inch-diameter nominal pipe or 16 sq. in. in overall cross-sectional area.

E. Jointed Systems: Provide joint firestop systems indicated, as determined per ASTM E 1399, but not less than that equaling or exceeding fire-resistance rating of adjoining construction.

F. For firestop systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
   1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
   2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.
   3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

G. For firestop systems exposed to view, provide products with flame-spread ratings of less than 25 and smoke-developed ratings of less than 450, as determined per ASTM E 84.

H. Firestop Systems do not reestablish the structural integrity of load bearing partitions and assemblies or support live loads and traffic. Installer must consult the Commissioner prior to penetrating any load bearing assembly.

I. Where subject to movement, firestopping materials used must remain flexible and allow for normal movement of building structure, substrates, penetrating items and related surfaces and items without affecting integrity and performance of firestopping materials and system

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product data for each type of product specified.
   1. Certification by firestopping manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs) and are nontoxic to building occupants.
   2. In addition to the above requirements, provide MEA certificates indicating the proposed product/system (including all system components), MEA approval numbers and other data illustrating acceptance of such products as required by the NYC Department of Buildings.

C. Shop Drawings detailing materials, installation methods, and relationships to adjoining construction for each through-penetration firestop system, and each kind of construction condition penetrated and kind of penetrating item. Include firestop design designation of qualified testing and inspecting agency evidencing compliance with requirements for each condition indicated.

1. List of Conditions: Shop Drawings must list all firestopping categories indicated or expected for the project. For each type of construction element and assembly indicated, list the UL Design Number to be complied with, include coordinated specified product data for each product incorporated into firestopping assemblies. Attach a copy of each UL Design Number listed.
   a. In addition to the above requirements, provide MEA certificates indicating the proposed product/system (including all system components), MEA approval numbers and other data illustrating acceptance of such products and conditions as required by the NYC Department of Buildings.
2. For unusual penetrations which have no formal tested assembly and which require modification of qualified testing and inspecting agency's illustration to suit the particular unusual through-penetration firestop condition, submit Drawings and product data and associated illustrations prepared by the manufacturer including required modifications clearly illustrated.
   a. Manufacturer’s engineering judgment must be derived from similar UL system designs or other applicable tests. Engineer judgment Drawings must follow requirements set forth by the International Firestop Council.
      1) The Manufacturer issuing the engineering judgment must be responsible for issued engineering judgments without any adjustment to the responsibilities of the entities involved.

D. Product certificates signed by manufacturers of firestopping products certifying that their products comply with specified requirements.

E. Product test reports from, and based on tests performed by, a qualified testing and inspecting agency evidencing compliance of firestopping with requirements based on comprehensive testing of current product

F. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience.

G. Submit product specifications and material data (MSD) safety sheets for each product.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Fire-Test-Response Characteristics: Provide firestopping that complies with the following requirements and those specified under the "System Performance Requirements" article:
1. All firestopping systems must be U.L. listed and must be installed as a completed U.L. listed assembly. Firestop System installation must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated
2. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, Warnock Hersey, or another agency performing testing and follow-up inspection services for firestop systems that is acceptable to New York City Building Code, New York City Mechanical Code.
3. Fire-Resistance Ratings of Joint Sealants: As indicated by reference to design designations listed by UL in their "Fire Resistance Directory" or by another qualified testing and inspecting agency.
   a. Joint sealants, including backing materials, bear classification marking of qualified testing and inspection agency.

4. Proposed firestopping materials and methods must conform to State and Local Codes.

C. Information on Drawings referring to specific design designations of through-penetration firestop systems is intended to establish requirements for performance based on conditions that are expected to exist during installation. Any changes in conditions and designated systems require the Commissioner's prior approval. Submit documentation showing that the performance of proposed substitutions equals or exceeds that of the systems they would replace and are acceptable to the Commissioner.

D. Installer Qualifications: Engage an experienced firm that has recently completed Firestopping projects similar in cost, material, design and extent to that indicated by this section and whose work has resulted in construction with a record of successful in-service performance.
   1. The Contractor performing the Work of this Section may demonstrate compliance with the above qualification requirements by demonstrating that it is properly trained by a manufacturer designated as acceptable in these Specifications.

E. Single-Source Responsibility: Obtain all firestopping systems for each kind of penetration, joint and construction condition indicated from a single manufacturer.

F. Field-Constructed Mockup: Prior to installing firestopping, erect mockups for each different through-penetration firestop system indicated to verify selections made and to demonstrate qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final installations.
   1. Locate mockups on site in locations indicated or, if not indicated, as directed by the Commissioner.
   2. Notify the Commissioner 1 week in advance of the dates and times when mockups will be erected.
   3. Obtain Commissioner's acceptance of mockups before start of final unit of Work.
   4. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging completed unit of Work.
      a. Accepted mockups in an undisturbed condition at time of Substantial Completion may become part of completed unit of Work.

G. Provide firestopping products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy."

H. Coordinating Work: Coordinate construction of openings and penetrating items to ensure that designated through-penetration firestop systems are installed per specified requirements.

I. The Contractor will employ and pay a qualified inspection agency to check installed firestopping systems for compliance with requirements.
   1. Tests for thickness and density of applied material may be performed by an independent testing agency retained by and paid by the Contractor. Where test results are unsatisfactory in sample areas, additional tests in other areas may be made. Such further testing, if required, must be by the same testing agency and be paid for by the Contractor.

J. Firestopping system manufacturer's direct representative (not distributor or agent) must be on-site during initial installation of firestop systems to instruct appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver firestopping products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multicomponent materials.

B. Store and handle firestopping materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Do not install firestopping when ambient or substrate temperatures are outside limits permitted by firestopping manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilation: Ventilate firestopping per firestopping manufacturers' instructions by natural means or, where this is inadequate, forced air circulation.

1.8 SEQUENCING AND SCHEDULING

A. Notify the inspection agency at least 1 week in advance of firestopping installations; confirm dates and times on days preceding each series of installations.

B. Do not cover up those firestopping installations that will become concealed behind other construction until the Commissioner has examined each installation.
   1. Provide inspection schedule for anticipated work and submit as of Article 1.8A.

PART 2 - PRODUCTS

2.1 FIRESTOPPING, GENERAL

A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.

B. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" article in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include but are not limited to the following items:
   1. Permanent forming/damming/backing materials including the following:
      a. Semi-refractory fiber (mineral wool) insulation.
      b. Ceramic fiber.
      c. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
      d. Fire-rated formboard.
      e. Joint fillers for joint sealants.

2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.
6. Safing Clips.
7. Metal support plates.

C. Applications: Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.

2.2 MANUFACTURERS AND PRODUCTS

A. General: Specified products may be components of a complete firestopping system. Provide all components necessary to provide complete systems as designated on Drawings.

B. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Hilti Construction Chemicals, Inc.
2. 3M Fire Protection Products.
3. Specified Technologies Inc. (STI).
4. Or approved equal.

C. Firestopping Products: Subject to compliance with requirement, provide one of the following:
1. Water Based Intumescent Firestop Sealant
2. Intumescent Firestop Flexible Block / Pillows
3. Water Based Elastomeric Firestop Joint Spray
4. Silicone Based Elastomeric Firestop Sealant
5. Acrylic Based Firestop Sealant
6. Intumescent Firestop Collar
7. Cast-In Place Intumescent Firestop Sleeve Device
8. Intumescent, Non-hardening Firestop Putty
9. Trowelable Firestop Compound/Mortar
10. Or approved equal

2.3 MIXING

A. For those products requiring mixing prior to application, comply with firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce firestopping products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening and joint configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
   1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
   2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form release agents from concrete.

B. Priming: Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping's seal with substrates.

3.4 INSTALLATION/GENERAL

A. The Contractor must select the material and UL test assemblies to be used as may be required for each type of material, location, rating and penetration or hole size. Do not proceed with the work until all submittals have been fully approved.

B. Materials and equipment must be as approved by the manufacturer. Application procedures must be in strict accordance with the manufacturer's directions and specifications. Only experienced, skilled mechanics approved by the materials manufacturers must be allowed to place the materials.

C. Provide firestopping materials and thicknesses as required to provide indicated ratings. Where not otherwise indicated, comply with U.L. standard designs. In multiple layer work, offset joints by at least 6 inches.

D. Anchor firestopping using manufacturers' recommended system and in compliance with U.L. standard designs.

E. Install firestopping without gaps and voids of any kind. Do not use damaged materials. Remove and replace nonfitting or disturbed work. Do not use fire safing materials containing solvents.

3.5 INSTALLING THROUGH-PENETRATION FIRESTOPS

A. General: Comply with the "System Performance Requirements" article in Part 1 and the through-penetration firestop manufacturer's installation instructions and Drawings pertaining to products and applications indicated.

B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:
1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
4. Provide 20 gage minimum metal plates where required for fire safing support to comply with fire rating.
5. For mineral safing insulation, apply in continuous length using manufacturer's standard safing clips compress insulation until stable without movement.

3.6 INSTALLING FIRE-RESISTIVE JOINT SEALANTS

A. General: Comply with the "System Performance Requirements" article in Part 1, with ASTM C 1193, and with the sealant manufacturer's installation instructions and Drawings pertaining to products and applications indicated.

B. Install fire resistive joint fillers to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.

C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint width that optimum sealant movement capability. Install sealants at the same time joint fillers are installed.

D. Tool non-sag sealants immediately after sealant application and prior to the time skinning or curing begins. Form smooth, uniform beads of configuration indicated or required to produce fire-resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.7 FIELD QUALITY CONTROL

A. A qualified Inspecting agency performing controlled inspections will be employed and paid by the Contractor and will examine completed firestopping to determine, in general, if it is being installed in compliance with requirements.

B. Inspecting agency will report observations promptly and in writing to the Contractor and Commissioner.

C. Do not proceed to enclose firestopping with other construction until reports of examinations are issued.

D. Where deficiencies are found, repair or replace firestopping so that it complies with requirements.

3.8 CLEANING

A. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

B. Protect firestopping during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they 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 firestopping immediately and install new materials to produce firestopping complying with specified requirements.

END OF SECTION 07 84 00

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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. Work Included: Provide products in accordance with the Contract Documents. The Work of this Section will include but not be limited to the following:
   1. Joint sealant assemblies in horizontal and vertical surfaces.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit manufacturer's technical data for each product required, including instructions for preparation and application.
   1. Certification by firestopping manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs) and are nontoxic to building occupants.

C. Samples: Submit manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available.

D. Submit product specifications and material data (MSD) safety sheets for each product.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”

B. Installer Qualifications: Engage an experienced firm that has recently completed Joint Sealer projects similar in cost, material, design and extent to that indicated by this section and whose work has resulted in construction with a record of successful in-service performance.

C. Source for Materials: Obtain joint sealer materials from a single manufacturer for each different product.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original unopened containers with labels indicating manufacturer, expiration date, and other pertinent data.

B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Conditions: Do not install joint sealers when air and surface temperatures are outside the limits permitted by joint sealer manufacturer, or when joint substrates are wet or dirty.

B. Joint Widths: Do not proceed with installation of joint sealers when joint widths are not as allowed by joint sealer manufacturer.

1.7 EXTENDED WARRANTY

A. Submit a manufacturer's warranty to repair or replace defective joint sealer materials or workmanship; including staining, loss of adhesion, loss of cohesion, cracking or discoloration, for a period of 5 years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Dow Corning
2. General Electric Co.
3. Pecora Corp.
4. Tremco, Inc.
5. Or approved equal.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealers, joint fillers and related materials that are compatible with one another and with joint substrates, as demonstrated by testing and field experience.

B. Colors: Provide colors of joint sealers as selected by the Commissioner.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealant Standard: Comply with ASTM C 920.

B. One-Part Mildew-Resistant Silicone Sealant: Type S; Grade NS; Class 25; Uses: Non-traffic, formulated with fungicide for sealing interior joints with nonporous substrates at vertical surfaces of ceramic tile in toilets, kitchens and between plumbing fixtures and tile.
1. Products: Subject to compliance with requirements, provide one of the following mildew-resistant sealants.
a. "Dow Corning 786"; Dow Corning Corp.
b. "SCS 1702"; General Electric Co.
c. "863 #345 White"; Pecora Corp.
d. "Proglaze White"; Tremco, Inc.
e. Or approved equal

2.4 LATEX JOINT SEALANTS

A. Acrylic-Emulsion Sealant: One part, nonsag sealant complying with ASTM C 834, paintable and recommended for interior applications with joint movement of not more than plus or minus 5 percent. Subject to compliance with requirements, provide products by one of the following:
1. "Chem-Calk 600"; Bostik Construction Products Div.
2. "AC-20"; Pecora Corp.
3. "Tremco Acrylic Latex 834"; Tremco, Inc.
4. Or approved equal

2.5 NON-ELASTOMERIC SEALANT

A. Acrylic-Emulsion Sealant: Provide acrylic-emulsion or latex-rubber-modified acrylic-emulsion sealant compound complying with ASTM C 834, permanently flexible, nonstaining and nonbleeding; recommended by manufacturer for protected exterior exposure and general interior exposure. Subject to compliance with requirements, provide one of the following:
1. Acrylic Latex Caulk, Tremco Inc.
2. AC-20 Acrylic Latex, Pecora
3. Igas Calking-L, Sika Chemical Corp.
4. Or approved equal

B. Additional performance requirements for sealants supplied under paragraph A above are as follows:
1. Adhesive strength to aluminum: 12 psi min.
2. % total solids: minimum of 95% after 7 days at 75 degrees F.
3. Pot life: 6 hours at 75 degrees F. minimum.

2.6 JOINT SEALANT BACKING

A. General: Provide backings which are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer.

B. Plastic Foam Joint-Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape and density to control sealant depth.
1. Either flexible, open cell polyurethane foam or non-gassing, closed-cell polyethylene foam, unless otherwise indicated.

C. Tubing Joint-Fillers: Neoprene, EPDM or silicone tubing complying with ASTM D 1056, non-absorbent to water and gas, resilient at temperatures down to -26 deg F., of size and shape to provide a secondary seal.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape to prevent bond between sealant and materials at back of joint. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates, as determined from preconstruction joint sealer-substrate and field tests.

B. Cleaners: Provide non-staining cleaner of type acceptable to manufacturer of sealant and sealant backing materials.

C. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements

3.2 INSPECTION

A. Inspect joints to receive joint sealers for compliance with requirements. Report conditions detrimental to joint sealer work. Proceed after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:
   1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including water.
   2. Clean porous joint substrate surfaces to produce a clean, sound substrate. Remove loose particles remaining from cleaning.
   3. Remove laitance and form release agents from concrete.
   4. Clean non-porous surfaces with cleaners which are not harmful to substrates or leave residues that may affect joint sealers.

B. Joint Priming: Prime joint substrates to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond; not on adjoining surfaces.

C. Masking Tape: Mask adjoining surfaces which might be permanently stained or damaged by sealant or by cleaning required to remove sealant. Remove tape immediately after tooling without disturbing joint.

3.4 INSTALLATION OF JOINT SEALERS

A. General: Comply with joint sealer manufacturers' printed installation instructions, except where more stringent requirements apply.

B. Elastomeric Sealant Installation Standard: Comply with ASTM C 962 for use of joint sealants as applicable to conditions indicated.

C. Installation of Sealant Backings: Install sealant backings to produce the shapes and depths of sealants for optimum performance.
   1. Do not leave gaps between ends of joint-fillers.
   2. Do not stretch, twist, puncture or tear joint-fillers.

3. Do not use absorbent joint-fillers which are wet.
4. Install bond breaker tape where required to prevent third-side adhesion of sealant to back of joint.
5. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.

D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting joint substrates, completely filling joints and providing uniform, cross-sectional shapes and depths for optimum sealant movement. Mask adjacent surfaces if necessary.

E. Tooling of Non-sag Sealants: Tool sealants to form smooth, uniform beads to eliminate air pockets and to ensure adhesion of sealant with sides of joint. Remove excess sealants from adjacent surfaces. Provide concave joint configuration per Figure 6A in ASTM C 962.

F. Installation of Preformed Foam Sealants: Comply with manufacturer's directions, to produce seal continuity at ends, turns, and joints.

G. Installation of Fire-Stopping Sealant: Install sealant and accessory materials to fill openings penetrating floors and walls to provide fire-stops with required fire resistance ratings.

3.5 CLEANING

A. Clean off excess sealants or sealant smears as work progresses by methods and materials approved by manufacturers of joint sealers. Remove masking tape when no longer required.

3.6 PROTECTION

A. Protect joint sealers from contamination or damage, so that they are without deterioration or damage at time of Substantial Completion.

B. Remove damaged or defective joint sealers and reseal joints to match original work.

END OF SECTION 07 92 00

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SECTION 08 31 00 - ACCESS DOORS AND PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Work Included: Provide products in accordance with the Contract Documents. All access panels and doors for mechanical, ventilation, plumbing and electrical work to be coordinated with other trades. The Work of this Section will include but not be limited to the following:
   1. Wall and ceiling access doors.
   2. Fire-rated wall and ceiling access doors.

B. Related Sections:
   1. Section 04 20 00 - Unit Masonry
   2. Section 09 21 00 - Gypsum Drywall Systems
   3. Section 09 90 00 - Painting and Coating
   4. Division 23 - Mechanical.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product data for each type of access door assembly specified, including details of construction relative to materials, individual components, profiles, finishes, and fire-protection ratings (if required).
   1. Include complete schedule, including types, general locations, sizes, wall and ceiling construction details, latching or locking provisions, and other data pertinent to installation.

C. Shop Drawings showing fabrication and installation of access doors and frames, including details of each frame type, elevations of door design types, anchorage, and accessory items.

D. Samples, 3-inch by 5-inch minimum size, of each panel face material showing factory-finished color and texture.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Single-Source Responsibility: Obtain access doors for entire Project from one source and by a single manufacturer.

C. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per test method as indicated below, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency.
   1. Test Method for Vertical Installations: ASTM E 152.
   2. Test Method for Horizontal Installations: ASTM E 119.

D. Size Variations: Obtain Commissioner's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.

1.5 COORDINATION

A. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed equipment, and indicate on schedule specified under "Submittals" Article.
   1. Coordinate installation of access doors to minimize the need for other trades to cut or remove work.
   2. Where possible access panels must be concealed from view. Coordinate locations and install as directed by the Commissioner.

1.6 DEFINITIONS

A. General: Where access doors are to be provided in wet locations, note, wet locations are any area that has running water, including but not limited to toilet rooms, mechanical rooms and chases.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. J.L. Industries.
   2. Karp Associates, Inc.
   3. Larsen's Manufacturing Co.
   4. Bilco.
   5. Or approved equal.

2.2 MATERIALS

A. Steel Sheet: ASTM A 366/A 366M commercial-quality, cold-rolled steel sheet with baked-on, rust-inhibitive primer.

B. Stainless-Steel Sheet: At wet locations provide, ASTM A 167, Type 304 with No. 4 finish according to ASTM A 480/A 480M.

C. Aluminum Extrusions: ASTM B 221, 6063-T6.

D. Plate and Steel: ASTM B 209, 6061-T6.

2.3 ACCESS DOORS

A. Noninsulated, Fire-Rated Doors for Walls: Self-latching units consisting of frame, concealed trim, door, and hardware, including automatic closer, interior latch release, and complying with the following requirements:
   1. Frame: 0.0598-inch thick steel sheet.
   2. Frame for Wet Areas: 0.0625-inch thick stainless-steel sheet.
   3. Door: 0.0598-inch thick steel sheet.
   4. Door for Wet Areas: 0.0625-inch- thick stainless-steel sheet.
   5. Hinge: Continuous type.
   6. Latches: Bolt type, operated by ring turn device.
   7. Fire-Protection Rating for Walls: 1-1/2 hours.

B. Trimless, Flush Access Doors for Gypsum Board: Units consisting of frame, concealed edge trim, door, hardware, and complying with the following requirements:
   1. Frame: 0.0598-inch thick steel sheet.
   2. Frame for Wet Locations: 0.0625-inch- thick stainless-steel sheet.
   3. Door: 0.0747 inch thick steel sheet.
   4. Door for Wet Locations: 0.0781 inch thick stainless-steel sheet.
   5. Concealed, Gypsum Board Edge Trim: 0.0299 inch zinc-coated or galvanized-steel sheet with face flange formed to receive joint compound.
   6. Hinge: Concealed spring pin or continuous type.
   7. Locks: Flush, screwdriver-operated cam.

C. Recessed Doors where indicated: Units consisting of frame with no exposed trim, recessed door to receive tile, hardware, and complying with the following requirements:
   1. Frame: 0.0897 inch thick steel sheet.
   2. Door: 0.0598 inch thick steel sheet, recessed 1 inch.
   3. Frame for Wet Locations: 0.0625 inch thick stainless-steel sheet.
   4. Door for Wet Locations: 0.0781 inch thick stainless-steel sheet.
   5. Hinge: Concealed, pivoting-rod type.
   6. Locks: Flush, screwdriver-operated cam.

2.4 FABRICATION

A. General: Manufacture each access door assembly as an integral unit ready for installation.

B. Steel Access Doors and Frames: Continuous welded construction. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.
   1. Exposed Flange: Nominal 1 to 1-1/2 inches (25.4 to 38.1 mm) wide around perimeter of frame.
   2. For gypsum board assemblies or gypsum veneer plaster, furnish frames with edge trim for gypsum board or gypsum base.
   3. For installation in masonry construction, furnish frames with adjustable metal masonry anchors.

C. Recessed Panel Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling.

D. Locking Devices: Furnish number required to hold door in flush, smooth plane when closed.
   1. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

E. Finish: Provide units factory primed for finish painting unless otherwise indicated.
   1. Provide directional satin finish for stainless steel units or as selected by the Commissioner.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Advise Installers of other work about specific requirements relating to access door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices. Furnish inserts and anchoring devices for access doors that must be built into other construction. Coordinate delivery with other work to avoid delay.

3.3 INSTALLATION

A. Comply with manufacturer's instructions for installing access doors.

B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finished surfaces.

C. Install concealed-frame access doors flush with adjacent finish surfaces.

3.4 ADJUST AND CLEAN

A. Adjust hardware and panels after installation for proper operation.

B. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.

END OF SECTION 08 31 00

SECTION 09 21 00 - GYPSUM DRYWALL 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. Work Included: Provide products in accordance with the Contract Documents. The Work of this Section will include but not be limited to the following:
   1. Gypsum drywall panels, including screw-type metal framing support system.
   2. Drywall finishing with joint tape-and-compound.
   3. Cementitious backerboards.
   4. Metal supports and backer plates for other finishes.
   5. Acoustical insulation and sealant for drywall.
   6. Metal fabrications and accessories.

B. Related Sections:
   1. Section 07 84 00 - Firestopping
   2. Section 07 92 00 - Joint Sealants
   3. Section 08 31 00 - Access Doors and Panels
   4. Section 09 90 00 - Painting and Coating

1.3 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Fire-Resistance Rating: Where ratings are indicated, match applicable assemblies tested per ASTM E119 by fire testing laboratories, or to design designations in UL "Fire Resistance Directory" or in listing of other testing agencies.

C. Gypsum Board Terminology Standard: GA-505 by Gypsum Association.

D. Installer: Engage an experienced firm that has recently completed Gypsum Drywall System assemblies with Fire-Resistant Ratings similar in cost, material, design and extent to that indicated by this work which has resulted in construction with a record of successful in-service performance.

E. Single Source Responsibility: Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.

1.4 PERFORMANCE REQUIREMENTS

A. Sound Transmission Characteristics: For gypsum drywall assemblies indicated to have STC ratings, provide materials and construction identical to those of assemblies whose STC ratings were determined per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing agency.

B. Sound-Attenuation Performance: For gypsum board shaft-wall assemblies, provide materials and construction identical to those of assemblies whose STC ratings were determined per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing agency.
   1. STC Rating: 47 Min. unless otherwise indicated for each partition type.

C. General: All systems must conform to requirements of the current Code for the seismic hazard group required and all applicable modifications as required by the building code and amendments as required.

D. Hanger Anchorage Devices: Provide devices appropriate for anchorage to the structure whose suitability has been proven through standard construction practices and certified test data, and as follows:
   1. General: Size devices to develop full strength of hanger but not less than 3 times calculated hanger loading, except size direct pull-out concrete inserts for 5 times the calculated hanger loading.
   2. Concrete Slabs - 4" Minimum: Provide drilled expansion type anchors of size to suit the load.

E. Field Evaluation and Testing: Provide pull-out tests by a qualified testing agency subject to the approval of the Commissioner, on a selected anchor section. Include all proposed components for anchoring to existing slabs, provide tests in accordance with ASTM E 488. Tests must evaluate design, and safety factor loading and must not test beyond design and safety factor loading to failure, unless otherwise indicated approved and required.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit manufacturer's specifications and installation instructions for gypsum drywall and gypsum sheathing. Submit other data as required to show compliance with these specifications.

C. Samples: Submit 12" long samples of each type of trim accessory.

D. Shop Drawings: Submit Show Drawings showing locations of control joints.

E. Test Reports: The Contractor must submit test report, obtained by drywall manufacturer, indicating conformance of drywall assemblies to fire ratings and sound ratings as indicated on contract drawings.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, sunlight, soiling, dirt or other causes. Neatly stack gypsum boards flat to prevent sagging.

C. Handle gypsum boards to prevent damage to edges, ends or surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.7 PROJECT CONDITIONS

A. Environmental Requirements: Comply with referenced standards and recommendations of gypsum board manufacturer, for environmental conditions before, during and after application of gypsum board.

B. Cold Weather Protection: When air temperature is below 55 deg F maintain temperature of not less than 55 deg F for at least 48 hours before, during and after application of joint treatment materials.

C. Ventilation: Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Metal Support Materials:
   a. Dale Industries, Inc.
   b. Marino Industries.
   c. United States Gypsum Co.
   d. Or approved equal.
2. Gypsum Board and Related Products:
   a. Georgia-Pacific Cor
   b. Gold Bond Building Products Div., National Gypsum Co.
   c. United States Gypsum Co.
   d. Or approved equal.
3. Cementitious Backer Board:
   a. United States Gypsum Co.
   b. Custom Building Products.
   c. Domtar Gypsum.
   d. Or approved equal.
4. Grid Suspension Systems:
   a. Chicago Metallic Corp.
   b. Armstrong Co.
   c. United States Gypsum Co.
   d. Or approved equal.
5. Furring Member: “C” Shaped Studs:
   a. Gold Bond Building Products.
   b. Domtar Gypsum Co.
   c. Georgia Pacific Corp.
   d. Or approved equal.

2.2 CEILING SUPPORTS

A. General: Provide metal suspension systems of type, structural classification and finish indicated which comply with applicable ASTM C 754 requirements and the requirements of the New York City Building Code.

B. Hangers: Mild steel rods or flats with zinc-coating or rust-inhibitive primer paint, sizes as indicated.

C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.

D. Hanger Anchorage Devices: Devices whose suitability for use has been proven by standard construction practices or by certified test data. Size devices for 3x load, as determined by ASTM E 488.

E. Main Runners: 1-1/2" cold rolled, 475 lbs. per 1000 ft. channel, painted.

F. Furring Members: ASTM C 645; 0.0179" minimum thickness, hat-shaped; "C"-shaped studs for spans of more than 4 feet.

G. Furring Anchorages: 16-gage galvanized wire ties, clips and anchorages recommended by furring manufacturer.

H. Grid Suspension System: ASTM C 645, manufacturer's standard grid suspension system composed of main beams and cross furring members which interlock to form a modular supporting network.

I. Carry Channel Members: ASTM C 645; 0.0179" minimum thickness, hat-shaped; "C"-shaped studs for spans of more than 4 feet.

2.3 WALL AND PARTITION FRAMING

A. Studs: ASTM C 645; of profile, size and base metal thickness required to produce assemblies complying with structural performance requirements of ASTM C 754 under required deflection and lateral loading conditions.
   1. Depth of Section: Standard sizes as shown.
   2. Gauge: Provide Gauge as indicated.
      a. Provide non-standard profiles and gauges for use in installations where required.
   3. Runners: Match studs, type as recommended by stud manufacturer.

B. Furring Members: ASTM C 645; 0.0179" minimum thickness (25 gage) of base metal, hat-shaped, except "Z"-furring members.

C. Z-Furring Members: Standard screw-type galvanized steel, "Z"-shaped furring members complying with ASTM A 525, G60, 0.0179" min. thickness (25 gage); of depth to suit insulation thickness indicated.

D. Steel Resilient Furring Channels: Manufacturer's standard product designed to reduce sound transmission, complying with ASTM C 645 for base metal, finish and widths of face and fastening flange, fabricated to form ½ inch deep channel of the following configuration:
   1. Single-Leg Configuration: Asymmetric-shaped channel with face connected to one flange by a slotted leg.

E. Flat Reinforcing Strips: 14 gauge by 8" wide minimum (unless otherwise noted) galvanized strip for wall mounted items and accessories such as handrails, grab bars, wall mounted shelving, cabinets, and counters.

F. Fasteners for Furring Members: Type and size recommended by furring manufacturer for the indicated substrates.

2.4 GYPSUM BOARD

A. Gypsum Wallboard: ASTM C 36, of types and edge profile indicated; in maximum lengths available, 5/8" thick unless otherwise indicated.
1. Type: Regular, unless otherwise indicated.
2. Type: Type X for fire-resistant rated assemblies.
3. Edges: Tapered.
4. Provide sag resistant type for ceiling surfaces.

B. Water-Resistant Backing Board: ASTM C 630, of type indicated; in maximum lengths available; 5/8" thick unless otherwise indicated.
1. Type: Regular, unless otherwise indicated.
2. Type: Type X for fire-resistant rated assemblies.

2.5 CEMENTITIOUS BACKER UNITS

A. Provide cementitious backer units complying with ANSI A118.9, of thickness and width as indicated, and in maximum lengths available to minimize end-to-end butt joints.

B. Products: Subject to compliance with requirements, provide one of the following products:
1. The Original Wonderboard; Custom Building Products.
2. DomCrete Cementitious Tile-Backer Board; Domtar Gypsum.
3. DUROCK Cement Board; United States Gypsum Co.
4. Or approved equal.

2.6 TRIM ACCESSORIES

A. General: ASTM C 1047; standard trim accessories of types required for drywall work, formed of galvanized steel and beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge trim-beads, U-type edge trim-beads, and one-piece control joint beads.

B. Accessory for Curved Edges: Cornerbead formed of metal, plastic, or metal combined with plastic, with either notched or flexible flanges that are bendable to curvature radius.
1. Product: Rip casing bead, PVC tear away L bead as manufactured by Trim Tex (size as required), Amico, Placar or approved equal.

2.7 JOINT TREATMENT MATERIALS

A. General: Provide materials comply with ASTM C 475; and recommendations of manufacturer of both gypsum board and joint treatment for the application indicated.

B. Joint Tape: Paper reinforcing tape, unless otherwise indicated.

C. Joint Compound: Ready-mixed vinyl-type for interior use. Provide 2 separate grades; one specifically for bedding tapes and filling depressions, and one for topping and sanding.

D. Water-Resistant Joint Compound: Water-resistant type for joints, fastener heads and cut edges of water-resistant backing board.

2.8 ACOUSTICAL SEALANT

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:
   1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

B. Acoustical Sealant for Concealed Joints: Manufacturer's standard nondrying, nonhardening, nonstinging, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

C. Exposed Acoustical Sealant: Nonoxidizing, skinnable, paintable, gunnable sealant for exposed applications per ASTM C 919.
   1. Acoustical Sealant for Exposed and Concealed Joints:
      a. PL Acoustical Sealant; ChemRex, Inc.; Contech Brands.
      b. AC-20 FTR Acoustical and Insulation Sealant; Pecora Corp.
      c. Miracle Adhesives/Pratt & Lambart SCS-21/SCS-180.
      d. Phenoseal “Surpass”.
      e. Or approved equal
   2. Acoustical Sealant for Concealed Joints:
      a. BA-98; Pecora Corp.
      b. Tremco Acoustical Sealant; Tremco, Inc.
      c. GE RCS 20; GE Sealants.
      d. Or approved equal

D. Acoustical Insulation: ASTM C 665, Type I; mineral fiber blanket without membrane, Class 25 flame-spread, minimum thickness must be 2-1/2 inches or as required to meet STC ratings.
   1. Mineral Fiber Type: Fibers manufactured from glass.
   2. Insulation must meet New York City Building Code requirements.

2.9 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum drywall construction which comply with referenced standards and the recommendations of the manufacturer of the gypsum board.

B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum boards.

C. Spot Grout: ASTM C 475, setting-type joint compound of type recommended for spot grouting hollow metal door frames.

D. Fastening Adhesive for Metal: Special adhesive recommended for laminating gypsum boards to steel framing.

E. Gypsum Board Screws: Comply with ASTM C 1002.

F. Foam Gaskets and Strips: Closed-cell vinyl foam adhesive-backed strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit metal stud size indicated.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates to which drywall construction attaches or abuts, preset hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of drywall construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Ceiling Anchorages: Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure that inserts and other structural anchorage provisions have been installed to receive ceiling anchors in a manner that will develop their full strength and at spacing required to support ceiling.
   1. Furnish concrete inserts and other devices indicated, to other trades for installation well in advance of time needed for coordination with other construction.
   2. Coordinate installation of work attached to areas to receive spray-fireproofing install ceiling anchors, offset anchors and plates prior to work.
   3. Clean hangers and accessories after installation of fireproofing as required.

B. Firestopping: Coordinate installation of firestopping with installation of gypsum wall systems so there will not be any conflict in schedule or delay.

3.4 INSTALLATION OF FRAMING, GENERAL

A. Installation Standard: Comply with ASTM C 754 and ASTM C 840. Provide support for all edges of gypsum board.

B. Install supplementary backing plates, framing, blocking and bracing at terminations in the work and for support of toilet accessories and other similar construction.
   1. Where handrails, grab bars, crash rails, coat hooks, shelving, and the like are attached to drywall, unless other sizes are indicated, provide a 16 gage 8" wide galvanized steel strip behind gypsum board and between studs securely fastened to studs.
   2. For shelving install 16 gauge 8" high metal attachment plates at 4", 1'-9", and 5'-9" aff. to centerline of plates.
   3. For accessible grab bars, provide where indicated.

C. Isolate steel framing from building structure to prevent transfer of structural loading, at locations indicated below.
   1. Where edges of suspended ceilings abut building structure.
   2. Where partition and wall framing abuts overhead structure.
   3. Provide slip- or cushioned-type joints as detailed to attain lateral support and avoid axial loading

D. Do not bridge building expansion joints with support system, frame both sides of joints with furring and other support as indicated.

3.5 CEILING SUPPORT SYSTEMS

A. Secure hangers directly to structure where possible, otherwise connect to inserts, clips or other anchorage devices or fasteners as per N.Y.C. Code requirements.

B. Space carrying channels 4'-0" o.c. and space hangers 4'-0" o.c. at runners.

C. Level carrying channels to a tolerance of 1/8" in 12'-0", measured both lengthwise on each runner and transversely between parallel runners.

D. Wire-tie or clip furring members to supports.

E. Space ceiling furring members 16" o.c.

F. Provide sufficient supplementary framing and hangers for runner channels on each side of light fixtures, ceiling diffusers and grilles, access panels and other items penetrating the ceiling.

3.6 WALL AND PARTITION FRAMING

A. Install runner tracks at floors, ceilings and structural walls and columns where gypsum drywall stud system abuts other work. At exterior walls, install asphalt felt strips between wall and framing.

B. Extend partition stud system through ceilings to the structural support above the ceiling, unless otherwise indicated.

C. Space studs 16" o.c., unless otherwise indicated.

D. Frame door openings to comply with recommendations of gypsum board manufacturer, or with "Gypsum Construction Handbook" by United States Gypsum Co. Screw studs to jambs of door frames; install runner track at head of frame and secure to jamb studs.
   1. Extend vertical jamb studs through suspended ceilings and attach to underside of structure above. Brace studs where required.

E. Frame openings, other than door openings, in same manner as required for door openings; and install framing below sills of openings to match framing above door heads.

F. Space wall furring members 16" o.c. unless otherwise shown.

G. Install insulation between framing or furring members where indicated. Until gypsum board is installed, hold insulation with wire staples.

H. Install insulation between framing or furring members where indicated. Until gypsum board is installed, hold insulation with wire staple

3.7 GYPSUM BOARD APPLICATION AND FINISHING, GENERAL

A. Application and Finishing Standards: ASTM C 840.

B. Install acoustical insulation prior to gypsum board unless readily installed after board has been installed.
   1. Where S.T.C.-rated gypsum board assemblies are indicated or required, seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant including a bead at both faces of the partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

C. Locate exposed end-butt joints away from center of walls and ceilings, and stagger not less than 1'-0" in alternate courses. Install boards to form smooth curved surfaces where shown.

D. Install ceiling boards to minimize the number of end-butt joints, and to avoid end joints in the center of each ceiling. Stagger end joints at least 24".

E. Install wall and partition boards vertically to avoid end-butt joints wherever possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs.

F. In addition to partition types indicated to receive “MR” gypsum board, install moisture resistant gypsum board at all column returns and at heads and jambs for all windows and openings.

G. Install exposed gypsum board with face side out. Do not install defective or damp boards. Butt boards lightly together with not more than 1/16" space between boards. Do not force into place.

H. Locate edges and ends over supports or other solid backing. Position boards so that like edges abut, tapered edges against tapered edges and cut ends against cut ends. Stagger joints over different studs on opposite sides of partitions.

I. Provide framing for support at openings and cutouts.

J. Form control joints and expansion joints to receive trim accessories. Locate these joints to comply with manufacturer's instructions and not more than 30 ft. o.c. when not indicated on Drawings.

K. Cover both faces of partition framing with gypsum board in concealed spaces, except in chase walls which are braced internally.
   1. Except for sound or fire rated applications, scraps of not less than 8 sq. ft. area may be used where concealed.
   2. Fit gypsum board around ducts, pipes and conduit.

L. Isolate perimeter of non-load-bearing partitions from the structure. Provide 1/4" to 1/2" space and trim edge with J-type edge trim. Seal joints with acoustical sealant.

M. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations.

N. Spot grout hollow metal frames. Except where full grouting is required for fire-resistance rating, grout 6" lengths at each anchorage.

O. Install Cementitious backerboards as recommended by manufacturer.
   1. Finish backing board forming base for ceramic tile to comply manufacturer's directions for treatment of joints behind tile.

3.8 SINGLE-LAYER APPLICATION

A. On ceilings apply gypsum board prior to wall and partition board application to the greatest extent possible.

B. On partitions and walls apply gypsum board horizontally, and provide sheet lengths which will minimize end joints.

C. On Z-furring members apply gypsum board horizontally, (parallel) with no end joints. Locate edge joints over furring members

D. Single-Layer Fastening: Apply gypsum boards to supports with screws.

3.9 DOUBLE-LAYER APPLICATION

A. General: Install gypsum backing board for base layer and exposed gypsum board for face layer.

B. On ceilings apply base layer prior to base layer on walls; apply face layers in same sequence. Offset joints between layers at least 10". Apply base layers at right angles to supports.

C. On partitions and walls apply base layer and face layers horizontally (parallel) with joints of base layer over supports and face layer joints offset at least 10" with base layer joints.
   1. Provide triple layer installations and framing as indicated for Studio areas as indicated. Stagger joints if layers.

D. On Z-furring members apply base layer and face layer horizontally, with vertical joints offset at least one furring member. Locate edges of base layer over furring members.

E. Double-Layer Fastening: Screw base layers and face layers separately to supports.

3.10 INSTALLATION OF DRYWALL TRIM

A. General: Where feasible, use the same fasteners to anchor trim as required to fasten gypsum board. Fasten flanges of trim in accordance with manufacturer's instructions. Closely fit and align ends of trim.

B. Install metal corner beads at external corners of drywall work.

C. Install edge trim at exposed or semi-exposed edges of drywall. Install L-type trim where work abuts other work, and install kerf-type where other work is kerfed to receive trim. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled.

D. Install semi-finishing trim where trim flanges are not to be covered with joint compound.

E. Install metal control joints (beaded-type) where indicated.

3.11 FINISHING OF DRYWALL

A. General: Treat gypsum board joints, trim accessories, penetrations, fastener heads, surface defects and elsewhere as required for applied finishes. Prefill open joints using proper compound.
   1. Apply joint tape between gypsum boards, except at trim.
   2. Apply joint compound in 3 coats, not including prefill in joints, and sand between last 2 coats and after last coat.

   Skim coat all wall applications unless otherwise indicated.

B. Water-Resistant and Tile Backer Board: Treat joints and fasteners to comply with directions of backer board and water-resistant joint compound manufacturer, using water-resistant joint compound. Do not crown the joints. Embed tape in joints and form true angles.

C. Partial Finishing: Omit third coat and sanding on concealed drywall work which requires finishing to achieve fire-resistance rating, sound rating, or to act as an air or smoke barrier.

3.12 PROTECTION OF WORK

A. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall work being without damage or deterioration at time of substantial completion.

END OF SECTION 09 21 00

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SECTION 09 21 16.23 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. This Section includes gypsum board shaft-wall assemblies for the following:
   1. Shaft-wall enclosures.
   2. Chase enclosures.
   3. Stair enclosures.
   4. Horizontal enclosures.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: For each gypsum board shaft-wall assembly indicated.

C. Fire-Resistance Ratings: Provide materials and construction identical to those of assemblies with fire-resistance ratings determined according to ASTM E 119 by a testing and inspecting agency.

D. STC-Rated Assemblies: Provide materials and construction identical to those of assemblies tested according to ASTM E 90 and classified according to ASTM E 413 by a testing and inspecting agency.

E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in the DDC General Conditions Section "Project Management and Coordination." Review methods and procedures for installing gypsum board shaft-wall assemblies including, but not limited to, the following:
   1. Fasteners proposed for anchoring nonstructural steel framing to building structure.
   2. Sprayed fire-resistive materials applied to structural steel framing.
   3. Elevator equipment, including hoistway doors, elevator call buttons, and elevator floor indicators.
   4. Wiring devices in shaft-wall assemblies.
   5. Doors and other items penetrating shaft-wall assemblies.
   6. Items supported by shaft-wall-assembly framing.
   7. Mechanical work enclosed within shaft-wall assemblies.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.

B. 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.

C. Stack panels flat on leveled supports off floor or slab to prevent sagging.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or with gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, or mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Georgia-Pacific Corp.
   2. United States Gypsum Co.
   3. National Gypsum Co, Gold Bond Building Products
   4. Or approved equal

2.2 GYPSUM BOARD SHAFT-WALL ASSEMBLIES, GENERAL

A. Provide materials and components complying with requirements of fire-resistance-rated assemblies indicated.
   1. Provide panels in maximum lengths available to eliminate or minimize end-to-end butt joints.
   2. Provide auxiliary materials complying with gypsum board shaft-wall assembly manufacturer's written recommendations.

2.3 PANEL PRODUCTS

A. Gypsum Liner Panels: Comply with ASTM C 442/C 442M. Proprietary liner panels as required for the specific fire-resistant-rated gypsum board shaft-wall assemblies indicated, with moisture-resistant paper facings.

B. Gypsum Board: As specified in Section 09 21 00 "Gypsum Drywall Systems."

C. Water-Resistant Gypsum Backing Board: As specified in Section 09 21 00 "Gypsum Drywall Systems."

2.4 NON-LOAD-BEARING STEEL FRAMING

A. Framing Members: Comply with ASTM C 754 for conditions indicated.

B. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.

2.5 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced product standards and manufacturer's written recommendations.

B. Trim Accessories: Cornerbead, edge trim, and control joints of material and shapes specified in Section 09 21 00 “Gypsum Drywall Systems" that comply with gypsum board shaft-wall assembly manufacturer's written recommendations for application indicated.

C. Gypsum Board Joint-Treatment Materials: As specified in Section 09 21 00 "Gypsum Drywall Systems".

D. Laminating Adhesive: Adhesive or joint compound recommended by manufacturer for directly adhering gypsum face-layer panels to backing-layer panels in multilayer construction.
1. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

E. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
1. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

F. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft-wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
1. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.
2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

G. 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.
1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

H. Acoustical Sealant: As specified in Section 07 92 00 "Joint Sealers".

2.6 GYPSUM BOARD SHAFT-WALL ASSEMBLIES

A. Basis-of-Design Product: Provide as indicated on drawings by design designation UL415 System B or provide approved equivalent rated assembly UL415 System D, UL System C or UL System F or approved equal.

B. STC Rating: As indicated**.**

C. Studs: Manufacturer's standard profile for repetitive members, corner and end members, and fire-resistance-rated assembly indicated.

D. Runner Tracks: Manufacturer's standard J-profile track with long-leg length as standard with manufacturer, but at least 2 inches long and in depth matching studs.
   1. Minimum Base-Metal Thickness: As indicated and/or matching steel studs.

E. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

F. Jamb Struts: Manufacturer's standard J-profile strut with long-leg length of 3 inches, in depth matching studs, and not less than 0.0329 inch thick.

G. Room-Side Finish: As indicated.

H. Shaft-Side Finish: As indicated by fire-resistance-rated assembly design designation.

I. Insulation: Sound attenuation blankets to be unfaced mineral-fiber blanket insulation as standard with gypsum board shaft-wall assembly manufacturer.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates to which gypsum board shaft-wall assemblies attach or abut, with Installer present, including hollow-metal frames, elevator hoistway door frames, cast-in anchors, and structural framing. Examine for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Sprayed Fire-Resistive Materials: Coordinate with gypsum board shaft-wall assemblies so both elements of Work remain complete and undamaged. Patch or replace sprayed fire-resistive materials removed or damaged during installation of shaft-wall assemblies.
   1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runner tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.

B. After sprayed fire-resistive materials are applied, remove only to extent necessary for installation of gypsum board shaft-wall assemblies and without reducing the fire-resistive material thickness below that which is required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

3.4 INSTALLATION

A. General: Install gypsum board shaft-wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and the following:
   1. ASTM C 754 for installing steel framing except comply with framing spacing indicated.
   2. Section 09 21 00 “Gypsum Drywall Systems” for applying and finishing gypsum wallboard.

B. Do not bridge architectural or building expansion joints with shaft-wall assemblies; frame both sides of expansion joints with furring and other support.

C. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.
   1. At elevator hoistway entrance door frames, provide jamb struts on each side of door frame.
   2. Where handrails directly attach to gypsum board shaft-wall assemblies, provide galvanized steel reinforcing strip with 0.0312-inch minimum thick x 4 inch wide galvanized steel reinforcement strip, accurately positioned and secured behind not less than 1 gypsum board face layer of ½ inch or 5/8 inch thickness.

D. Integrate stair hanger rods with gypsum board shaft-wall assemblies by locating cavity of assemblies where required to enclose rods.

E. At penetrations in shaft wall, maintain fire-resistance rating of shaft-wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.

F. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels, while maintaining continuity of fire-rated construction.

G. Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly. Install acoustical sealant to withstand dislocation by air-pressure differential between shaft and external spaces; maintain an airtight and smoke-tight seal; and comply with ASTM C 919 requirements or with manufacturer's written instructions, whichever are more stringent.

H. In elevator shafts where gypsum board shaft-wall assemblies cannot be positioned within 2 inches of the shaft face of structural beams, floor edges, and similar projections into shaft, install 1/2- or 5/8-inch thick, gypsum board cants covering tops of projections. No recesses allowed (at steel beams especially).
   1. Slope cant panels at least 75 degrees from horizontal. Set base edge of panels in adhesive and secure top edges to shaft walls at 24 inches o.c. with screws fastened to shaft-wall framing.
   2. Where steel framing is required to support gypsum board cants, install framing at 24 inches o.c. and extend studs from the projection to shaft-wall framing.

3.5 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period, in a manner acceptable at the time of Substantial Completion.

B. Remove and replace panels that are wet, moisture damaged, or mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 21 16

SECTION 09 51 00 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Work Included: Provide products in accordance with the Contract Documents. The Work of this Section will include but not be limited to the following:
   1. Acoustical ceilings.
   2. Indirect suspension system.
   3. Edge trim.

B. Related Sections:
   1. Section 09 21 00 - Gypsum Drywall Systems.
   2. Section 09 90 00 - Painting and Coating.
   3. Division 23 and 26 for Mechanical and Electrical work.

1.3 COORDINATION

A. Coordinate with all equipment, mechanical, electrical, and other trades affected by the work and resolve all discrepancies and conflicts in an approved manner.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Qualifications of Installer: Work under this Section must be performed by an experienced specialty installer who is regularly engaged in the type of work required herein.
   1. Installer must be properly trained by the manufacturer of both the suspension system and the acoustical units.
   2. Installer must be capable of producing the modifications of standard components as shown.

C. Flame Spread Rating: Acoustical ceiling panels must be classified by Underwriter's Laboratories, Inc., under hazard classification for a flame spread of 25 or under.

D. All suspended ceilings and suspension systems must be in accordance with the requirements of the New York City Building Code.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Manufacturer's Data: Manufacturer's product specifications and installation instructions for acoustical ceiling material, and for suspension system, including certified laboratory test reports and other data as required to show compliance with this Section.
   1. Indicate structural classification of suspension system.

C. Shop Drawings: Submit Show Drawing details and reflected ceiling plans of suspension systems and ceilings required by this Section. Show location of ceiling units and other items of general construction, equipment, mechanical and electrical work which are to be coordinated with the ceilings. Indicate framing and support details for work supported by the suspension system.

D. Samples:
   1. Acoustical Panels: Submit full size samples of each acoustic panel unit specified. Samples must show the full range of exposed color and texture to be expected in the completed work.
   2. Suspension System: Submit 12" long samples of each trim molding of suspension system.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Deliver all acoustical units and suspension system components in manufacturer's original unopened packages fully identified with type, finish, performance data and compliance labels.

B. Handle and store in accordance with manufacturer's instructions and recommendations. Store in a place protected from damage, exposure to the elements and high humidity.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Mineral Fiber Panel Ceilings
      a. Armstrong World Industries, Inc.
      b. Celotex Corporation.
      c. USG Interiors, Inc.
      d. Or approved equal.
   2. Indirect-Hung Suspension Systems and Edge Moldings
      a. Armstrong World Industries.
      b. USG Interiors, Inc.
      c. Celotex Corporation.
      d. Or approved equal.

2.2 ACOUSTIC PANELS

A. Water-Felted, Mineral-Base Acoustical Panels for Acoustical Panel Ceiling: Provide acoustical panels complying with the following:

1. Products: USG “Olympia Mars Clima Plus”, Armstrong “Optima”, CertainTeed “Symphony M” or approved equal.
2. Classification: Panels fitting ASTM E 1264 for Type III, mineral base with painted finish; Form 2, water felted.
3. Color: As selected by Commissioner.
4. Light Reflectance Coefficient: Not less than LR 0.80.
5. Noise Reduction Coefficient: NRC 0.50.
6. Ceiling Attenuation Class: Not less than CAC 35.
7. Edge Detail: Reveal sized to fit flange of exposed suspension system members.
8. Thickness: 5/8 inch.
9. Size: 24 by 24 inches.

2.3 SUSPENSION SYSTEM MATERIALS

A. Standard for Metal Suspension Systems: Provide metal suspension systems of type and finish indicated which comply with applicable ASTM C 635 requirements and New York City Building Code.
   1. Provide suspension systems acceptable to manufacturers of ceiling units.

B. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Indirect Hung.

C. Hangers: Wire hangers, 9 gauge, with paint or zinc coating.

D. Main Runners: Carrying channels fabricated from cold rolled steel with rust inhibitive paint finish. Size must be 1-1/2" deep, weighing 475 lbs/1000 l.f., for a hanger spacing of 4'-0" on center. Clips for attachment of hangers to carrying channels must comply with the seismic design requirements.

E. Coordination of Components: Provide suspension system which is coordinated with partitions, and which is coordinated with the indicated limitations and requirements for hanging from the structure and supporting equipment, light fixtures, HVAC components, and similar work indicated to be supported by or located in suspended ceilings. Include all necessary components for a complete system.

F. Exposed tee grid systems “Fineline DXF/DXLF” as manufactured by Donn-USG Interior Systems, “Interlude 9/16” by Armstrong, “9/16” Smoothline Bolt Slot” by CertainTeed or approved equal.
   1. Main and cross tees must be fabricated of cold-rolled steel, electro-zinc coated and factory painted to match color of tile; 9/16" exposed flange.
   2. Edge Molding: “Z” and “F” shaped, 9/16" reveal edge molding, finish to match grid, unless otherwise indicated.
   3. Maximum deflection: 1/360 span.

G. Support Clips: Manufacturer's standard support clips for securing tee grid to metal ceiling suspension system (runner bars).

2.4 MISCELLANEOUS MATERIALS

A. Acoustical Sealant: Resilient, non-staining, non-shrinking, non-hardening, non-skinning, non-drying, non-sag sealant intended for interior sealing of joints. Provide one of the following:
   1. BA-98; Pecora Corp.
   2. Tremco Acoustical Sealant; Tremco.
   3. GE RCS20; General Electric Sealants.

4. Or approved equal.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PRE-INSTALLATION CONFERENCE

A. Prior to the start of ceiling installation, meet at the Project Site with the installers of related work, including lighting, ductwork and similar work in the ceiling plenum. Review areas of potential interference and resolve conflicts before proceeding with the work. Coordinate ceiling layout with the layout of other work which penetrates or is supported by the ceiling.

3.3 ENVIRONMENTAL CONDITIONS

A. Space Enclosure: Do not install ceilings until wet work in the space has been completed and is nominally dry, and until work above ceilings has been completed, and until ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

3.4 INSPECTION AND PREPARATORY WORK

A. Examine metal ceiling suspension system previously installed by others and the conditions under which acoustical ceiling work is to be performed; remedy any unsatisfactory conditions.

3.5 INSTALLATION - GENERAL

A. Codes and Standards: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire resistance rating requirements where indicated, and industry standards applicable to the work.

B. Suspended Ceiling Installation: Comply with ASTM C-636 as applicable to acoustical panel ceilings, except to the extent more stringent requirements are indicated or required for compliance with governing regulations or fire resistance ratings.
   1. Provide supplementary framing and support members as required to support ceiling system where items of work do not permit standard hanger and support system.
   2. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of the supporting structure or of the ceiling suspension system.
   3. Splay hangers only where required, and if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.
   4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

5. Secure wire hangers to ceiling suspension members and to supports above with a minimum of 3 tight turns. Connect hangers either directly to structures or to inserts, eye screws, or other devices that are secure, that are appropriate for substrate, and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
6. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
7. Secure bracing wires to ceiling suspension members and to supports with a minimum of 4 tight turns.
8. Do not attach hangers to steel deck tabs.
9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise shown; and provide hangers not more than 8 inches from ends of each member.
11. No tile will be less than half a tile length.

C. Install edge moldings and reveal moldings of the type indicated at edges of acoustical panel ceiling areas, and at locations where edge of tile would otherwise be exposed after completion of the work.
1. Sealant Bed: Apply continuous ribbon or tape of acoustical sealant on back of vertical leg before fastening to vertical surface. Locate so that sealant will not be exposed after installation is completed.
2. Secure moldings to building construction by fastening through holes drilled in vertical leg. Space holes not more than 3" from each end and not more than 16" o.c. between end holes. Draw-up fasteners for tight set against vertical surfaces.
    a. Masonry or Concrete: Fasten with wood or machine screws into lead shield type anchors drilled into construction.
    b. Steel Stud: Fasten with toggle bolts, or similar self-expanding screw anchors.
3. Miter corners of moldings accurately to provide hairline joints.
4. Level moldings with ceiling suspension system, to a level tolerance of 1/8" in 12'-0".
5. All joints in moldings must be cut accurately and installed with tight neat joint; all corners must be mitered. Field applied tape and excess drywall compound must be removed from moldings immediately.
6. Provide perimeter tiles at half size at all times.

D. Install exposed spline acoustical panel systems in coordination with suspension system and according to ASTM C-636 "Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels".

3.6 CLEANING AND PROTECTION

A. Clean exposed surfaces of acoustical panels and edge moldings; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

B. Protect acoustical panel ceilings so that the work will be without damage and deterioration at the time of acceptance by the Commissioner.

END OF SECTION 09 51 00

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SECTION 09 90 00 - PAINTING AND COATING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Work Included: Provide products in accordance with the Contract Documents. The Work of this Section will include but not be limited to the following:
   1. Painting of interior exposed items and surfaces, except as otherwise indicated.
   2. Surface preparation, priming and coats of paint specified herein, are in addition to shop-priming specified under other sections of work.

B. Work Not Included:
   1. Factory and shop finished items, including shop priming of ferrous metal included under hollow metal work.
   2. Concealed surfaces.
   3. Operating parts.

C. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.3 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Coordination of Work: Review other sections of these specifications for prime paints, to ensure compatibility of total coatings system. Upon request from other trades, furnish information of finish materials to be used.

C. Qualifications: Engage an experienced firm that has recently completed interior Painting projects similar in cost, material, design and extent to that indicated by this section and whose work has resulted in construction with a record of successful in-service performance.

D. All paint/coating products must comply with V.O.C. requirements of New York City Building Code. Federal numbers, where specified or referred to, are for guidelines only.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.

C. Samples: Submit representative samples of for the Commissioner's review of color and texture only. Provide a listing of material and application for each coat of each finish sample.
   1. Submit on 12" x 12" substrate sample provide two samples of each color and material, with finish and texture to simulate actual conditions. Resubmit samples as requested by the Commissioner until acceptable sheen, color, and texture is achieved.

1.5 MOCK-UP

A. On actual wall surfaces and other building components, duplicate painted finishes of prepared samples. On at least 500 sq. ft. of surface, provide full-coat finish samples until required sheen, color and texture is obtained. Simulate finished lighting conditions for review of in-place work.

1.6 DELIVERY AND STORAGE

A. Deliver materials in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:
   1. Name or title of material.
   2. Fed. Spec. number, if applicable.
   3. Manufacturer's stock number and date of manufacture.
   4. Manufacturer's name.
   5. Contents by volume, for major pigment and vehicle.
   6. Thinning and application instructions.
   7. Color name and number.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
   1. Protect from freezing where necessary. Keep storage area neat and orderly. Remove oily rags and waste daily. Take all precautions to ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

1.7 JOB CONDITIONS

A. Apply water-base paints only when temperature of surfaces to be painted and surrounding air are between 50 deg F and 90 deg F, unless otherwise permitted by paint manufacturer.

B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air are between 45 deg F and 95 deg F, unless otherwise permitted by paint manufacturer.

C. Do not apply paint when relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by paint manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following.

1. Benjamin Moore and Co. (Moore).
2. PPG Industries, Pittsburgh Paints (P.P.).
3. Sherwin Williams (S-W).
4. Or approved equal.

2.2 MATERIALS

A. Material Quality: Provide best quality grade of coatings as regularly manufactured by acceptable paint manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

B. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

C. Primers: Provide prime paint as recommended by manufacturer to be compatible with substrate and finish coat.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSPECTION

A. Examine areas and conditions under which painting work is to be applied and notify the Commissioner of conditions detrimental to the work. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Starting of painting work will be construed as acceptance of surfaces and conditions within any particular area.

C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.3 SURFACE PREPARATION

A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as specified for each substrate.
   1. Provide barrier coats over incompatible primers or remove and reprime as required. Notify the Commissioner in writing of any anticipated problems in using the specified coating systems with substrates primed by others.
   2. Remove hardware, plates, lighting fixtures, and similar items not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Following completion of painting, reinstall removed items.
   3. Clean surfaces to be painted before applying paint. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.

B. Ferrous Metals: Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
   1. Touch-up shop-applied prime coats wherever damaged or bare, where required by other sections of these specifications. Clean and touch-up with same type shop primer.
   2. Remove loose paint from existing convector enclosure surfaces. Touch-up, fill, sand and prepare convector enclosures and windows to receive paint.

3.4 MATERIALS PREPARATION

A. Mix and prepare painting materials in accordance with manufacturer's directions.

B. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.

C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

3.5 APPLICATION

A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
   1. Paint colors, surface treatments, and finishes, are indicated in "schedules" of the contract documents.
   2. Provide finish coats which are compatible with prime paints used.
   3. Apply additional coats when undercoats or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equal to flat surfaces.
   4. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.
   5. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
   6. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.
   7. Sand lightly between each succeeding enamel or varnish coat.
   8. Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.

B. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, or otherwise prepared as soon as practicable after preparation and before subsequent surface deterioration.
   1. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as recommended by coating manufacturer.

D. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to those items exposed in occupied spaces.

E. Prime Coats: Apply prime coat on material which has not been prime coated by others.
   1. Recoat defects in primed and sealed surfaces, to assure a finish coat with no burn-through or other defects due to insufficient sealing.

F. Pigmented (Opaque) Finishes: Provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, fish eyes, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.

G. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

3.6 CLEAN-UP AND PROTECTION

A. Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch otherwise damage finished surfaces.

B. Protection: Protect work of other trades against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Commissioner.
   1. Provide "Wet Paint" signs to protect newly-painted finishes. Remove temporary protection after completion of painting.
   2. At completion of work of other trades, touch-up and restore all damaged or defaced surfaces.

3.7 INTERIOR PAINT SCHEDULE

A. General: Provide following interior paint systems, or approved equal, as selected by the Commissioner. Ceilings to be flat finish; walls (except at bathroom) to be eggshell finish; walls at bathroom to be semi-gloss finish; painted woodwork to be semi-gloss finish.

B. Drywall and Plaster:
   1. Acrylic Latex, Flat Finish: Factory-formulated flat acrylic-emulsion latex paint for interior application, applied at a dry film thickness of not less than 1.3 mils with a degree of gloss between 2-5. (Interior Drywall Ceiling – New Work and Painted)
      a. Primer Coat: Interior wall primer equal to Benjamin Moore’s Regal Premium Interior Latex Primer & Underbody #216, Akzo Glidden Professional Gripper GP 3210, Sherwin Williams Promar 200 Interior Latex Primer or approved equal.
      b. Two Coats: Acrylic latex paint equal Benjamin Moore Regal Flat Finish Wall Satin #215, Akzo Glidden Professional Diamond 350 Flat GP 1201, Sherwin Williams Promar 200 Zero VOC Interior Latex Flat B30-2600 or approved equal.
   2. Acrylic Latex, Eggshell (low-luster) Finish: Factory-formulated eggshell acrylic-latex interior enamel, applied at a dry film thickness of not less than 1.4 mil with a degree of gloss between 7-15. (Interior Plaster and Drywall – New Work or Painted)
      a. Primer Coat: Interior wall primer equal to Benjamin Moore’s Regal Premium Interior Latex Primer & Underbody #216 for New Work OR Spot Prime – Moorcraft Enamel Undercoater & Primer Sealer #253 for Previously Painted Surfaces, Akzo Glidden Professional Gripper GP3210, Sherwin Williams Promar 200 Interior Latex Primer or approved equal.

b. Two Coats: Acrylic latex paint equal to Benjamin Moore Eggshell Aquavelvet #319, Akzo Glidden Professional Diamond 350 Acrylic Eggshell GP1403, Sherwin Williams Promar 200 Zero VOC Interior Latex Eggshell or approved equal.

3. Acrylic Enamel, Satin (Pearl): Factory-formulated pearl acrylic-latex interior enamel for interior application, applied at a dry film thickness of not less than 1.3 mils with a degree of gloss between 15-20. (Interior Plaster and Drywall – New Work or Painted where indicated)
   a. Primer Coat: Interior wall primer equal to Benjamin Moore's Regal Premium Interior Latex Primer & Underbody #216 for New Work OR Spot Prime – Moorcraft Enamel Undercoater & Primer Sealer #253 for Previously Painted Surfaces, Akzo Glidden Professional Gripper GP3210, Sherwin Williams Promar 200 Interior Latex Primer or approved equal.
   b. Two Coats: Acrylic latex paint equal to Benjamin Moore Regal Pearl Finish AquaPearl #310, Akzo Glidden Diamond 450 No VOC 7300, Sherwin Williams All Surface Enamel Satin or approved equal.
4. Acrylic Enamel, Semi-Gloss Finish: Factory-formulated semigloss acrylic-latex interior enamel for interior application, applied at a dry film thickness of not less than 1.3 mils with a degree of gloss between 40-55. (Interior Plaster and Drywall – New Work or Painted where indicated)
   a. Primer Coat: Interior wall primer equal to Benjamin Moore's Regal Premium Interior Latex Primer & Underbody #216 for New Work OR Spot Prime – Moorcraft Enamel Undercoater & Primer Sealer #253 for Previously Painted Surfaces, Akzo Glidden Professional Gripper GP3210, Sherwin Williams Promar 200 Interior Latex Primer or approved equal.
   b. Two Coats: Acrylic latex paint equal to Benjamin Moore Regal Semi-Gloss Aquaglo #333, Akzo Glidden 450 No VOC 7400, Sherwin Williams ProClassic Semi Gloss or approved equal.

C. Previously Painted Concrete, Masonry, Stucco: Verify existing substrate condition and paint type.
1. Acrylic Enamel, Satin/Semi-Gloss Finish: Factory-formulated flat acrylic-emulsion latex paint for interior application, applied at a dry film thickness of not less than 1.3 mils with a degree of gloss between 40-55.
   a. Primer Coat: Interior wall primer equal to Benjamin Moore's Fresh Start All Purpose 100% Acrylic Primer #023, Akzo Glidden Block Filler 3010 Primer, Sherwin Williams Loxon Concrete and Masonry Primer or approved equal.
   b. Two Coats: Acrylic latex paint equal Benjamin Moore Regal Semi-Gloss AquaGlo #333, Akzo Glidden Diamond 450 No VOC 7400, Sherwin Williams Promar 200 HP Zero VOC Latex Semi-Gloss or approved equal.

D. Interior Wood Trim, Cabinets & Doors - New and Painted:
1. Acrylic Enamel, Semi-Gloss Finish: Factory-formulated semigloss acrylic-latex interior enamel for interior application, applied at a dry film thickness of not less than 1.3 mils with a degree of glass between 40-55.
   a. Primer Coat: Primer equal to Benjamin Moore's Fresh Start All Purpose 100% Acrylic Primer #023, Akzo Glidden Gripper 3210 Primer, Sherwin Williams Preimum Wall & Wood Latex Primer B28W8111 or approved equal.
   b. Two Coats: Acrylic latex paint equal Benjamin Moore Regal Semi-Gloss AquaGlo #333, Akzo Glidden Diamond 350 1407, Sherwin Williams Promar 200 HP Zero VOC Latex Semi-Gloss B31-1900 or approved equal.

E. Ferrous Metal – New and Painted: For painted surfaces, verify substrate paint type.
1. Alkyd Enamel, Satin Finish:

a. Primer Coat: Primer equal to Benjamin Moore's D.T.M. Semi-Gloss #M26, Akzo Glidden Devguard 4160 primer, Sherwin Williams Pro Industrial Pro-Cryl Universal Primer B66-1300 or approved equal.
b. Two Coats: Regal Aquaglo Semi-Gloss Enamel #333, Akzo Glidden Devoe Coatings Devguard 1516, Sherwin Williams B33-1851 or approved equal.

F. Galvanized Metal – New and painted:
1. Latex Enamel, Satin Finish:
a. Primer Coat: Primer equal to Benjamin Moore's D.T.M. Semi-Gloss #M29, Akzo Glidden Devoe Devflex DTM4020, Sherwin Williams Pro Industrial Pro-Cryl Universal Primer B66-1300 or approved equal.
b. Two Coats: Regal Aquaglo Semi-Gloss Enamel #333, Akzo Glidden Devflex WB Arylic 4212, Sherwin Williams Promar 200 HP Zero VOC Latex Eggshell B20-1900 or approved equal.

3.8 PAINT COLOR SCHEDULE

A. Colors and Locations: As indicated on Finish Schedule.

END OF SECTION 09 90 00

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SECTION 10 21 40 - STATIONARY METAL BLADE WALL LOUVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Work Included:
   1. Stationary metal wall louvers and vents as indicated on Drawings and as specified herein.

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards will be deemed mandatory and applicable to the Work.
   1. Air Movement and Control Association (AMCA)
   2. American Architectural Manufacturers Association (AAMA)
   3. Aluminum Association (AA)
   4. American Society for Testing and Materials (ASTM)
   5. American Society of Civil Engineers (ASCE)

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings
   1. Include plans, elevations, sections, details, and attachments to other Work. Show blade profiles, angles, spacing and mullions.

C. Product Data
   1. Catalog cuts, specifications, and installation instructions for louvers indicated, showing conformance with specified properties and performance criteria, and with appropriate AMCA Certified Rating Seals.

D. Samples
   1. Samples for Initial Selection: For units with factory-applied color finishes.
   2. Samples for Verification: For each type of metal finish required.

E. Warranties in accordance with Article 1.7.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Louvers must be rated by AMCA (Air Movement and Control Assoc.). Units must be marked with the required AMCA Certified Ratings Seal.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle products of this Section as recommended by manufacturer to protect from damage.

1.7 WARRANTY

A. Finish must be fully warranted against chipping, peeling, cracking, crazing, blistering, chalking and fading for a period of 10 years.

PART 2 - PRODUCTS

2.1 ALUMINUM LOUVERS

A. Type: Stationary extruded louvers, minimum 2" deep unless indicated otherwise. Ruskin Type ELF211, Reliable Louvers 445RGD5, Greenheck ESD 435 or approved equal.

B. Properties
1. Material: 6063T5 aluminum alloy
2. Frame extrusions: not less than 0.081” thick
3. Blades: not less than 0.061” thick
4. Blade profile: Drainable
5. Free area: not less than 40%.

C. Performance Criteria:
1. Wind loads: Louvers must be designed to withstand the effects of wind loads without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Determine wind loads based on a uniform pressure of 40 lbf/sq.ft. acting inward or outward.
2. Wind driven rain: Provide louvers complying with requirements specified, as demonstrated by testing according to AMCA 500-L.
    a. Point of beginning water penetration: Not less than 1050 fpm.
    b. Air performance: Not more than 0.20 inch w.g. static pressure drop at 1000 fpm free-area velocity.

D. Fabrication
1. Form frames with mitered or coped members, welded or riveted and soldered joints. Form ends of blades flat against frame jamb and weld, or rivet and solder blades to frame at each end to ensure

watertight joints. Reinforce units with concealed plates, angles, tees or other shapes to form rigid unit. Allow for expansion and contraction.
2. Assemble louvers in factory to minimize field splicing and assembly.
3. Maintain equal louver blade spacing to produce uniform appearance.
4. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

E. Finishes:
1. The finishes must be certified as complying fully with requirements of AAMA Specification 2605-11.
a. Finish as indicated on Drawings as follows:
1) Color as selected by the Commissioner from manufacturer's standard colors or to match windows where adjacent to windows – or to match adjacent brick from manufacturer's standard factory colors: Dark Bronze to match windows or Light Stone to match brick - Protect exposed factory finished surfaces prior to shipping.
2) 10-year warranty for finish

F. Sills: Same material and finish as louvers or cast stone – as indicated in Drawings.

2.2 LOUVER SCREENS

A. General: Fabricate removable screen frames of same metal and finish as louvers. Locate screens on inside face of louvers, unless otherwise indicated. Secure screens to louver frames with machine screws at each corner and spaced as required o.c along frame perimeter.

2.3 BLOCK AND BRICK VENTS

A. Block/Brick Vents: Extruded (6063T6 alloy) or cast aluminum (#319 alloy) masonry size units, minimum 0.125" thick aluminum with 1/4" structural ribs. Provide aluminum insect screening secured to interior face of vent. Provide aluminum duct extending through wall as required to suit condition.
1. Finish: Match finish of louvers – in Par. 2.1.E.

2.4 FASTENERS AND ANCHORS

A. Bolts, Nuts, Lags, Washers, Screws and Anchors: Same material as items being installed unless otherwise indicated. Types, gages and lengths to suit unit installation conditions. Aluminum or stainless steel for exterior locations or for items anchored to exterior walls.

2.5 MISCELLANEOUS

A. Provide protection for aluminum against galvanic action wherever dissimilar materials are in contact, by painting the complete contact surfaces of the dissimilar material with 7 to 9 mils of epoxy paint similar to Tnemec Chembuild Series 135 or Series 27 Typoxy, Benjamin Moore Corotech Primer V110 & V450 finish, Sherwin Williams Macropoxy 646 B58 Series and B65 Series or approved equal. Do not coat paint beyond surface in contact.

B. Isolate the aluminum from concrete and masonry by coating aluminum with 7 to 9 mils of epoxy paint similar to Tnemec Chembuild Series 135 or Series 27 Typoxy, Benjamin Moore Corotech Primer V110 & V450

finish, Sherwin Williams Macropoxy 646 B58 Series and B65 Series or approved equal. Do not coat paint beyond surface in contact.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates and openings, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
   1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.4 INSTALLATION

A. Install Work of this Section in accordance with manufacturer's printed instructions, except as shown otherwise on Drawings.

B. Install units plumb, level and in proper alignment with adjacent construction.

C. Form tight joints with exposed connections accurately fit together.

D. Provide concealed anchorages wherever possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to form weathertight connection.

E. Where louvers are in contact with concrete, masonry or dissimilar metal, coat contacting surface with heavy coat of bituminous paint.

3.5 ADJUSTING AND CLEANING

A. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.

B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

C. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by the Commissioner, remove damaged units and replace with new units.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 10 21 40

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SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Pipe and valve markers for plumbing systems.
   2. Nameplates for plumbing equipment.
   3. Sleeves for interior floor and wall pipe penetrations.
   4. Steel channel.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Required.

C. Project Record Documents: Required.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

PART 2 - PRODUCTS

2.1 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

A. Plastic Nameplates: Laminated plastic with engraved letters.

B. Plastic Tags: Laminated plastic with engraved letters, minimum 1-1/2 inches diameter.

C. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering.

2.2 SLEEVES

A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage thick galvanized steel.

B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18-gage thick galvanized steel.

2.3 MECHANICAL SLEEVE SEALS

A. Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.4 FORMED STEEL CHANNEL

A. Galvanized 12-gage thick steel. With holes 1-1/2 inches on center.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION - PIPING AND EQUIPMENT IDENTIFICATION

A. Install plastic nameplates with adhesive.

B. Install plastic tags with corrosion resistant metal chain.

3.3 INSTALLATION - SLEEVES

A. Exterior watertight entries: Seal with mechanical sleeve seals.

B. Set sleeves in position in forms. Provide reinforcing around sleeves.

C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

D. Extend sleeves through floors at finished floor level. Caulk sleeves.

E. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with firestopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

F. Install stainless steel escutcheons at finished surfaces.

END OF SECTION 22 05 00

SECTION 22 05 03 - PIPES AND TUBES FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes: Pipe and pipe fittings for the following systems:
   1. Natural gas piping.

B. Related Sections:
   1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
   2. Section 08 31 00 - Access Doors and Frames: Product requirements for access doors for placement by this section.
   3. Section 09 90 00 - Painting and Coating: Product and execution requirements for painting specified by this section.
   4. Section 22 05 23 - General-Duty Valves for Plumbing Piping: Product requirements for valves for placement by this section.
   5. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment: Product requirements for pipe hangers and supports and firestopping for placement by this section.

1.3 REFERENCES

A. ASTM International:
   1. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings.
   2. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
   3. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings.

B. Cast Iron Soil Pipe Institute:
   1. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.
   2. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.

C. National Fire Protection Association:
   1. NFPA 54 - National Fuel Gas Code.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate layout of piping systems, including equipment, critical dimensions, and sizes. Product Data: Submit data on pipe materials and fittings. Submit manufacturers catalog information.

C. Welders' Certificate: Include welders' certification of compliance with ASME Section IX.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.

C. Perform Work in accordance with NYCBC standard.

D. Maintain one (1) copy of each document on site.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing work of this section with minimum three (3) years documented experience properly trained by manufacturer.

C. Design piping systems under direct supervision of a Professional Engineer licensed in the State of New York and experienced in design of this Work.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.8 DELIVERY, STORAGE AND HANDLING

A. Furnish temporary end caps and closures on piping and fittings. Maintain in place until installation.

B. Protect piping from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 COORDINATION

A. Coordinate installation of buried piping with trenching.

PART 2 - PRODUCTS

2.1 NATURAL GAS PIPING, ABOVE GRADE

A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
   1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M forged steel welding type.
   2. Joints: Threaded for pipe 2 inches and smaller; welded for pipe 2-1/2 inches and larger.

2.2 UNIONS AND FLANGES

A. Unions for Pipe 2 inches and Smaller:
   1. Ferrous Piping: Class 250, malleable iron, threaded.
   2. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

B. Flanges for Pipe 2-1/2 inches and Larger:
   1. Ferrous Piping: Class 150, forged steel, slip-on flanges.
   2. Gaskets: 1/16 inch thick preformed neoprene gaskets.
   3. Flanges must be of same weight as the fittings and valves in each service category. Welding neck flanges must be used with flanged valves and equipment on welded lines. Galvanized screwed flanges must be used on galvanized screwed lines. Flanges must be drilled in conformance with 150 lbs. or 300 lbs. standard and must be faced and spot-faced. Threaded and loose flanges on brass piping must be brass. Laps must be machined on front, back and edge. Threaded flanges must have faces perpendicular to adjoining pipe.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment with flanges or unions.

D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.3 INSTALLATION - ABOVE GROUND PIPING

A. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.

B. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.

C. Group piping whenever practical at common elevations.

D. Sleeve pipe passing through partitions, walls and floors. Refer to Section 22 05 29.

E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 22 05 29.

G. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

H. Install valves in accordance with Section 22 05 23.

I. Install pipe identification in accordance with Section 22 05 53.

J. All piping must be prepped, cleaned and painted in accordance with Section 09 90 00.

3.4 INSTALLATION - GAS PIPING SYSTEMS

A. Install natural gas piping in accordance with NFPA 54.

B. Install Work in accordance with NYCBC.

3.5 FIELD QUALITY CONTROL

A. Pressure test natural gas piping in accordance with NFPA 54 and New York Fire Code Section 406.4.

END OF SECTION 22 05 03

SECTION 22 05 23 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Plug valves.

B. Related Sections:
   1. Section 22 05 03 - Pipes and Tubes for Plumbing Piping and Equipment: Product and installation requirements for piping materials applying to various system types.
   2. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment: Product and installation requirements for pipe hangers and supports.

1.3 REFERENCES

A. Manufacturers Standardization Society of the Valve and Fittings Industry:
   1. MSS SP 78 - Cast Iron Plug Valves, Flanged and Threaded Ends.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit manufacturers catalog information with valve data and ratings for each service.

C. Manufacturer's Installation Instructions: Submit hanging and support methods, joining procedures.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of valves.

B. Operation and Maintenance Data: Submit installation instructions and exploded assembly views.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Perform Work in accordance with New York City Plumbing Code and New York City Fire Code standards.

C. Maintain one (1) copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing work of this section with minimum three (3) years documented experience.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

1.10 WARRANTY

A. Furnish five-year manufacturer warranty for valves excluding packing.

PART 2 - PRODUCTS

2.1 PLUG VALVES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Norstrom Valves, Inc.
2. Homestead Valve Industrial Products
3. Maverick Valves B.V.
4. Or approved equal

B. 2 inches and Smaller: MSS SP 78, Class 150, semi-steel construction, round port, full pipe area, pressure lubricated, teflon packing, threaded ends. Furnish one plug valve wrench for every ten plug-valves with minimum of one wrench.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify piping system is ready for valve installation.

3.3 INSTALLATION

A. Install valves with stems upright or horizontal, not inverted.

B. Refer to Section 22 05 29 for pipe hangers.

C. Refer to Section 22 05 03 for piping materials applying to various system types.

D. Install Work in accordance with New York City Plumbing Code and New York City Fire Code standards.

3.4 VALVE APPLICATIONS

A. Install shutoff valves at locations indicated on Drawings in accordance with this Section.

END OF SECTION 22 05 23

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SECTION 22 05 29 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
1. Pipe hangers and supports.
2. Hanger rods.
3. Inserts.
4. Sleeves.
5. Formed steel channel.
6. Firestopping relating to plumbing work.
7. Firestopping accessories.

B. Related Sections:
1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
2. Section 09 90 00 - Painting and Coating: Product and execution requirements for painting specified by this section.
3. Section 22 05 03 - Pipes and Tubes for Plumbing Piping and Equipment: Execution requirements for placement of hangers and supports specified by this section.

1.3 REFERENCES

A. American Welding Society:
1. AWS D1.1 - Structural Welding Code - Steel.

B. FM Global:
1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.

C. Manufacturers Standardization Society of the Valve and Fittings Industry:
1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

D. Underwriters Laboratories Inc.:
1. UL 1479 - Fire Tests of Through-Penetration Firestops.

1.4 SYSTEM DESCRIPTION

A. Firestopping Materials: Comply with requirements of Section 07 84 00.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate system layout with location including critical dimensions, sizes, and pipe hanger and support locations and detail of trapeze hangers.

C. Product Data:
1. Hangers and Supports: Submit manufacturers catalog data including load capacity.

D. Engineering Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers. Indicate calculations used to determine load carrying capacity of trapeze, multiple pipe, and riser support hangers. Sizing methods and calculations sealed by a Professional Engineer registered in the State of New York.

E. Manufacturer's Installation Instructions:
1. Hangers and Supports: Submit special procedures and assembly of components.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

G. Engineering Judgments: For conditions not covered by UL or WH listed designs, submit judgments by a Professional Engineer licensed in the State of New York.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

B. Protect from weather and construction traffic, dirt, water, chemical, and damage, by storing in original packaging.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.11 WARRANTY

A. Furnish five-year manufacturer warranty for pipe hangers and supports.

PART 2 - PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Carpenter & Paterson Inc.
   2. Creative Systems Inc.
   3. Flex-Weld, Inc.
   4. Glope Pipe Hanger Products Inc.
   5. Michigan Hanger Co.
   6. Superior Valve Co.
   7. Or approved equal

B. Furnish materials in accordance with the New York City Building Code standards.

C. Plumbing Piping - DWV:
   1. Conform to MSS SP58 and MSS SP69.
   2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Carbon steel, adjustable swivel, split ring.
   3. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
   4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
   5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
   6. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
   7. Vertical Support: Steel riser clamp.
   8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

2.2 ACCESSORIES

A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

2.3 INSERTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Hilti
   2. Powers
   3. Simpson Strong-Tie
   4. Or approved equal

B. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.4 SLEEVES

A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage thick galvanized steel.

B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18-gage thick galvanized steel.

C. Sealant: Refer to Section 07 92 00.

2.5 MECHANICAL SLEEVE SEALS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Thunderline Link-Seal, Inc.
2. NMP Corporation.
3. Hancor
4. Or approved equal

B. Furnish materials in accordance with the State of New York standards.

C. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.6 FORMED STEEL CHANNEL

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Allied Tube & Conduit Corp.
2. B-Line Systems
3. Midland Ross Corporation, Electrical Products Division.
4. Unistrut Corp.
5. Or approved equal

B. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify openings are ready to receive sleeves.

B. Verify openings are ready to receive firestopping.

3.3 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.

B. Remove incompatible materials affecting bond.

C. Obtain permission from the Commissioner before using powder-actuated anchors.

D. Do not drill or cut structural members.

3.4 INSTALLATION - INSERTS

A. Install inserts for placement in concrete forms.

B. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches and larger.

D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

3.5 INSTALLATION - PIPE HANGERS AND SUPPORTS

A. Install in accordance with MSS SP 58 and MSS SP 69.

B. Support horizontal piping as scheduled.

C. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.

D. Place hangers within 12 inches of each horizontal elbow.

E. Use hangers with 1-1/2 inch minimum vertical adjustment.

F. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

G. Support vertical piping at every other floor. Support vertical cast iron pipe at each floor at hub.

H. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.

I. Support riser piping independently of connected horizontal piping.

J. Design hangers for pipe movement without disengagement of supported pipe.

K. Prime coat exposed steel hangers and supports. Refer to Section 09 90 00. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

3.6 INSTALLATION - SLEEVES

A. Exterior watertight entries: Seal with mechanical sleeve seals.

B. Set sleeves in position in forms. Provide reinforcing around sleeves.

C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

D. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.

E. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with firestopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

F. Install stainless steel escutcheons at finished surfaces.

3.7 INSTALLATION – FIRESTOPPING

A. Firestopping Materials: Comply with requirements of Section 07 84 00.

3.8 FIELD QUALITY CONTROL

A. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.9 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.10 PROTECTION OF FINISHED WORK

A. Protect adjacent surfaces from damage by material installation.

3.11 SCHEDULES

A. Pipe Hanger Spacing:

PIPE HANGER SPACING		
PIPE MATERIAL	MAXIMUM HANGER SPACING Feet	HANGER ROD DIAMETER Inches
Steel, 3 inches and smaller	12	1/2
Steel, 4 inches and larger	12	5/8

END OF SECTION 22 05 29

SECTION 22 05 53 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Tags.
   2. Pipe markers.

B. Related Sections:
   1. Section 09 90 00 - Painting and Coating: Execution requirements for painting specified by this section.

1.3 REFERENCES

A. American Society of Mechanical Engineers:
   1. ASME A13.1 - Scheme for the Identification of Piping Systems.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit manufacturers catalog literature for each product required.

C. Shop Drawings: Submit list of wording, symbols, letter size, and color coding for mechanical identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

D. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures and installation.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.

C. Maintain one (1) copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 TAGS

A. Metal Tags:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Seton
      b. Pipe Marker
      c. Brimar Inc.
      d. Or approved equal
   2. Brass with stamped letters; tag size minimum 1-1/2 inches diameter with finished edges.

B. Tag Chart: Typewritten letter size list of applied tags and location within plastic laminated cover.

2.2 PIPE MARKERS

A. Color and Lettering: Conform to ASME A13.1.

B. Plastic Pipe Markers:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Seton
      b. Pipe Marker
      c. Brimar Inc.
      d. Or approved equal
   2. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

3.3 INSTALLATION

A. Install tags using corrosion resistant chain. Number tags consecutively by location.

B. Identify valves in main and branch piping with tags.

C. Identify piping, concealed or exposed, with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.

3.4 SCHEDULES

A. Identification:
   1. Gas:
      a. Identification Type: Pipe Maker
      b. Background Color: Yellow
      c. Lettering Size: 1-1/2”
      d. Lettering Color: Black

B. Valve Tags:
   1. Tag Material: Brass
   2. Tag Size: 1-1/2” Diameter
   3. Tag Shape: Circle
   4. Tag Color: Yellow

END OF SECTION 22 05 53

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SECTION 22 08 00 - COMMISSIONING OF PLUMBING 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. Commissioning process requirements for Plumbing systems, assemblies and equipment.

B. Related Sections:
   1. DDC General Conditions Section 01 91 13 “General Commissioning Requirements for MEP Systems” for general commissioning process requirements.

1.3 DESCRIPTION

A. Commissioning is a systematic process of confirming that all building systems perform interactively according to the Owner’s Project Requirements and the Basis of Design and continuing through construction, acceptance and the warranty period with actual verification of performance.

B. The Commissioning process does not take away from or reduce the responsibility of the Contractor to provide a finished and fully functioning product.

C. The CxA directs and coordinates the commissioning activities and reports to the Commissioner. All members in the construction process work together to fulfill their contracted responsibilities and meet the objectives of the Owner’s Project Requirement’s as detailed in the Contract Documents.

1.4 DEFINITIONS

A. Refer to the DDC General Conditions Section for definitions.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. CxA will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The CxA will notify the Contractor, or Commissioner as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission.

C. The CxA will receive a copy of the final approved submittals.

D. In addition, the Contractor is to provide the following:
   1. Certificate of readiness
   2. Certificates of completion of installation, prestart, and startup activities.
   3. O&M manuals
   4. Test reports

E. Refer to the DDC General Conditions Section 01 33 00 "Submittal Procedures" and Section 01 91 13 "General Commissioning Requirements for MEP Systems" for general commissioning submittal requirements.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Equipment Calibration Requirements: The Contractor will comply with test manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately after instruments have been repaired resulting from being dropped or damaged. Affix calibration tags to test instruments. Furnish calibration records to CxA upon request.

1.7 COORDINATION

A. Commissioning Kick-Off Meeting – Construction Team: The Contractor will attend a meeting of the Commissioning Team, chaired by the CxA, to review the scope of commissioning process activities and the Commissioning Plan with discussions on milestones, activities, and assignments of responsibilities. The flow and type of documents and the amount of submittal data given to the CxA will be determined. Meeting minutes will then be distributed to all parties by the CxA.

B. Commissioning Meetings: The Contractor will attend coordination meetings with the Commissioning Team, chaired by the CxA, to review progress on the Commissioning Plan, construction deficiencies, scheduling conflicts, and to discuss strategies and processes for upcoming commissioning process activities.

C. Miscellaneous Construction Meetings: The CxA attends selected planning and job-site meetings in order to remain informed on construction progress and to update parties involved in the commissioning process. This will not include 100% meeting attendance, but the CxA shall be provided with the subsequent meeting minutes for review.

D. Pre-testing Meetings: The Contractor will attend pretest meetings with the Commissioning Team, chaired by the CxA, to review startup reports, pre-test inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested.

E. Testing: Contractor will coordinate with testing personnel and agencies for timing and access for CxA to witness test.

F. Manufacturers' Inspection and Startup Services: Contractor will coordinate services of manufacturers' inspection and startup services.

G. Testing, Adjusting and Balancing: Contractor will coordinate with plan and schedule for testing, adjusting and balancing for timing and access for CxA to witness process.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

A. All standard testing equipment required to perform startup, initial checkout and functional performance testing shall be provided by the Contractor for the equipment being tested. The Contractor is required to complete testing. For example, the Contractor shall ultimately be responsible for all standard testing equipment for the plumbing system in Division 22. A sufficient quantity of two-way radios shall be provided by the Contractor.

B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed. Proprietary test equipment (and software) shall become the property of the City of New York's personnel upon completion of the commissioning process.

C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. Unless otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to accuracy of 0.5°F and a resolution of ±0.1°F. Pressure sensors shall have an accuracy of ±2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL DOCUMENTATION REQUIREMENTS

A. With assistance from the Contractor, the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems. These checklists shall be provided to the Contractor for completion. The CxA shall gather and review the completeness and accuracy of these checklists via site visits.

B. Red-lined Drawings (As-Builts): The Contractor will verify all equipment, systems, instrumentation, wiring and components are shown correctly on red-lined drawings. Preliminary, red-lined drawings must be made available to the Commissioning Team for use prior to the start of Functional Performance Testing. Changes, as a result of Functional Testing, must be incorporated into the final as-built drawings, which will be created from the red-lined drawings. The contracted party, as defined in the Contract Documents will create the as-built drawings.

C. Operation and Maintenance Data: The Contractor will provide a copy of O&M literature within 45 days of each submittal acceptance for use during the commissioning process for all commissioned equipment and systems. The CxA will review the O&M literature once for conformance to project requirements. The CxA will receive a copy of the final approved O&M literature once corrections have been made by the Contractor.

D. Demonstration and Orientation: The Contractor will provide demonstration and orientation as required by the specifications. A complete orientation plan and schedule must be submitted by the Contractor to the CxA four weeks (4) prior to any orientation. An orientation agenda for each orientation session must be submitted to the CxA one (1) week prior the orientation session.

3.3 CONTRACTOR'S RESPONSIBILITIES

A. Refer to the DDC General Conditions Section 01 91 13 “General Commissioning Requirements for MEP Systems” for Contractor’s responsibilities.

B. The Contractor shall ensure that the plumbing subcontractor attends construction phase controls coordination meetings.

C. The Contractor shall ensure that the plumbing subcontractor attends domestic water balancing review and coordination meetings.

D. The Contractor shall ensure that the plumbing subcontractor participates in plumbing systems, assemblies, equipment, and component maintenance orientation and inspection as directed by the CxA.

E. Provide information requested by the CxA for final commissioning documentation.

F. Prepare preliminary schedule for Plumbing system orientations and inspections, operation and maintenance manual submissions, orientation sessions, pipe and duct system testing, flushing and cleaning, equipment start-up, testing and balancing and task completion for the Commissioner. Distribute preliminary schedule to commissioning team members. Provide measuring instruments and logging devices to record test data, and provide data acquisition equipment to record data for the complete range of testing for the required test period.

G. Provide detailed startup procedures.

H. Provide a written list of all user adjustable set-points and reset schedules with a brief discussion of the purpose of each and the range of reasonable adjustments with energy implications.

I. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.

J. Respond to provided new deficiencies and/or responses within five (5) business days.

K. Gather operation and maintenance literature on all equipment, and assemble in binders as required by the Contract Documents. Submit to CxA 45 days after submittal acceptance.

L. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.

M. Notify the CxA a minimum of two weeks in advance of the time for start of the testing and balancing work. Attend the initial testing and balancing meeting for review of the official testing and balancing procedures.

N. Provide written notification to the Commissioner and CxA that the following work has been completed in accordance with the Contract Documents, and that the equipment, systems, and sub-system are operating as required.
   1. Domestic Water system.
   2. Condensate Pump system.

O. The equipment supplier shall document the performance of their equipment.

P. Provide a complete set of red-lined drawings to the CxA prior to the start of Functional Performance Testing.

Q. Test, Adjust and Balance subcontractor, under the direction of the Contractor:
   1. Attend initial commissioning coordination meeting scheduled by the CxA.
   2. Submit the site-specific testing and balancing plan to the CxA and Commissioner for review and acceptance.
   3. Attend the testing and balancing review meeting scheduled by the CxA. Be prepared to discuss the procedures that shall be followed in testing, adjusting, and balancing the HVAC&R system.
   4. At the completion of the testing and balancing work, and the submittal of the final testing and balancing report, notify the HVAC&R subcontractor and the Contractor.
   5. Participate in verification of the testing and balancing report, which will consist of repeating measurements contained in the testing and balancing reports. Assist in diagnostic purposes when directed.
   6. Provided recommended setpoints as determined by testing, adjusting, and balancing such as static pressure and differential pressure setpoints.

R. Contractor responsibilities to be completed by Equipment Suppliers:
   1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the City of New York's personnel, to keep warranties in force.
   2. Assist in equipment testing.
   3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

3.4 CxA'S RESPONSIBILITIES

A. Roles and Responsibilities:
   1. Refer to the DDC General Conditions Section 01 91 13 "General Commissioning Requirements for MEP Systems" for general CxA responsibilities.

3.5 TESTING PREPARATION

A. Certify in writing to the CxA that Plumbing systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.

B. Certify in writing to the CxA that Plumbing instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.

C. Certify in writing that testing, adjusting, and balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.

D. Place systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).

E. Inspect and verify the position of each device and interlock identified on checklists.

F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.

G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

3.6 TESTING, ADJUSTING AND BALANCING VERIFICATION

A. Prior to performance of Testing, Adjusting, and Balancing work, provide copies of reports, sample forms, checklists, and certificates to the CxA.

B. Notify the CxA at least ten (10) days in advance of testing and balancing Work, and provide access for the CxA to witness testing and balancing Work.

C. Provide technicians, instrumentation, and tools to verify testing and balancing of HVAC&R systems at the direction of the CxA.
   1. The CxA will notify the Contractor ten (10) days in advance of the date of field verification. Notice will not include data points to be verified.
   2. The Contractor will ensure that the testing and balancing subcontractor shall use the same instruments (by model and serial number) that were used when original data were collected.
   3. Failure of an item includes, other than sound, a deviation of more than 10 percent. Failure of more than 10 percent of selected items shall result in rejection of final testing, adjusting, and balancing report. For sound pressure readings, a deviation of 3 dB shall result in rejection of final testing. Variations in background noise must be considered.
   4. Remedy the deficiency and notify the CxA so verification of failed portions can be performed.

3.7 GENERAL TESTING REQUIREMENTS

A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.

B. Scope of Plumbing testing shall include entire Plumbing installation, from central equipment for heat generation and refrigeration through distribution systems to each conditioned space. Testing shall include measuring capacities and effectiveness of operational and control functions.

C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.

D. The CxA along with the Contractor will ensure that the plumbing subcontractor, testing and balancing subcontractor, and plumbing Instrumentation and Control subcontractor shall prepare detailed testing plans, procedures, and checklists for plumbing systems, subsystems, and equipment.

E. Tests will be performed using design conditions whenever possible.

F. Simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by the CxA and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.

G. The CxA may direct that set points be altered when simulating conditions is not practical.

H. The CxA may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are not practical.

I. If tests cannot be completed because of a deficiency outside the scope of the Plumbing system, document the deficiency and report it to the Commissioner. After deficiencies are resolved, reschedule tests.

J. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

3.8 PLUMBING SYSTEMS, SUBSYSTEMS AND EQUIPMENT TESTING PROCEDURES

A. Equipment Testing and Acceptance Procedures: Testing requirements are specified in individual Division 22 sections. Provide submittals, test data, inspector record, and certifications to the CxA.

B. Plumbing Instrumentation and Control System Testing: Field testing plans and testing requirements are specified in Division 23 Sections "Direct-Digital Control System for HVAC" and "Sequence of Operations for HVAC Controls." Assist the CxA with preparation of testing plans.

C. Plumbing Distribution System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of air, fuel gas, sanitary waste and vent piping, storm drainage piping, sprinkler and domestic water distribution systems. The CxA shall determine the sequence of testing and testing procedures for each equipment item and pipe section to be tested.

D. Vibration and Sound Tests: Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.

E. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. Commissioning shall be performed on equipment and systems including but not limited to the following:
   1. Domestic Water System
   2. Domestic Water Heater
   3. Condensate Pump

3.9 DEFICIENCIES/NON-CONFORMANCE, FAILURE DUE TO MANUFACTURER DEFECT

A. Deficiencies/Non-Conformance:
   1. The CxA will record the results of the functional test on the test form. All deficiencies or non-conformance items shall be noted and reported to the Commissioner and Contractor on a standardized form.
   2. The Contractor shall respond to new deficiencies within five (5) business days. The response shall indicate the proposed means of correcting the issue and the anticipated date of correction. If further information is required to clarify the issue, the Contractor's response shall include a request such clarification. If the Contractor understands that the issue has been resolved or was noted in error, the Contractor's response shall provide an explanation of their reasoning, including reference to Contract Documents as necessary.
   3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA.
   4. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.
   5. As tests progress and a deficiency is identified, the CxA discusses the issue with the Contractor.
   6. When the issue does not require further clarification for the Contractor to resolve, the CxA documents the deficiency and the Contractor's response and corrections or plans for correction. The CxA and the Contractor then proceed to another test or sequence. Once the Contractor corrects the deficiency, the test is rescheduled and repeated to demonstrate correct operation or function.
   7. When additional information is required about any deficiency, whether to clarify the issue or to clarify the means of resolution or acceptance, the CxA documents the deficiency and the Contractor's response. The CxA will send the deficiency to the Commissioner and the Contractor, who shall forward to any subcontractors required for the correction. Once all parties are in agreement as to the means of resolving the issue, the CxA will document the agreed-upon resolution process. The CxA will document the correction or resolution. If the correction requires work by the Contractor, the Contractor and CxA will reschedule the test to demonstrate correct operation and function.
   8. Deficiencies that are not corrected at the time of documentation, shall be completed by the affected Contractor and photo evidence of the deficiency resolution shall be sent to both the Commissioner and the CxA.

B. Failure due to Manufacturer Defect:
   1. If 10% or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the CxA and the Commissioner. In such case, the Contractor shall provide the Commissioner with the following:
      a. Within one week of notification from the Contractor the manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the Commissioner within two weeks of the original notice.
      b. Within two weeks of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
      c. The Commissioner will determine whether a replacement of all identical units or a repair is acceptable.

d. Two examples of the proposed solution will be installed by the Contractor and the Contractor will be allowed to test the installations for up to one week, upon which the Commissioner will decide whether to accept the solution.
e. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

3.10 APPROVAL

A. The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA. The CxA recommends acceptance of each test to the Commissioner using a standard form.

3.11 SEASONAL TESTING

A. Seasonal Testing – During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the Contractor, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and record documents due to seasonal testing will be made by the Contractor.

3.12 OPERATION AND MAINTENANCE MANUALS

A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in the DDC General Conditions Section 01 78 39 "Contract Record Documents" and Section 01 91 13 "General Commissioning Requirements for MEP Systems."

B. The specific content and format requirements for the standard O&M manuals are detailed in the DDC General Conditions Section 01 78 39 "Contract Record Documents" and Section 01 91 13 "General Commissioning Requirements for MEP Systems." Special requirements for the controls subcontractor and TAB subcontractor are found in Division 23.

C. CxA Review and Approval – Prior to substantial completion, the CxA shall review the O&M manuals, documentation and record documents for systems that were commissioned to verify compliance with the Specifications. The CxA will communicate deficiencies in the manuals to the Contractor, or Commissioner, as requested. Upon a successful review of the corrections, the CxA recommends approval and acceptance of these sections of the O&M manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

3.13 INSTRUCTION OF CITY OF NEW YORK PERSONNEL

A. The Contractor shall be responsible for instruction coordination, scheduling, and ultimately for ensuring that instruction is completed.

B. The CxA shall oversee the instruction of the City of New York's personnel for commissioned equipment and systems.

1. The CxA shall interview the City of New York's personnel to determine the special needs and areas where instruction will be most valuable. The Commissioner and CxA shall decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA shall communicate the results to the Contractor who will ensure that the subcontractors and vendors are also notified about the results.
2. In addition to these general requirements, the specific instruction requirements of the City of New York's personnel by the Contractor are specified in the individual sections listed in DDC's General Conditions Section 01 79 00 "Demonstration and Owners' Pre-Acceptance Orientation."
3. The Contractor shall ensure that each subcontractor and vendor responsible for instruction will submit a written instruction plan to the Contractor for review and approval prior to instruction. The Contractor will submit one comprehensive instruction plan to the CxA and the Commissioner.
4. The plan will be reviewed by the CxA and the Commissioner. Comments pertaining to its deficiencies will be forwarded to the Contractor. The instruction plan will be rewritten until approved by the CxA and the Commissioner. The final approved instruction plan will cover the following elements:
    a. Equipment (included in instruction)
    b. Intended audience
    c. Location of instruction
    d. Objectives
    e. Subjects covered (description, duration of discussion, special methods, etc.)
    f. Duration of instruction on each subject
    g. Qualified instructor for each subject
    h. Instructor qualifications
    i. Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)
5. For the primary equipment, the Contractor shall ensure that the controls subcontractor provide a discussion of the control of the equipment during the mechanical or electrical instruction conducted by each subcontractor or vendor.
6. Instruction documentation shall include the following items:
    a. Copy of the instruction plan, including schedule, syllabus, and agenda.
    b. Copy of the Owner's Project Requirements.
    c. Copy of the Basis of Design.
    d. Compiled operations manuals.
    e. Compiled maintenance manuals.
    f. Completed manufacturer instruction manuals.
    g. Red-lined drawings.
7. The CxA develops criteria for determining that the instruction was satisfactorily completed, including attending the instruction, etc. The CxA recommends approval of the instruction to the Commissioner using a standard form. The Commissioner signs the approval form/letter template.
8. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment.
9. Video recording of the instruction sessions may be provided by the CxA in electronic format, at the discretion of the Commissioner.

END OF SECTION 22 08 00

SECTION 23 05 00 - GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) 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. This Section, 23 05 00, governs all requirements as applicable to the mechanical work specified in other Sections of Division 23.

1.2 MEASUREMENTS

A. Contractor must base all measurements, both horizontal and vertical from established benchmarks. All work must agree with these established lines and levels. Contractor must verify all measurements at site; and check the correctness of same as related to the work.

1.3 SPACE LIMITATIONS

A. The equipment selections used in the preparation of the Construction Documents must fit into the physical spaces provided and indicated, allowing ample room for access, servicing, removal and replacement of parts, etc. Adequate space must be allowed for clearance in accordance with Code requirements, the requirements of the City of New York and the equipment manufacturer's recommendations.

B. In the preparation of drawings, a reasonable effort to accommodate acceptable equipment manufacturer's space requirements has been made; however, since space requirements and equipment arrangement vary according to each manufacturer, the responsibility for initial access, maintenance access, Code-required access and proper fit rests with the Contractor.

C. Physical dimensions and arrangements of equipment to be installed will be subject to the Commissioner's review.

D. Coordinate the installation of equipment, ductwork, conduit, bus duct, piping, cable, cable trays, etc., installation with lighting fixtures, special ceiling construction, air distribution equipment and the structure. Provide additional rises, drops and offsets as required. If, after installed, new ductwork, conduit, bus duct, piping or cable is found to be in conflict with the architecture, structure or other trade work which is either existing or shown on the Construction Documents, the ductwork, conduit, bus duct, piping or cable must be relocated without additional cost to the City of New York.

E. The Contractor must follow the drawings in laying out the work and check drawings of all trades to verify spaces in which work will be installed. Maintain maximum headroom and, where space conditions appear inadequate, the Commissioner must be notified before proceeding with the installation.

1.4 LABOR AND MATERIALS

A. All materials and apparatus required for the work will be new, of first-class quality, and must be furnished, delivered, erected, connected and finished in every detail, and must be so selected and arranged as to fit properly into the building spaces.

B. Contractor must remove all materials delivered, or work erected, which does not comply with Contract Drawings and Specifications, and replace with proper materials, or correct such work as directed, at no additional cost to the City of New York.

1.5 COVERING OF WORK

A. No pipe, fitting, or other work of any kind will be covered up or hidden from view before it has been examined or approved by the Commissioner. Any unacceptable work, or unauthorized or disapproved materials discovered must be removed and corrected immediately.

B. Any type of equipment shown or specified to be installed outdoors, on grade, on roof or similar areas must have appropriate protection against outdoor weather. Equipment such as motors, panels, etc. must have rain hood or appropriate protection as provided under Division 23. Insulated pipes must have aluminum covers or as specified. Insulated ducts must be provided with aluminum jacket with overlapping, sealed joints. Uninsulated ducts must be soldered joints and seams or as specified. Where no protection is feasible, such as in exposed vibration springs, hangers, pipe or steel members, such items must be rated by the manufacturer for outdoor use or as approved by the Commissioner.

1.6 PROTECTION

A. Contractor must protect the work and material of all trades from damage by the work or workmen and replace all damaged material with new.

B. Contractor will be responsible for work and equipment until the work is finally inspected, tested and accepted; Contractor must protect the work against theft, injury or damage; and carefully store material and equipment received on site which is not immediately installed; close open ends of work with temporary covers or plugs during construction to prevent entry of obstructing material.

C. Contractor must be responsible for the preservation of all public and private property, along and adjacent to the work, and must use every precaution necessary to prevent damage or injury thereto. The Contractor must use suitable precautions to prevent damage to pipes, conduits and other underground structures or utilities, and must carefully protect from disturbance or damage all property marks until the Commissioner has witnessed or otherwise referenced their location and must not remove them until directed.

D. All mechanical and electrical equipment delivered to the site must have appropriate wrapping to protect them from rain, flood, wind, construction debris and all types of water damage normally encountered at the construction sites. Protection of equipment such as fans, coils, valves and similar equipment must be the responsibility of the Contractor receiving such equipment at the jobsite for installation under Division 23.

1.7 COMPLETE PERFORMANCE OF WORK

A. Contractor must provide all labor, materials, supervision, supplies, tools, scaffolding, machinery, equipment, appliances and services (including transportation, rigging, storage utilities, etc.) and all required permits and licenses necessary to complete the work under the Contract. All systems and equipment must be complete in every respect and all items of material, equipment and labor must be furnished, installed, tested and commissioned for a fully operational system.

B. Contractor must coordinate the work with the work of the other trades so as to resolve conflicts without impeding job progress or the project construction schedule.

C. Contractor must examine all Contract Documents for all sections of the specifications in order to determine the extent of work required to be completed under this section. Failure to examine all the Construction Documents for this project will not relieve the Contractor of the responsibility to perform all the work required for a complete, fully operational and satisfactory installation.

D. Work must be executed in strict accordance with the best practice of the trades in a thorough, workmanlike manner by competent, skilled technicians and trade personnel.

E. Contractor must provide a competent, experienced full-time Superintendent who is authorized to make decisions on behalf of the Contractor.

F. All labor, materials, apparatus and appliances essential to the complete and proper functioning of the systems described and/or indicated herein, or which may be reasonably implied as essential, whether mentioned in the Contract Drawings and specifications or not, must be furnished and installed by the Contractor. The entire installation must be ready in every respect for the satisfactory and efficient operation when completed.

G. In cases of doubt as to the work intended, or in the event of need for explanation thereof, request supplementary written instructions from the Commissioner.

H. Prior to commencing with the fabrication and/or installation, shop drawings must be prepared and approved, and the work specified herein and shown on the Contract Drawings must be coordinated with all other trades.

I. Contractor must be responsible for material and workmanship until completion and final acceptance. Replace any of same which may be damaged, lost or stolen, without additional cost to the City of New York. Guard the building and its contents against damage by the Contractor, employees or subcontractors, and make good any damage free of charge.

J. Provide signs required by the City of New York.

K. Provide all rigging required for complete installation and furnish drawings showing necessary points of support, reactions and supplementary bracing. This will be submitted for approval by the Commissioner. Should any shoring be required, provide same after the Commissioner’s approval. Rigging plan must be provided to the Commissioner for review prior to scheduling rigging. Rigging plan must be stamped by a Professional Engineer licensed in the State of New York.

L. Become thoroughly acquainted with the work involved and obtain and verify at the building all measurements necessary for the proper installation of work. Furnish to other trades any information

relating to work of this division necessary for the proper installation of their Contracts. Confer with other trades for finish adjacent to work of this division and arrange to have visible portions of the work (such as access doors, grilles, escutcheons, etc.) fit in with the finish in a manner satisfactory to the Commissioner.

M. Certain materials may be furnished, installed or furnished and installed under other sections of the specifications. Examine the Contract Documents to ascertain these requirements.

N. 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.

O. Transmit to trades doing work of other divisions all information required for work to be provided under their respective divisions (such as water connections, foundations, electric wiring, access doors and the like) in ample time for installation.

P. Wherever the Contractor's work interconnects with work of other trades, the Contractor must coordinate the work with these trades to ensure that all trades have the information necessary so that they may properly install all the necessary connections and equipment. Identify all work items (valves, dampers, pull boxes, etc.) in an approved manner in order that the other trades may know where to install such items such as access doors, panel, etc.

Q. Where disagreements occur between the plans and the specifications or within either document itself, the item or arrangement of better quality, greater quantity or higher cost will be included in the Base Bid.

R. Provide required supports and hangers for piping, ductwork, conduit and equipment, so that loading will not exceed allowable loadings of structure. Contractor must ascertain the allowable loadings and include in the estimates the costs associated in furnishing required supports.

S. Set all inserts in ample time to allow the work of the other trades to be performed on scheduled time.

T. 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. Coordinate this work with the Commissioner in order to expedite and properly perform this work.

U. Field drilling, cutting and/or reinforcing of holes in structural metal deck required for work under this division must be coordinated and approved by the Commissioner. All such drilling, cutting and reinforcing costs must be borne by the Contractor.

V. Should the Contractor 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 the Contractor.

W. Architectural drawings must be checked for ceiling height requirements.

X. Due to the type of installation, a fixed sequence of operation is required to properly install the complete systems. It must be the responsibility of the Contractor to coordinate, protect and schedule the work with other trades in accordance with the construction sequence.

1.8 CUTTING AND PATCHING

A. Provide all cutting and rough patching required for systems and equipment included in these specifications. All finish patching will be done under General Construction work.

B. Provide all sleeves and inserts required before the floors and walls are built; Contractor is responsible for the cost of cutting and patching required for pipes where sleeves and inserts were not installed in time, or where incorrectly located. Provide all drilling required for the installation of hangers.

C. All holes cut through concrete slabs or arches must be punched or drilled from the underside. No structural members will be cut without the written approval of the Commissioner.

D. Contractor will not do any cutting that may impair strength of building construction. No holes, except for small screws, may be drilled in beams or other structural members without obtaining prior approval. All work must be done in a neat manner by mechanics skilled in their trades and as approved.

E. Provide sleeves and fire stopping at piping and ductwork floor, wall and roof penetrations in accordance with recognized standards.

1.9 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Procedure:
1. Prepare a schedule of specific submissions at the outset of the Project for the Commissioner’s review and approval; make submissions listed below and in the other Sections of Division 23 of the Specifications.
    a. If submissions listed in other Sections of Division 23 are more specific than those listed below, comply with the more specific requirements.
    b. Failure of the Contractor to submit Shop Drawings in ample time for checking will not entitle the Contractor to an extension of Contract time, and no claim for extension by reason of such default will be allowed.
    c. Piecemeal submittals are unacceptable and will not be reviewed. No submittal will be considered for review, the review of which is contingent upon acceptance of other features for which submittals have not been submitted.
    d. Submittals from Vendor without Contractor’s review and approval stamp will not be reviewed.
    e. Submittals will not be used by the Contractor as a means to secure approval of a substitution. Contractor must indicate all deviations, omissions and substitutions in the submittal; if there are none of these 3 exceptions, Contractor must then state on the submittal: “No Exception Taken” and it will be assumed to fully comply with the contract documents. Any submittal without stated exceptions, or without statement that no exception is taken will not be reviewed and will be rejected and returned to the Contractor for rectification.
    f. All products of a similar nature (i.e., diffusers, air handling units or variable speed drives) will be provided by a single manufacturer.

C. Shop Drawings:
1. Manufacturer's Drawings:

a. Submit equipment listed in all applicable Sections - include material specifications, operating characteristics and finishes, specified agency listings or approvals.
b. Cuts, brochures or other literature submitted for expeditious approval, but incomplete or missing items of hardware or software (performance data) will be re-submitted until all system or equipment components have been reviewed and approved. Any item not included in the original or first submission will be considered outstanding work until such item of equipment or work has been submitted or installed in place exactly conforming to the intent of the contract documents.
c. Contractor must provide preliminary layout drawings of all major pieces of equipment (i.e., boilers, chillers, cooling towers, air handling units), confirming that the submitted product physically fits within the architectural enclosures. This drawing is required along with the manufacturer's product data.
d. Contractor is responsible for all costs related to substitutions as they affect other trades.

2. Installation Drawings:
a. Furnish coordinated drawings of equipment installation, including interconnecting piping and ductwork. Minimum scale for these drawings must be 3/8-inch equals one foot.
b. Coordinate space requirements for electrical, plumbing and other trades in the vicinity of work.
c. Include connections, anchorages and fastenings for piping, conduit and ductwork.
d. Do not install any piping conduits or ductwork, in any area, prior to obtaining approval of its layout by means of submitting shop drawings.
e. Any missing items of equipment, material or labor, during initial submission of shop drawings, are to be completed and re-submitted for final approval. Shop drawing should not be used as a vehicle for obtaining variances, deviation or omission from the scope of contract documents. Approval of a submittal must pertain to the portions that conform to the intent of the contract documents.
f. Submission of any missing, incomplete or otherwise deviant layout is subject to re-submission until all contract requirements have been properly included or shown on the same layout.
g. Submit drawings indicated on equipment, piping and ductwork loads to the Commissioner for review.

D. Required Samples:
1. Color samples, for prefinished items.
2. Natural finish metals, for quality of finish.
3. As requested in other sections of Division 23.
4. Thermostats or space sensors.

E. Reports:
1. Compliance with listings and approvals for equipment and for fire ratings.
2. Acceptance certificates from the City of New York.
3. Complete printed and illustrated operating instructions where required in report format.
4. Manufacturer's pressure tests on vessels.
5. Manufacturer's performance tests on operating equipment.
6. Field pipe testing reports.
7. Welder's certificates and field test reports.
8. Field operating test results for operating equipment.
9. Performance report on the balancing of air and water systems.
10. Performance reports for vibration isolation equipment.
11. Manufacturer's reports on motorized equipment alignment and installation.

12. Additional reports as noted in other sections.

F. Specific references to any article, device, product or material, fixture or item of equipment by name, make or catalog number must be interpreted as establishing a basis of cost and a standard quality. All devices must be of the make and type listed by Special Agencies, such as the Underwriters' Laboratories, and where required, approved by the Commissioner.

G. Contractor will be responsible for any deviations in equipment size, motor horsepower and access requirement, from specified products, including coordination with and costs associated with the related work of other Trades.

1.10 COORDINATION

A. Contractor must prepare preliminary shop drawings suitable for use in coordinating the work with the work of other trades. The HVAC Section must prepare and furnish background with ductwork at 3/8" = 1'-0" scale for all trades to indicate piping, cable tray and conduit in relation to all structural elements of the construction, including floor elevations; steel locations, size and elevations; partitions locations; door locations and direction of swing; and all other information required to assure coordination of the electrical, sheetmetal and piping trades and fire protection in relation to the Architectural function of the project. Coordination meetings must be held under the supervision of the Commissioner. Each trade must have proper representation at all coordination meetings for the purpose of detailing, on the drawings mentioned above, the exact location and routing of their work. After the conclusion of the coordination at the working meetings, each trade must sign the coordinated originals, copies of which will be distributed by the Contractor. Final shop drawings of all trades must be in accordance with the coordinated drawing, after which final shop drawings will be submitted for final approval.

B. If the Contractor installs work so as to cause interference with work of other trades, the Contractor must make necessary changes in work to correct the condition without extra charge.

C. Dimensional layout plans of equipment rooms must be made showing all bases, pads and inertia blocks required for mechanical equipment. Include dimensions of bases, bolt layouts, details, etc.

D. Contractor must furnish all necessary templates, patterns, etc., for installing work and for purpose of making adjoining work conform, furnish setting plans and shop details to other trades as required.

1.11 CONCRETE AND GROUTING

A. Requirements for concrete and grouting are specified in other Sections.
   1. Concrete must be 3,000 psi stone concrete with water reducing admixture, except where otherwise specified.
   2. Concrete must have air entraining admixture where exposed to weather.

B. Contractor must make coordinated layouts showing concrete work required for housekeeping pads, roof curbs, thrust blocks, etc. which are cast in place.

C. Concrete housekeeping pads: 4" minimum thickness, sized to cover the full area of each piece of equipment and access area provided under Concrete Work.

D. Concrete bases: Dimension and height to suit the equipment.

E. Concrete inertia blocks for vibration isolation. Dimensions designed by the vibration isolation equipment manufacturer and inertia block provided by Division 23, under Mechanical work.

F. Outside the building, all concrete work related to mechanical equipment must be coordinated by Division 23, unless otherwise noted in the Contract Documents.

1.12 ACOUSTICAL PERFORMANCE OF EQUIPMENT AND SYSTEMS

A. Noise levels from operation of motor driven equipment, whether airborne or structure-borne, and noise levels created by or within air handling equipment and air distribution and control media, are not to exceed sound pressure levels determined by the noise criteria curves in the ASHRAE Guide and as noted under Section 23 05 48.

B. Acoustical Tests:
1. The Commissioner may require the Contractor to conduct sound tests for those areas or equipment that are deemed too noisy.
2. If NC level in any space exceeds that in the schedule or the specification due to improper installation or operation of mechanical systems, the Contractor is required to make remedial changes or repairs.
3. Contractor is required to retest until specified criteria has been met.

1.13 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Instructions and Demonstration for the City of New York's Personnel:
1. After all equipment is functioning properly, each system is to be automatically operated for ten (10) working shifts, and not to be adjusted during this period, 80 hours in heating and 80 hours in cooling seasons, and 80 hours during "shoulder" or "swing" seasons scheduled at the convenience of the City of New York. Any adjustments will void the test and start the time period all over again.
2. The hours of operation are to include the City of New York's designated personnel in each shift, for each season.
3. During this period, instruct the City of New York's personnel in the use, operation and maintenance of all equipment of each system. Lesson will include lecture-type instruction given in a non-machine room environment. During the lesson, normal operation of the system installed, and operating will be explained, along with troubleshooting procedures. This will be followed by a field inspection and demonstration of equipment.
4. The above instruction is exclusive of that required of specified equipment manufacturers. If more stringent or longer instruction is indicated for specific equipment or systems, these will supersede the above requirements.

B. Operating and Maintenance Data:
1. Provide four (4) complete sets of manufacturer's catalogues, instructions, maintenance and repair information and parts lists for operating equipment and devices. Include one (1) CD with a PDF file with all required documentation.
   a. Include performance curves for fans and pumps, factory-furnished wiring diagrams and control diagrams, and applicable flow diagrams.
   b. Submit seven sets of instructions for distribution.
2. Data for the equipment actually installed is to be submitted.

3. The data is to be carefully checked for accuracy by comparison with the installed equipment nameplates.
4. Provide a recommended list of spare parts for equipment and list of special, non-standard tools to service equipment.
5. Index and assemble the instructions in durable loose-leaf binders.
6. The completed binders are to be available at the time the equipment installation begins.
7. In addition, follow all requirements of DDC General Conditions.

1.14 RECORD DRAWINGS

A. Provide and maintain a currently up-to-date record set of reproducible prints showing all changes, additions or omissions made during construction. Contractor must produce the Record Drawings.

B. Deliver four (4) sets of all as-built drawings and one (1) set of reproducible of the record drawings to the City of New York.

C. Shop Drawings must be cross-referenced on the mylar copies for this requirement where applicable.

D. Submit AutoCADD, or other as required by the City of New York, compatible as-built drawing files.

PART 2 - PRODUCTS

2.1 IDENTIFICATION MARKINGS

A. Every equipment valve, damper, control, and apparatus installed under this Contract must be tagged, labeled or stenciled as follows: Tags and labels securely fastened by brass chains, screws or mastic as applicable. Equipment controls numbered according to equipment schedules on Plans. Tags numbered to conform to a directory listing number, location and use. Directories to be mounted under glass in aluminum self-closing frames, 8-1/2" x 11" in size.
   1. Apply identification after testing, insulation and field painting are completed.

B. Valve Identification:
   1. Provide an identification tag for each valve, including control valves.
   2. Differentiate between the different classes of service in the numbering systems; as an example: “CHW-II”, “HW-II” or “CW-II”.
   3. Use 2" brass tags stamped with designation numbers 1" high, filled in with black enamel.
   4. Attach tags securely to handles or spindles of valves with heavy brass "S" hooks or brass chains.
   5. Provide six copies of valve charts with one of each framed under glass and mounted where directed.

C. Piping Identification:
   1. Provide on bare and covered pipes for all services.
   2. Use a system of marking and colors conforming to ANSI A-13.1.
   3. Install to provide permanent adhesion.
   4. Install in readily visible location.
   5. Apply legend and flow markers as required for maintenance purposes, with at least one marker in every 50'-0" of each line and at every change of direction.

6. Color Coding of Piping: After piping has been finish painted, the installer of the piping must identify the type of service lines with applied color bands and stenciled letters. The direction of flow must be indicated with stenciled arrows. Color bands must be 1-inch wide, finished in gloss enamel; lettering and arrows must be same color as the bands. Specify that indicators be applied at connections to pumps, chillers, and other equipment; at entrances to spaces; adjacent to valves; near access doors to pipe spaces; and at maximum intervals of 50 feet on long pipe runs and at each change of direction. Specify that letters be positioned to be easily read from a normal standing position. If there is no New York's standard for color code and designation, the following colors and letter designations must be used:

HVAC PIPING

Service	Color	Designation
Pumped Condensate	Yellow	PR
Chilled Water Supply	Blue	CHWS
Chilled Water Return	White with 2 blue vertical stripes 15'-0" o.c.	CHWR

D. Equipment Identification:
1. Provide stencil lettering on operating equipment and units:
   a. Use black oil base paint, except where equipment finish is dark, use white paint.
   b. Make all characters distinguishable from the floor, but not less than 2" high.
2. For each motor starter, controller and similar accessory provide a lamicore nameplate attached with screws or rivets to a fixed part of the equipment in a visible location.
   a. Make plates not less than 2" x 1" x 1/8" thick with 1/4" high characters.
   b. Designations for equipment tags must match contract schedules.
3. Equipment such as fans, tanks, ducts, access doors to equipment such as filters, coils, fans, neatly stenciled with letters not less than 1 inch high. Any equipment too small to receive such stenciling must be provided with brass name tags 2" x 1" in size.
   a. Label ducts by function (supply air, return air, exhaust air and transfer).
4. In areas where removable ceilings occur, install appropriate color-coded tile markers to indicate location of valves and other equipment or fittings that may require maintenance service.

E. Refer to Section 23 05 53 for additional requirements.

2.2 PROTECTION OF ELECTRICAL EQUIPMENT

A. Keep piping 2'-0" outside the vertical line of unprotected electrical equipment or provide non-corrosive metal (soldered 20-gauge copper or welded stainless steel), watertight support, pans piped to an open drain.
1. Construct and support pans to hold minimum depth of 3 inches of water.

2.3 ACCESS DOORS

A. General:
1. Steel, flush four-sided frame and door assembly, chemically cleaned after fabrication and painted with rust inhibitive primer.
2. Provide hardware and locking devices.
3. Provide access doors required for access to mechanical work through finished wall construction and non-removable ceiling construction.

4. Deliver doors and location information to appropriate trade for installation.

B. Furnish for installation by the appropriate trade, flush type access door or panel no smaller than 18" x 18" and no larger than 30" x 30" for all dampers, valves, cleanouts, or apparatus located in chases, walls, non-accessible hung ceilings or floors; finish must be prime coat, except floor panels which must be polished brass or chrome plate. Doors and trim 14-gauge steel, frame 16-gauge steel, with flush concealed and standard flush locks, screwdriver operated cams.
   1. All panels and their exact location subject to approval of the Commissioner.
   2. Furnish a complete list locating all access doors required in finished walls, ceilings, partitions, shafts and other inaccessible locations.

2.4 PRIME PAINTING

A. All piping, supports, auxiliary steel and miscellaneous iron within all MER's must be prime painted as specified herein.

B. All exposed uninsulated piping, fittings, equipment stands, supports, platforms, cradles, and hangers; except chrome finished materials, must be painted. All ungalvanized surfaces must be painted with zinc chromate, or approved equal, and all galvanized surfaces must be prime coated with a phosphate pretreatment coating, dry film thickness of 0.35 with a 0.50 mil. one coat galvanized primer.

C. Upon completion of the prime coat of all mechanical equipment specified above, all insulated and exposed piping must be painted with finish coating, as specified under Division 9. This Section must complete stenciling and color identification, specified under Division 23, following the finish painting.

D. Except where otherwise specified, steel piping in concrete and buried steel piping and steel tanks:
   1. Provide factory-applied anti-corrosive polyurethane coating, minimum 15 mils thickness which complies with UL 1746, Parts I and IV.
   2. In accordance with NFPA and all applicable codes.

E. Provide factory finishes, except as noted, to match Commissioner’s color samples, for items appearing in exposed finished work, and including:
   1. Equipment
   2. Registers and grilles
   3. Diffusers
   4. Enclosures on equipment
   5. Thermostat Covers

F. All damaged, factory-painted surfaces must be repaired to match original surface. If, in opinion of the Commissioner, such repairs are unsatisfactory, item in question must be completely refinished or replaced with new.

2.5 WELDING

A. General:
   1. All welding procedures, welders, and welding operators must be qualified in accordance with the requirements of ASME/ANSI B31.9 and Section IX of the ASME Code, latest editions.

2. Welding procedures must be reported on ASME Section IX Forms "QW," or its equivalent. Joint preparation sketches (to be included with the welding procedures) must show all dimensions including tolerances, for bevel angle, land size, offset and root gap.
3. Contractor will be responsible for the welding performed by personnel of the organization and will conduct the required qualification tests and submit results to the Commissioner for review and approval.
4. All welding procedures must meet requirements of New York City Fire Department Certified Requirements. The filing of MSDS form will be held in the field office.
5. A copy of the welder's and fire watch certificate will be held in the field office of the site.

B. Processes:
1. Employ the Manual Shielded Metal-Arc (SMAW) welding process.
2. Double butt welding must be permitted on all joints accessible from both sides. Where double butt-welding is employed, the first root pass must be back-chipped.
3. Welding of pressure parts must be performed with low hydrogen type electrodes. Electrodes of Classifications E6012, E6013, E7014 and E7024 must not be used.
4. Brazing and Soldering:
   a. The Contractor must prepare applicable "Brazing and Soldering Procedures" forms for approval of the Commissioner.
   b. Brazing must conform to ASME Section IX.
   c. Soldering must conform to the relevant procedures in the manuals of the Copper Development Association.
   d. For all refrigeration piping, the mechanics must be skilled and specially trained in this type of pipe joining.
   e. The Commissioner may reject any brazed or soldered joint for lack of penetration or for other applicable grounds. These defective joints must be redone until satisfactory.

C. Quality of Workmanship - In addition to conformance with the procedural and quality requirements set forth in the NYC Building Code or material specification, all welding must meet the following requirements.
1. Butt welds must have full penetrations and must be slightly convex with uniform height.
2. Each weld must be uniform in width and size throughout its full length.
3. Each layer of welding must be smooth, free of slag, cracks, pinholes, undercut in excess of 1/32" and completely fused to adjacent weld beads and base metal.
4. Cover passes must be free of coarse ripples, irregular surface, non-uniform bead patterns, high crown, and deep ridges or valleys between heads. The surface smoothness of the finished weld must be suitable for the proper interpretation of non-destructive examination of the weld.
5. Surfaces of parts to be joined by welding must be cleaned of all oil, grease, paint, scale and rust with solvent and/or wire brushing.
6. Fillet weld size must be in accordance with the NYC Building Code or as specified on the drawings with full throat and legs of equal length.
7. Welding filler metal and welding flux must be properly stored in such a manner as to ensure that no damage to the coating or corrosion of weld rod will occur. Low hydrogen type electrodes must be stored in enclosures which provide a regulated temperature as prescribed by the electrode manufacturer. All electrodes must be properly identified.
8. Socket welds must have a gap of approximately 1/16" between the bottom of the socket and the end of the pipe prior to welding. Socket welds must have a minimum of two weld layers.

9. Welds for steam piping must be X-rayed in accordance with NYCBC requirements. Submit results of X-ray analysis for approval.

D. Repair and Weld Defects:
1. A weld is defective and must be repaired if it does not meet the acceptance standard of each applicable non-destructive examination as defined ASME/ANSI B31.9, latest edition.
2. Repairs must be made in accordance with ASME/ANSI B31.9, latest edition.

E. Welding Identification and Weld Marking:
1. All welds must be identified with the welder's identifying symbol. Welds, where more than one welder performs the work, must be stamped by each welder.
2. Marking must be done by a permanent method that will not result in sharp discontinuities.
3. Where stamping or marking on the base materials is not practical or feasible, permanently affixed metal bands of the same material may be applied. Stamping or any method of permanent marking on the bands is acceptable.

2.6 EQUIPMENT AND SYSTEMS CRITERIA

A. The criteria of design and performance to produce the required operation is based on equipment shown or scheduled, and as specified.

B. Equipment of other manufacturers will be considered, subject to its acceptability and the following:
1. The equipment must conform to the structural design provisions for loads applied to the structure; to the dimensions established by drawings for spaces and other (service, etc.) clearances; and for inlet and outlet locations and relationships to associated equipment, piping and ducts.
2. Changes to the building arrangement or structure, which are required to suit equipment offered, must be by the Contractor at no extra expense to the City of New York.
3. Changes to the electrical requirements such as circuit breaker or starter size, conduit or wire size must be coordinated by the Contractor with no additional cost to the City of New York.
4. Changes to other Contractor’s scope of work will be the responsibility of the Contractor, at no additional cost to the City of New York.

C. Operating equipment, operating systems and other products are specified by names and models and also by performance criteria standards:
1. Where both specifying media are employed, the names and models establish a standard for manufacturing quality, while the performance criteria governs the capacity, rating or output.
2. In any question regarding intent, the capacity, rating or output which is compatible with the other systems, is intended to be of prime concern and is to be provided.
3. Contractor must follow NYCBC Standards for Turn-Over Acceptance, Commissioning and Testing. Where there is a conflict between these requirements and Building Department’s requirements, the more stringent requirements will apply.

D. The descriptions of equipment and systems cover basic equipment and operation, but not all the details of design and construction.
1. The use of singular in descriptions does not limit the quantities to be furnished to produce the complete system, together with the results specified.
2. Furnish equipment required to provide specified performance under installed conditions.
3. Factory wiring and piping is to conform to specifications for field work, unless otherwise specified.

4. Provide trim, enclosures, transition pieces and accessories required to make complete installation in each instance.

E. All Mechanical Drawings of Division 23 are schematic and diagrammatic.
1. Symbols and diagrams are used to indicate the various items of work and the complete systems, but they do not necessarily have dimensional significance, neither do they necessarily include all related and subsidiary parts and equipment. Contractor must provide all parts, elements, transition pieces, etc. as required for a complete and operational system.
2. The work is to be installed complete and ready for operation in conformity with the intent expressed on the Drawings and in the Specifications.
3. Coordinate work with the requirements of the Architectural and Structural drawings for dimensions, locations and clearances.
4. Locations of mechanical and electrical items which are exposed to view must be taken from the Architectural Drawings where available or are to be located as directed by the Commissioner.
5. Contractor must provide all transition pieces and rises/drops for piping and ductwork.
6. Minimum height of piping, ductwork, valves, etc. in mechanical rooms excluding drops to equipment, must be 7’-0” unless otherwise noted.

2.7 EQUIPMENT INSTALLATION

A. Locate and set equipment anchor bolts, dowels and aligning devices for equipment requiring them.
1. Level and shim the equipment; coordinate and oversee the grouting work.
2. After one week of continuous operation, the technician will return to check and realign all shafts, bearings, seals, couplings and belt drives as needed. Provide report indicating completion of this work.

B. Field assembly, installation and alignment of equipment is to be done under field supervision provided by the manufacturer or with inspection, adjustments and approval by the manufacturer, as a part of the work.

C. Alignment and Lubrication Certification for Motor Driven Apparatus:
1. After permanent installation has been made and connections have been completed, but before the equipment is continuously operated, a qualified representative of the manufacturer is to inspect the installation and report in writing on the manufacturer's letterhead as follows:
a. That shafts, bearings, seals, couplings, and belt drives are perfectly aligned and doweled so the equipment will remain perfectly aligned in the normal service intended by the Documents and that no strain or distortion will occur in normal service. All dowels must be aligned after equipment is running.
b. That all parts of the apparatus are properly lubricated for operation.
c. That the installation is in accordance with manufacturer's instructions.
d. That suitable maintenance and operating instructions have been provided for the City of New York’s use.

D. Belt Drives:
1. V-belt drives must include a driving and driven sheave grooved for belts of trapezoidal cross-section. Belts must be constructed of fabric and rubber so designed as not to touch the bottom of the grooves, the power being transmitted by the contact between the belts and V-shape groove sides. Drives must be designed for a minimum of 150 percent of motor horsepower. Drive sheaves must be of the companion type.

2. All motors must be provided with fixed sheaves once the correct speed is determined during testing/balancing period.
3. All fans must be installed with fixed pitch sheaves on their drive motors. Sheaves must be selected to provide air quantities under specified conditions. Air systems must be put into operation, and the Contractor must determine actual size of sheaves required to produce specified air quantities on installed systems via the use of adjustable sheaves. Adjustable pitch sheaves must then be replaced with the proper size fixed sheave. Adjustable pitch sheaves will be property of Contractor and removed from premises.

E. Machinery Guards:
1. Motor drives must be protected by belt guards furnished by the equipment manufacturer or in accordance with the Sheet Metal and Air Conditioning Contractors National Association's Duct Manual. In all cases, guards of all types must be as approved as acceptable under OSHA Standards.

F. Equipment Startup:
1. Each equipment manufacturer is to provide qualified personnel to inspect and approve equipment and installation and to supervise the startup of the equipment and to supervise the operating tests of the equipment.
2. If a minimum number of hours for startup and instruction are not stated with the equipment specifications, these will be 2 full 8-hour working days as a minimum.
3. Advise the Commissioner of startup at least 72 hours in advance.

G. Equipment Turn-Over:
1. Contractor must follow New York City’s Standards for Turn-Over Acceptance, Commissioning and Testing. Where there is a conflict between these requirements and the regulations by the NYC Building Code, the more stringent requirements will apply.

2.8 CLEANING AND ADJUSTING

A. Notification:
1. Inform the Commissioner of all cleaning, blowing out and fill-up schedules one week prior to starting.
2. Notify the Commissioner again, 48-hours prior to each event. If the Commission does not attend the procedures, notify in writing, the specific task performed 24-hours after each event.
3. Leaks appearing during the various pressure tests must be corrected by replacing all defective materials or welds and subsequent tests will not be made until the piping is found in perfect condition. Caulking of screwed joints or peaning of welds is prohibited. Wherever it is necessary to cut out a weld and the ends of the pipe cannot be conveniently brought together, then a short piece must be fitted in and welded.
4. Damage to the building and equipment resulting from tests must be repaired at no additional cost to the City of New York.
5. Tests claimed to have been performed without the following above procedures will be deemed as not performed.

B. Cleaning:
1. Blow out, clean and flush each piping system and equipment, to clean thoroughly. MSDS forms for clean agent and procedure must be presented to the field office. After cleaning, the systems must be tested by an independent organization, approved by the Commissioner prior to testing.

2. Clean all materials and equipment; leave in condition ready to operate and ready to receive succeeding finishes where required.
3. Clean the operating equipment and systems to be dust free inside and out.
4. Clean concealed and unoccupied areas such as plenums, pipe and duct spaces and equipment rooms to be free of rubbish and dust.
5. After completion of all pressure tests, properly clean every piece of apparatus furnished and remove caps and other provisions made for testing purposes only.
6. All pipe strainers must be removed and cleaned upon completion of blowdown period.
7. After this period of operation, all systems must be drained and refilled with fresh water and new chemicals as specified.
8. All equipment installed must be thoroughly cleaned in preparation of the finished painting.
9. All dowels must be aligned after system is running.

C. Adjusting:
1. Adjust and align equipment interconnected with couplings or belts. After one week of continuous operation, the technician will return to check and realign all shafts, bearings, seals, couplings and belt drives as needed. Provide report indicating completion of this work.
2. Adjust valves of all types and calibrate equipment of all types to provide proper operation.
3. Clean all strainers after system cleaning and flushing and again before final system startup.
4. Motors, fans, pumps, compressors, etc. must be properly oiled and left ready for operation.
5. Verify that each and every supply and return and exhaust fan, each fan coil unit fan, motor and automatic control valve is in running condition. All equipment must be cleaned, including coils, motors, housing, pans, etc. and inspected by the Commissioner.
6. Submission of certified tests will, in no way, relieve the Contractor of fulfillment of guarantee.
7. Gauges, instruments, thermometers and meters must be checked and tested to specified accuracy.
8. Alarms must be tested to fulfill satisfactory operating conditions.
9. Allow sufficient time to perform all tests, adjustments, etc., necessary to place the various systems in final operating condition, verify performance requirements and check all safety devices. Labor, instruments, etc., required for various tests must be furnished by the Contractor. The Contractor must see that all the subcontractors, manufacturer's representatives or Field Engineers necessary to check and adjust various systems are present, with sufficient forms, and that all test results are recorded properly and turned over to the Commissioner for approval.
10. The Commissioner will make final check for all systems only after Contractor has completed and returned to the City of New York all recorded test data together with letter that the work is 100% complete. Additional tests may be required to meet the requirements of the City of New York's documents for demonstration of various systems, whether or not specified, to verify performance, workmanship or for adjustments.
11. Unless otherwise specified, equipment must be installed and adjusted in accordance with manufacturer's recommendations to function properly with capacities required or specified.
12. Provide adjustments during summer, winter and shoulder/swing seasons.

D. Running Test of Piping Systems:
1. Any section of the work, after it has been completed and otherwise satisfactorily tested, will be put in actual operation and operated by the Contractor for a period of 2 days of 24 hours each, during which time any defects which may appear must be remedied and any necessary adjustments must be made. Test must be performed in the presence of the Commissioner and serve as part of the Instructions Program.

2. During the time of the tests, repack all valves, make all adjustments and otherwise put the apparatus in perfect condition for operation, and instruct the City of New York in the use of management of the apparatus. All joints must be made absolutely tight under tests. Caulking of pipe joints or makeshift methods of repairing leaks will not be allowed. Piping which is not tight under tests must be taken down and reassembled.
3. All gauges, thermometers, alarms, instruments, etc. must be tested to demonstrate that they are functioning properly and within the range of these devices, and to show their degree of accuracy.
4. If during the first test run, the system cannot be completely vented within 24 hours, install additional air vents at high points of system to facilitate quick venting of all water systems.

E. Permanent Equipment Operating During Construction:
1. Use only in same service as the permanent applications, provided that written approval is granted by the Commissioner.
2. Use disposable filters during temporary operation.
3. Expendable media, including belts used for temporary operation and similar materials are to be replaced just prior to acceptance.
4. Packings in equipment operated during construction must be repacked just prior to system acceptance, using materials and methods specified by the supplying manufacturer.

F. Retouch or repaint equipment furnished with factory finish as required to provide same appearance as new.

G. Tools:
1. Provide one set of specialized or non-standard maintenance tools and devices required for servicing the installed equipment.

H. Fan and Pump Characteristic Charts:
1. Fan Characteristic Charts: Furnish 4 characteristics curve charts for each fan, including those embodied in factory assembled units. Characteristic curve charts must not be less than 8-1/2” x 11” and must show the static pressure, capacity, horsepower and overall efficiency for operating conditions from no load to 130% specified load.
2. Pump Characteristic Charts: Furnish 4 characteristic charts for each pump. Charts must be not less than 8-1/2” x 11” showing head developed, efficiency and power required for varying capacities at the operating speed of the equipment.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

A. Temporary Protection:
1. Provide and maintain protection for the work whether completed or in progress.
2. Provide suitable coverings and enclosures.

B. Scaffolding, Rigging and Hoisting:
   1. Provide all scaffolding, rigging and hoisting services necessary for erection, and/or delivery into the premises, of any equipment and apparatus furnished. Remove from the premises when no longer required.

C. Waterproofing:
   1. Where any work pierces waterproofing, including waterproof concrete, the method of installation must be as approved by the Commissioner before work is done. The Contractor must provide all necessary sleeves, caulking and flashing required to make openings absolutely watertight.

3.3 EQUIPMENT BASES, PLATFORMS AND SUPPORTS

A. Provide supporting platforms, steel supports, anchor bolts, inserts, etc., for all equipment and apparatus requiring access for service and maintenance.

B. Obtain prior approval for installation method of structural steel required to frame into building structural members for the proper support of equipment, conduit, etc. Welding will be permitted only when approved by the Commissioner.

C. Submit shop drawings of supports for approval to the Commissioner before fabricating or constructing.

D. Provide leveling channels, anchor bolts, complete with nuts and washers, for all apparatus and equipment secured to concrete pads and further supply exact information and dimensions for the location of these leveling channels, anchor bolts, inserts, concrete bases and pads.

E. Where supports are on concrete construction, care must be taken not to weaken concrete or penetrate waterproofing.

3.4 ACCESSIBILITY

A. The installation of valves, dampers and other items must be conveniently and accessibly located with reference to the finished building floors, walls, roof and penthouses as applicable.

B. In-line pumps must not be installed higher than 7 ft. above floor and must be fully accessible for servicing its motor, valves, controls and instruments.

C. Equipment removal, tube-pull access door swing spaces must be identified on shop drawings and maintained during installation.

3.5 MODIFICATIONS TO EXISTING WORK

A. Contractor must perform all work as shown or as specified, within the existing site and structures as part of this Contract without detriment to the existing systems or equipment to be kept in operation or maintained in their places.

B. For full extent of modifications to be done to existing systems, Contractor must inspect existing systems and site conditions to become familiar with the complexity of the work related to removals and relocations required, and the existing finishes to be preserved without any damage resulting from possible careless

installation procedures. Upon written request by the bidders, the Commissioner will make the existing schematic plans available for inspection without any responsibility for their completeness or accuracy.

C. As-Built drawings are not available on the existing installations. Any drawings that may be available to the Contractor are for information only. All field criteria must be field verified by the Contractor.

D. All cutting must be done only by mechanics skilled in the particular trade which is affected. No cutting will be done without proper protections against damage, dirt and dust resulting therefrom or without proper safeguards to workmen, the public, and occupants of buildings.

E. Before cutting is started in any location, Contractor must carefully investigate conditions influencing human and structural safety. Existing piping, wiring and items concealed in walls and slabs, wherever these walls and slabs are removed, must be properly relocated, rerouted or removed as the case may require.

F. General Construction trades will perform all finish masonry, repairing, restoring and finishing of all cut openings, closing up of existing openings, and removing and restoring the affected sections of the suspended ceilings.

G. If, during partial occupancy of the building, circumstances necessitate temporary shutdown of any facilities or otherwise interfere with access to building, the Commissioner must be given a minimum of 48 hours' notice before doing such work.

H. In all areas where interface, relocation or alternation work is to be done, Contractor must disconnect and remove from the premises all existing ductwork, piping, etc., that will not be required to remain in service after the alterations are completed. All such equipment (except as requested as salvage by the Commissioner) will become the property of the Contractor and must remove same from the premises immediately upon disconnection. Existing ductwork, piping, etc., being removed must not be reused.

I. Contractor must move or relocate any existing mechanical equipment, piping, ductwork, etc., which may temporarily interfere with the construction, (to a temporary location) if the existing equipment is to be kept in operation during construction. The Contractor must also install temporary piping, ductwork or equipment that might be required (during demolition or excavation and during the construction of tunnels, retaining walls, footings or columns) for offsetting all piping around the construction area in order to maintain services to the existing systems. Provide temporary piers, supports and hangers as required for excavation.

J. The trade in charge of concrete and superstructure must provide all cuts and openings through structural slabs and walls, except for core drillings for passage of piping. Contractor must coordinate the work with concrete contractor and provide necessary dimensions for all openings.

K. Upon completion, remove all temporary piping and equipment, shoring, scaffolds, etc., and leave all areas clean and free from material and debris resulting from work performed under this Section. Provide rough patching in areas shown.

L. Test all piping to be retained or shown to be re-used together with the new extensions connected to them. Install isolation valves as required.

M. Where a fan or any of its connected ductwork is to be modified, relocated or ductwork extended to a new discharge location, test fan prior to starting work and submit test data to the Commissioner for record purposes. Test same fan following completion of work to verify its final capacity in terms of CFM, Static Pressure and Amperes drawn while in operation, showing compliance to data previously established.

3.6 USE OF EQUIPMENT

A. The use of any equipment, or any part thereof, for purposes other than testing even with the Commissioner's consent, will not be construed to be an acceptance of the work on the part of the Commissioner, nor will it be construed to obligate the Commissioner in any way to accept improper work or defective materials.

B. Use of permanent equipment for temporary services must be approved in writing by Commissioner.

3.7 CODES, RULES, PERMITS & FEES

A. The Contractor must give all necessary notices, obtain all permits and filings including, but not limited to, New York City Department of Buildings, New York State DEC, New York City and State Building Code requirements, and pay all government sales taxes, fees, and other costs, in connection with the work. The Contractor must file all necessary plans, prepare all documents and obtain all necessary approvals of Department of Buildings; obtain all required certificates of inspection for the work and deliver same to the Commissioner before request for acceptance and final payment for the work.

B. The complete design and construction must conform to the requirements of the NYCBC, NYCMC, NYCFC, NYSEC, NFPA, NEC, FM, UL.

3.8 CODE COMPLIANCE

A. As part of this Mechanical work, the Contractor is required to provide assistance to an independent agency for purposes of enforcing code compliance, including special inspections, as follows:
   1. For the entire duration of this construction, provide material and labor required by an independent organization headed by a Professional Engineer licensed in the State of New York for purposes of monitoring compliance with all applicable codes in general and providing special inspection on all items as required by the New York City Building Code, including but not limited to:
      a. Construction of ducts and its accessories including hanger installation.
      b. Air intakes and outlets.
      c. Electrical wiring and equipment pertaining to mechanical equipment.
      d. Air cooling and heating equipment.
      e. Fire and smoke dampers.
      f. Controls.
      g. Heating and combustion equipment.
      h. Monitoring of New York City (OTCR) approvals required for HVAC and Fire Protection equipment.
      i. Structural Concrete poured under this Contract.
      j. Fire stopping at penetrations.
      k. Energy Code Progress Inspections.

B. The independent organization will be responsible for compiling, issuing and submitting to the Commissioner all code required reports and forms.

C. Special inspection procedures will, in general, ensure the following:
1. The adherence of the standards of material and workmanship required by the New York City Building Code.
2. The checking of building processes and the evaluation of materials to ensure conformity with the New York City Building Code.
3. The elimination of unspecified, non-conforming substitutions.
4. The discovery of discrepancies between the New York City Building Code requirements and the final Drawings or Specifications and their early correction.
5. The prevention of error which may result in unnecessary and costly maintenance or upkeep costs.
6. The determination of necessary tests and laboratory work.

D. Regular Inspection Services: Provide a part-time field inspection supervisor qualified to monitor the project for code compliance and having five to ten years previous field experience in supervising similar Mechanical system installations.

E. The following forms will be prepared and filed with the New York City Building Department in order to secure their approvals and permits:
1. Forms PW-1, PW-1B and PW-C: Plan/Work Approval Application
2. Form TR-1: Technical Report Statement of Responsibility
3. Form PW-4: Application for Equipment Use Permit
4. Form TR-8: Energy Code Progress Inspections

F. Also furnish to the Commissioner weekly progress reports. These reports will state the following:
1. The progress of inspections and filing for the previous week.
2. Although discrepancies will be reported to the Commissioner immediately upon discovery, they will be included in the reports, as will the resolution of these discrepancies.
3. Tests witnessed during the week and code items whose installation has been completed during the same period.

3.9 FINAL INSPECTION

A. Contractor must arrange and schedule final inspection of work and must notify the Commissioner in writing that the Contractor has thoroughly checked the work and, in the opinion of the Contractor, is ready for final inspection.

B. During the entire period schedule for these inspections, the Contractor and representatives of each manufacturer of equipment involved must be present. All of these organizations must have sufficient and competent personnel present so that adjustments can be made to all systems without delay.

C. Contractor must recheck equipment after seasonal use to ensure proper operation for summer, winter and shoulder/swing seasons.

3.10 ACCEPTANCE

A. The operation or the temporary use of the equipment and the mechanical and electrical installation, by the City of New York does not constitute an acceptance of the work. The final acceptance is to be made after the Contractor has adjusted the equipment, demonstrated that it fulfills the requirements of the Contract Documents, and has furnished all the required Certificates.

3.11 GUARANTEE

A. Submit a single guarantee stating that all portions of the work are in accordance with Contract requirements. Guarantee all work against faulty and improper material and workmanship for a period of one year from date of Substantial Completion, except that where guarantees or warranties for longer terms are specified herein, such longer term will apply. At no additional cost to the City of New York, within 72 hours after notification, correct any deficiencies which occur during the guarantee period, all to the satisfaction of the Commissioner.

B. Guarantee that the materials and workmanship supplied under this division will be of the best quality currently available, that the equipment will be erected in a practical manner and in accordance with best practices, that it will be complete in operation, nothing being omitted in the way of labor and material required to make this so, although not specifically shown or mentioned herein and that it will be delivered in proper working order, complete and perfect in every respect without additional cost – whether or not shown in detail on the drawings or described in detail in this specification.

C. Be responsible for all damage to or caused by the work performed under this division for a period of one year from date of Substantial Completion. Repair, at no cost to the City of New York, all such damage which occurs within 24 hours' notice thereof by the City of New York. Damage which occurs prior to the completion of this work must be repaired at once. Be responsible for any damage and repair thereof.

END OF SECTION 23 05 00

SECTION 23 05 01 - SCOPE OF HVAC WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

PART 2 - PRODUCTS

2.1 WORK INCLUDED

A. This Specification and the accompanying Contract Drawings are intended to include the furnishing and installation, in a workman-like and approved manner, of all labor, materials, equipment and appliances necessary and required to completely install the HVAC Systems as specified and shown on the Drawings.

B. The list is not intended to be complete, but it is to serve as a guide to the character and extent of the work, and in general, will consist of the following:
   1. Cleaning of all piping and duct systems prior to operation.
   2. All electrical interlock wiring, except as noted otherwise.
   3. Complete Direct Digital Controls and BAS system.
   4. All control and interlock wiring (in conduit) for the BAS loop system and all components.
   5. All miscellaneous appurtenances, accessories and specialties required for a complete installation placed into satisfactory operating condition.
   6. Signs, charts, labels, etc., conforming to the requirements of the specifications and NYCBC.
   7. Supply, return, exhaust ventilation systems and air conditioning systems, including fans, air-handling units, ductwork, motors, dampers, filters, air distribution devices, dampers, and all accessories.
   8. Air-cooled self-contained or split systems.
   9. All drains and drainage systems from HVAC coils and protective drain pans
   10. Motor starters, motor control centers and variable frequency drives (VFD) for the fans and all other mechanical equipment as specified and/or scheduled
   11. Insulation of piping, ductwork, equipment, etc.
   12. Prime painting of equipment and piping, shop finishes, piping identification, stenciling and color coding.
   13. Training, instructions and guarantees.
   14. “Air-Side Economizer Systems” including controls where indicated.
   15. Auxiliary steel required for supporting HVAC equipment, ductwork and piping other than those available in the building structure.
   16. Directing the location of access doors and panels required in acoustical tile hung ceilings and furnishing of all access doors and panels required in plaster or dry wall ceilings and partitions.
   17. Providing template to the General Construction trade for housekeeping pads required under for all floor mounted equipment.
   18. Vibration and inertia bases for fans, pumps, cooling towers, etc., and vibration isolators for all equipment and piping.

19. Counter flashing around roof penetrations or waterproofed floor penetrations of HVAC ducts and piping. Caulking around sleeves and fire-stopping at all floor and wall penetration of piping and ductwork.
20. Sound control and acoustical treatment.
21. Furnishing and setting of sleeves, required for piping or ductwork in walls and/or slabs.
22. Duct cleaning.
23. Testing, Adjusting, Balancing and Commissioning.
24. Install duct smoke detectors as coordinated with the electrical trade.
25. Protection during construction.

2.2 WORK OF OTHER SECTIONS AND/OR TRADES

A. Following work will be performed under other Sections:
1. All concrete and foundation work, including pads and curbs for equipment installation, unless otherwise noted.
2. Weatherproof louvers in outside walls for air intakes and exhaust.
3. Setting of access doors in walls and ceilings.

PART 3 - EXECUTION - NOT USED

END OF SECTION 23 05 01

SECTION 23 05 03 - PIPES AND TUBES 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: Pipe and pipe fittings for the following systems:
   1. Chilled water piping.
   2. Equipment drains and over flows.
   3. Low pressure steam piping.
   4. Low pressure steam condensate piping.
   5. Unions and flanges.

B. Related Sections:
   1. Section 08 31 00 - Access Doors: Product requirements for access doors for placement by this section.
   2. Section 09 90 00 - Painting and Coating: Product and execution requirements for painting specified by this section.
   3. Section 23 05 23 - General-Duty Valves for HVAC Piping: Product requirements for valves for placement by this section.
   4. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment: Product requirements for pipe hangers and supports and firestopping for placement by this section.
   5. Section 23 05 48 - Noise and Vibration Controls for HVAC Piping and Equipment: Product requirements for Noise and Vibration Isolation for placement by this section.
   6. Section 23 07 00 - HVAC Insulation: Product requirements for piping insulation for placement by this section.

1.3 REFERENCES

A. American Society of Mechanical Engineers:
   1. ASME B16.3 - Malleable Iron Threaded Fittings.
   2. ASME B16.4 - Gray Iron Threaded Fittings.
   3. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
   4. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
   5. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
   6. ASME B31.1 - Power Piping.
   7. ASME B31.9 - Building Services Piping.
   8. ASME B36.10M - Welded and Seamless Wrought Steel Pipe.
   9. Con Edison Steam Service Rules.

B. ASTM International:
1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
3. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
4. ASTM A536 - Standard Specification for Ductile Iron Castings.
5. ASTM B32 - Standard Specification for Solder Metal.
6. ASTM B68 - Standard Specification for Seamless Copper Tube, Bright Annealed.
7. ASTM B75 - Standard Specification for Seamless Copper Tube.
8. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
9. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
10. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.

C. American Welding Society:
1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.
2. AWS D1.1 - Structural Welding Code - Steel.

D. American Water Works Association:
1. AWWA C110 - American National Standard for Ductile-Iron and Grey-Iron Fittings, 3 in. through 48 in. (75 mm through 1200 mm), for Water and Other Liquids.
2. AWWA C111 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
3. AWWA C151 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate layout of piping systems, including equipment, critical dimensions, and sizes for approval, prior to fabrication or installation.

C. Product Data: Submit data on pipe materials and fittings. Submit manufacturers catalog information.

D. Welder certifications and welding procedures.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.

C. Perform Work in accordance with NYCBC requirements.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing work of this section with minimum three (3) years documented experience.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.8 DELIVERY, STORAGE AND HANDLING

A. Furnish temporary end caps and closures on piping and fittings. Maintain in place until installation.

B. Protect piping from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not install underground piping when bedding is wet or frozen.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.11 COORDINATION

A. Refer to Section 23 05 00 for additional requirements.

PART 2 - PRODUCTS

2.1 EQUIPMENT DRAINS AND OVERFLOWS

A. Steel Pipe: ASTM A53/A53M Schedule 40, galvanized.
   1. Fittings: ASME B16.3, malleable iron or ASME B16.4, cast iron.
   2. Joints: Threaded for pipe 2 inches and smaller; flanged for pipe 2-1/2 inches and larger.

B. Copper Tubing: ASTM B88, Type L, hard drawn.
   1. Fittings: ASME B16.18, cast brass, or ASME B16.22 solder wrought copper.
   2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver.

2.2 UNIONS AND FLANGES

A. Unions for Pipe 2 inches and Smaller:
   1. Ferrous Piping: Class 250, malleable iron, threaded.
   2. Copper Piping: Class 150, bronze unions with brazed joints.

3. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

B. Flanges for Pipe 2-1/2 inches and Larger:
1. Ferrous Piping: Class 150, forged steel, slip-on flanges.
2. Copper Piping: Class 150, slip-on bronze flanges.
3. Gaskets: 1/16 inch thick preformed neoprene gaskets.

C. Flanges must be of same weight as the fittings and valves in each service category. Welding neck flanges must be used with flanged valves, equipment, etc., on welded lines. Galvanized screwed flanges must be used on galvanized screwed lines. Flanges must be drilled in conformance with 150 lbs. or 300 lbs. standard and must be faced and spot-faced. Screwed and loose flanges on brass piping must be brass. Laps must be machined on front, back and edge. Screwed flanges must have faces perpendicular to adjoining pipe.

2.3 PIPE FITTINGS

A. Each pipe fitting must have cast, stamped, or indelibly marked on it the marker's name or mark, weight, and quality of the product when such marking is required by the approved standard.

B. Welding fittings must be of same material and schedule as pipe to which they are welded. Welding fittings including laterals must be approved factory reinforced to develop full working pressure of connecting piping main. Welding elbows must be long radius pattern. Welding fittings must be used exclusively, except as otherwise specified. Weldolets may be used for branches only where branch is two (2) or more nominal pipe sizes smaller than main or riser. All welding "lateral" fittings must have pressure ratings equal to the pipe with which they are to be used. Welding fittings must be of Tube-Turn, Walworth, Weldbend or approved equal, to conform to ASTM-A-234 specifications.

C. Nipples must be extra heavy shoulder type of same material as pipe, close nipples are not acceptable.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment with flanges or unions.

D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.3 CONNECTIONS

A. Copper with solder or brazing joints must be cleaned bright and properly fluxed. Flux must be non-corrosive as approved.

B. Threaded Joints:
1. Make up screw pipe with clean sharp threads and pipe joint cement used on male thread only.
2. Ream ends of pipe and clean out the pipe after cutting.
3. Use graphite paste on threads of cleanout plugs.
4. Provide sufficient number of flanges or unions to disassemble piping without breaking screwed fittings.

C. Teflon paste must be used on screwed joints and applied to the male thread only.

D. In connection to equipment, the manufacturer's recommendation as to pipe size and arrangement must be followed. Connection to equipment must be made to permit ready disconnection of equipment with minimum disturbance to adjoining pipe. Screwed or flanged unions must be used at all equipment at inlet and outlet ends. Piping must be flanged, or fitted with unions for all sections immediately adjacent to connection of equipment which may require pipe removal to aid in all large tube pulling, coil removal, cleaning etc.

E. Assembly of the mechanical joint pipe and fittings must be complete with a torque wrench. Torque to be applied to each bolt must be between 60 pounds and 90 pounds. If effective sealing is not attained at the maximum torque indicated above, the joint must be disassembled and reassembled after thorough cleaning. Overstressing of bolts to compensate for poor installation will not be permitted.

F. Flange joints must be faced true, packed and made up perfectly square and tight. Each flange joint must be provided with suitable grade steel bolts for the specific service and with hexagon nuts. Bolts and nuts must be dipped in a mixture of graphite and oil, just before installation.

G. Gaskets must have proper thickness and suitable for specific service. All gaskets must be asbestos free. Gaskets in steam service must meet the requirement of the utility company.

H. Where piping is to be installed under related work by other Sections, in connection with work and equipment installed by this Trade, the piping will be installed by other Sections, this Trade will make the final connections.

I. Provide di-electric fittings for all connections between ferrous and non-ferrous metals.

3.4 INSTALLATION - ABOVE GROUND PIPING

A. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.

B. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.

C. Group piping whenever practical at common elevations.

D. Sleeve pipe passing through partitions, walls and floors. Refer to Section 23 05 29.

E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

F. Provide clearance in hangers and from structure and other equipment for Installation of insulation and access to valves and fittings. Refer to Section 23 07 00.

G. Provide access door where valves and fittings are concealed in inaccessible spaces. Coordinate size and location of access doors with Section 08 31 00.

H. Install non-conducting dielectric connections wherever jointing dissimilar metals. Insulate pipe joints or valves between dissimilar metals, to prevent dielectric action; use isolating flanges. Dielectric couplings are unacceptable

I. Cap pipe and equipment outlets during construction; keep lines and inside of equipment free of foreign materials.
   1. Provide for expansion without warping lines, or dislocating or straining connected equipment beyond allowable stress limits.
   2. Install piping to clear building construction and to avoid interference with work of other trades.
   3. Conceal piping.

J. Pipe base drains from pumps to open drains; use plugged tees at 90 degree turns.

K. Provide drain with gate valve for equipment containing water. Pipe to an open drain where such drain is within 50 feet of equipment.

L. Water Lines:
   1. At each low point, provide drain nipple and a 3/4" hose bibb drain or a 3/4" drain valve piped to an open drain.

M. Place valves and specialties so as to permit easy operation and access; pack all valves at the completion of the work before final inspection.

N. Water coils: Provide air venting at top of coil and drainage at bottom of coil with 1/2" gate valves.

O. Vents for water systems must be appropriately valved, 3/4” minimum, and piped over to indirect drains or to locations accessible for draining.

P. Provide a capped hose bibb and valve at the base of all water risers to accept a hose for drainage.

Q. Miscellaneous drains and overflow from tanks, equipment, piping, relief valves, pumps, etc., must be run to the nearest indirect drain and terminate in an elbow over the drain. Provide drain valves wherever required for complete drainage of piping, including the system side of all pump check valves. Drain lines must pitch not less than 1" in 40' in direction of flow.
   1. Screwed couplings and shoulder nipples not exceeding 6" in length must be of same material as pipe but of dimensions conforming to Schedule 80. Close nipples are prohibited.

R. Vertical sections of main risers in shafts must be constructed of pipe lengths welded together; do not use mechanical couplings or screwed fittings.

S. Drawings indicate generally the sizes and locations of pipe lines, but the Commissioner reserves the right to direct changes in run and details of pipe work as necessitated by site conditions. Piping to be of sizes indicated on the Drawings; size any pipe diameter not shown on the Drawings to be in proportion to the load carried at the same resistance as similar piping, or of sizes as directed by the Commissioner.

T. Cut piping accurately to measurements established at the Construction Site and work into place without springing or forcing, properly clearing all openings, structural members and other equipment. Overhead piping to run as high as possible under structural members.

U. Establish invert elevations, slopes for drainage to 1/4 inch minimum. Maintain gradients.

V. Slope piping and arrange systems to drain at low points.

W. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

X. Install piping penetrating roofed areas to maintain integrity of roof assembly.

Y. Install valves in accordance with Section 23 05 23.

Z. Insulate piping. Refer to Section 23 07 00.

AA. Install pipe identification in accordance with Section 23 05 53.

3.5 ROUTES AND GRADES

A. Piping shown on the drawings must be considered as diagrammatic for clearness and may or may not, in all parts, be shown in its true position. This fact does not, in any way, relieve the Contractor from full responsibility for the proper erection of a system of piping in every aspect suitable for the work intended.

B. Drawings indicate generally sizes and locations of pipelines, but the right is reserved to direct changes in details of pipe work as necessitated by actual conditions. Piping must be of sizes indicated on drawings. Any pipe size not shown must be in proportion to the load carried at the same resistance as similar piping, or of size as directed.

C. Piping must be accurately cut to measurement established at the construction site and must be worked into place without springing or forcing, properly clearing openings, structural members and other equipment. Overhead piping must be run as high as possible under structural members.

D. Exposed piping must run perpendicular and/or parallel to floors, walls, etc. Piping and valves must be grouped neatly and run so as to avoid reducing headroom or passage clearance.

E. Piping must be concealed. Piping must be installed so that same can be drained of all water.

F. Water mains must pitch upward in direction of flow.

G. Fittings of the eccentric reducing type must be used where change of size occurs in horizontal piping for proper drainage or venting.

H. Steel pipe bends must be made of open hearth, low carbon steel, leaving a smooth uniform exterior and interior finish. Pipe bends must be made with seamless steel pipe, having a minimum radius of not less than 5 pipe diameters.

I. Long-turn fittings must be used wherever conditions permit.

J. Piping above grade must be installed so as to be readily accessible for operation, maintenance, repair or replacement.

K. Extra heavy nipples for short shoulder type only. Close nipples are prohibited.

L. Under all conditions, and unless otherwise shown or directed, branches from any steam main must be taken from the top of the pipe, and all valve stems must stand upright or at an angle above the center line of the pipe and not handle down.

M. No piping or work of any kind will be concealed or covered until all required tests have been satisfactorily completed and the work has been approved by the Commissioner.

3.6 FIELD QUALITY CONTROL

A. Test heating water piping system, glycol piping system, chilled water piping system and condenser water piping system in accordance with ASME B31.9.

B. Test low pressure steam supply piping, low pressure steam condensate piping, medium and high pressure steam supply piping and medium and high pressure steam condensate piping in accordance with ASME B31.9.

3.7 PRESSURE TESTING OF PIPING SYSTEMS

A. Pay fees for tests and inspections; furnish labor, materials, equipment and any instruments required for the tests.

B. Perform tests and comply with requirements of the inspecting agency to obtain approval for the City of New York’s use of systems and equipment, as a part of the Work.

C. Replace or repair equipment damaged during testing.

D. Give advance notice of tests to the Commissioner.

E. Replace any materials which fail under testing and replace or satisfactorily repair any other materials or work damaged by the testing or failures.

F. Do not conceal or insulate any section of piping until testing on that section has been satisfactorily completed and approved.

G. The Contractor must provide all temporary valves, blanks and accessories for all piping tests, as part of the Work.

H. Test Criteria: Make all piping systems tight under the following test conditions:
   1. Perform hydrostatic test as specified in "Examination, Inspection and Testing" of ANSI B31.9 code, except that duration of test will be two hours without pressure drop and that no system will be tested at less than indicated in Item 3 below.
   2. If outside temperature is expected to be at or below freezing temperature, the Commissioner has the option to require that the Contractor test piping by the use of non-corrosive glycol/water mixture.
   3. Unless otherwise noted or specified, screwed piping will be tested under a hydrostatic pressure of 200 psig for a period of 2 hours without fall in pressure gauge reading. Welded and brazed piping will be subjected to 150 psig air pressure test and welds inspected by applying soap suds. During the air pressure tests, pinholes must be rewelded at the direction of the Commissioner. Following the air pressure test, piping will be subjected to hydrostatic test for a period of 2 hours without fall in the pressure gauge reading.

I. Hydrostatic test at 1-1/2 times operating pressure. Operating pressure of water systems, unless noted otherwise, will be determined by adding pump shutoff head to building static height, with consistent units.

J. Miscellaneous Drain Piping:
   1. Perform same tests as specified for water piping above, except that minimum test pressure will be 50 psig and test duration will be a minimum of 10 minutes (unless directed by the Commissioner to be of longer duration).

K. Heat exchangers, valves, strainers and piping accessories must be treated as part of the piping system for testing purposes, except for the following items:
   1. Pressure gauges or other sensitive instruments which might be damaged during testing - remove during test and replace after test.

L. Underground Piping Tests: same as piping above ground.

3.8 SYSTEM REQUIREMENTS

A. All piping systems and components must be rated for a minimum design working pressure of 150 psig, unless otherwise noted.

END OF SECTION 23 05 03

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SECTION 23 05 13 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes single- and three-phase motors for application on equipment provided under other sections and for motors furnished loose to Project.

B. Related Sections:
1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
2. Section 26 05 53 - Identification for Electrical Systems.

1.3 REFERENCES

A. American Bearing Manufacturers Association:
1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.

B. National Electrical Manufacturers Association:
1. NEMA MG 1 - Motors and Generators.

C. International Electrical Testing Association:
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

D. New York City Electrical Code.

E. Underwriter’s Laboratory.

F. New York State Energy Research and Development Authority (NYSERDA).

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit catalog data for each motor furnished. Indicate nameplate data, standard compliance, electrical ratings and characteristics, and physical dimensions, weights, mechanical performance data, and support points.

C. Test Reports: Indicate procedures and results for specified factory and field testing and inspection.

D. The motor nameplate and connection diagram must be stainless steel and contain the following information:

1. Manufacturers' name
2. Rated volts and full load current
3. Rated frequency and number of phases
4. Rated full load speed
5. Rated temperature rise and rated ambient temperature
6. Time rating
7. Rated horsepower
8. Locked rotor code letter
9. Motors starting on wye connection and running on delta, must be marked with the code letter corresponding to the wye connection.
10. Dual voltage motors which have a different locked rotor KVA on the two voltages, must be marked with the code letter for the voltage giving the highest locked rotor KVA.
11. NEMA design letter
12. Service factor
13. Efficiency

E. In general, motors must be furnished integrally mounted on all items of mechanical equipment.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

C. All motors must be UL approved and listed.

1.6 DELIVERY, STORAGE AND HANDLING

A. Lift only with lugs provided. Handle carefully to avoid damage to components, enclosure, and finish.

B. Protect products from weather and moisture by covering with plastic or canvas and by maintaining heating within enclosure.

C. For extended outdoor storage, remove motors from equipment and store separately.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR MOTORS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Cooper Industries Inc.
2. Baldor Electric Co.
3. General Electric Co.
4. Emerson Electrical
5. Or approved equal.

B. Motors 1/2 hp and Larger: Three-phase motor as specified below.

C. Motors Smaller Than 1/2 hp: Single-phase motor as specified below, except motors less than 250 watts or 1/4 hp may be equipment manufacturer's standard.

D. Three-Phase Motors: NEMA MG 1, Design B, premium-efficient squirrel-cage induction motor, with windings to accomplish starting methods and number of speeds as indicated on Drawings.
   1. Voltage: 200 Volts, three phase, 60 Hz or as indicated on Drawings.
   2. Service Factor: 1.15 unless indicated otherwise on Drawings.
   3. Enclosure: Meet conditions of installation unless specific enclosure is indicated on Drawings or specified. Enclosure for pump motors or motors exposed to weather must be totally enclosed fan-cooled type.
   4. Design for continuous operation in 40 degrees C environment, with temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
   5. Insulation System: NEMA Class F.
   6. Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron with end brackets of cast iron or aluminum with steel inserts.
   7. Thermistor System (Motor Frame Sizes 254T and Larger): Three PTC thermistors embedded in motor windings and epoxy encapsulated solid state control relay with wiring to terminal box.
   8. Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication, rated for minimum ABMA 9, L-10 life of 200,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt center line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.
   9. Sound Power Levels: Conform to NEMA MG 1.
   10. Efficiency: Premium efficiency motors conforming to NEMA.
   11. Inverter Duty Rated for motors controlled by VFD. Fan motors controlled by VFD must be equipped with shaft grounding rings.
   12. Motor weight exceeding 25 pounds must have lifting eyes.

E. Single Phase Motors:
   1. Permanent split-capacitor type where available, otherwise use split-phase start/capacitor run or capacitor start/capacitor run motor.
   2. Voltage: 115 volts, single phase, 60 Hz.

F. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated.

2.2 SOURCE QUALITY CONTROL

A. Test motors in accordance with NEMA MG 1, including winding resistance, no-load speed and current, locked rotor current, insulation high-potential test, and mechanical alignment tests.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXISTING WORK

A. Disconnect and remove abandoned motors

B. Maintain access to existing motors and other installations remaining active and requiring access. Modify installation or provide access panel.

C. Clean and repair existing motors to remain or are to be reinstalled.

3.3 INSTALLATION

A. Install motor in alignment with shaft of the drive. Alignment test must be done prior to operating the equipment.

B. Install engraved plastic nameplates in accordance with Section 26 05 53.

C. Ground and bond motors in accordance with Section 26 05 26.

D. Coordinate two-speed motor installation with Division 26.

E. Provide motor shaft grounding ring (SGR) for motors controlled by Variable Frequency Drive.

3.4 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.15.

END OF SECTION 23 05 13

SECTION 23 05 14 - MOTOR CONTROLS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract 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. National Electrical Manufacturers Association:
   1. NEMA FU 1 - Low Voltage Cartridge Fuses.
   2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
   3. NEMA ICS 2.3 - Instructions for the Handling, Installation, Operation, and Maintenance of Motor Control Centers.
   4. NEMA ICS 3 - Industrial Control and Systems: Factory Built Assemblies.
   5. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
   6. NEMA ICS 7 - Industrial Control and Systems: Adjustable Speed Drives.
   7. NEMA ICS 7.1 - Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable Speed Drive Systems.
   8. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).

B. International Electrical Testing Association:
   1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. Underwriters Laboratories Inc.:
   1. UL 198E - Class R Fuses.
   2. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.
   3. UL 508 - Industrial Control Panels.
   4. UL 845 - Motor Control Centers.

D. Material and Installation must comply with latest editions of NYCBC.

E. Examine the Contract Documents of Division 26 for coordinating work specified under this section.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Submit shop drawings and product data in accordance with DDC General Conditions.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.5 WARRANTY

A. Furnish five-year manufacturer warranty for motor controls.

PART 2 - PRODUCTS

2.1 GENERAL

A. Furnish and install all motors, and furnish all variable speed drives, combination motor starters/disconnect switches, disconnect switches and starters that are required for controlling the HVAC equipment and motors.

B. Coordinate with Division 26 work for installation of and for proper integration of electrical power wiring with the motors, and equipment that are provided under Division 23.

2.2 MOTOR STARTERS AND CONTROLS

A. All motor controllers and starters integral must be in accordance with the following:
   1. All individually mounted motor controllers and starters must be of the following type:
      a. Combination fused switch and magnetic controller with solid-state overload protection and low voltage protection.
      b. Manual toggle switch operation 2 pole or single pole starter with overload protection in approved NEMA enclosure. Where motors are installed remote from starters, provide pilot light.
   2. Provide UL Class RK-1 time-delay, current limiting fuses for all combination starters. Fuses must be selected based on the fuse manufacturer’s motor sizing tables and must be coordinated with the upstream fuse or circuit breaker.
   3. Starters must be NEMA rated contactors with solid-state electronic motor overload protection.
   4. All starters must be provided with thermal overload protection in all phase legs. Starters for 3-phase motors must be equipped solid-state electronic overload units, which must also provide single phase protection. Single phase manual starters must be equipped with melting alloy overload relays.
   5. Provide all starters with an external overload reset button, mounted in the starter cover.
   6. Provide three-position, maintained contact rotary selector switch (H-O-A) in starter covers for all automatically controlled motors. Pushbuttons are not required where H-O-A switches are used.
   7. Provide 120V control power transformers in all controllers. Control power transformers must be provided with two primary and one secondary fuse. Fuses must be UL Class CC time delay type.
   8. Provide all necessary auxiliary contacts in starters as required. Provide time delay relays for all interlocked motors.
   9. All pilot lights must be LED type with red or green jewel as indicated. Provide pilot lights where required as follows:
      a. Starters with start-stop pushbutton: 1 pilot light to indicate "Motor On".
      b. Starters with H-O-A switches: 1 pilot light to indicate "Motor On".

10. Each controller, mounted in NEMA type enclosure. Enclosures will be as follows:
    a. Exterior: NEMA 4X stainless steel.
    b. Interior, dry locations: NEMA 1.
    c. Boiler rooms: NEMA 12.
11. Enclosure sizes and wiring terminals must be suitable for the use of copper power and control conductors.
12. Starters will be subject to the approval, as to limit of inrush current, as set up by the Utility Company. In general, magnetic starters must be located close to the equipment controlled.

2.3 REMOTE DEVICES

A. Remote "Hand-off-auto" selector switch, pilot light, and similar devices, must be of same manufacture as the associated starter, and must be oiltight.

B. Remote pilot light must be LED type.

C. Remote contact making devices must be pilot duty rated.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

A. Motors installed, not in strict compliance with the above, must be replaced at no cost to the City of New York.

3.3 ELECTRICAL WIRING

A. Provide all necessary wiring diagrams indicating wire size and connections as required for the proper operation of the equipment.

B. Contractor must be responsible for replacing all fuses in the electrical systems during construction which blow due to tests or malfunction of the motorized or non-motorized electrical equipment.

3.4 INSTALLATION

A. Assembly:
    1. Assemble shipping sections and set motor control centers in place level, plumb and in alignment; with channel sills level over their full length on surface of housekeeping pads.
    2. Make required mechanical and electrical connections including those indicated on approved shop drawings.
    3. Touch-up paint all marred factory finishes.

B. Overload Elements:
    1. Provide in accordance with motor nameplate current, service factor and ambient temperature.

2. With clamp-on ammeter verify loading of motors. Adjust solid-starter overload setting per the manufacturer's instructions.

C. Tighten and torque electrical connections in accordance with manufacturer's instruction and UL 486.

3.5 TESTING

A. Coordinate testing of starter with testing of the motor and the system associated with the motor.

END OF SECTION 23 05 14

SECTION 23 05 15 - VARIABLE FREQUENCY DRIVES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 covers a complete Variable Frequency Motor Drive (VFD) consisting of a pulse width modulated (PWM) inverter designed for use with a standard NEMA Design B induction motor.
   2. The drive manufacturer must supply the drive and all necessary options as herein specified. The manufacturer must have been engaged in the production of this type of equipment for a minimum of three (3) years. VFD's that are manufactured by a third party and "brand labeled" will not be acceptable. All VFDs installed on this project must be from the same manufacture.

1.3 REFERENCED STANDARDS

A. Institute of Electrical and Electronic Engineers (IEEE):
   1. Standard 519-1992, IEEE Guide for Harmonic Content and Control.

B. Underwriters Laboratories:
   1. UL508C.

C. National Electrical Manufacturer's Association (NEMA):
   1. ICS 7.0, AC Adjustable Speed Drives.

D. IEC 16800 Parts 1 and 2.

E. National Electric Code (NEC):
   1. NEC 430.120, Adjustable-Speed Drive Systems.

F. International Building Code (IBC):
   1. IBC 2006 Seismic – referencing ASC 7-05 and ICC AC-156.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

B. Submittals must include the following information:
   1. Outline dimensions, conduit entry locations and weight.
   2. Customer connection and power wiring diagrams.

3. Complete technical product description include a complete list of options provided. Any portions of this specification not met must be clearly indicated or the supplier and Contractor will be liable to provide all additional components required to meet this specification.
4. Compliance to IEEE 519 – harmonic analysis for particular jobsite including total harmonic voltage distortion and total harmonic current distortion (TDD).
    a. The VFD manufacturer must provide calculations; specific to this installation, showing total harmonic voltage distortion is less than 5%. Input filters must be sized and provided as required by the VFD manufacturer to ensure compliance with IEEE standard 519. All VFD's must include a minimum of 5% impedance reactors, no exceptions.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. The VFD package as specified herein must be enclosed in a UL Listed Type enclosure, exceeding NEMA enclosure design criteria (enclosures with only NEMA ratings are not acceptable), completely assembled and tested by the manufacturer in an ISO9001 facility. The VFD tolerated voltage window must allow the VFD to operate from a line of +30% nominal, and -35% nominal voltage as a minimum.
    1. Environmental Operating Conditions: VFDs must be capable of continuous operation at 32 to 122°F ambient temperature as per VFD manufacturers documented/submittal data or VFD must be oversized to meet these temperature requirements. Not acceptable are VFD's that can only operate at 40°C intermittently (average during a 24-hour period) and therefore must be oversized. Altitude 0 to 3,300 feet above sea level, less than 95% humidity, non-condensing. All circuit boards must have conformal coating.
    2. Enclosure must be rated UL Type 1 and be UL listed as a plenum rated VFD. VFD's without these ratings are not acceptable. NEMA only type 1 enclosures are not acceptable (must be UL Type°1).

C. All VFDs must have the following standard features:
    1. All VFDs must have the same customer interface, including digital display, and keypad, regardless of horsepower rating. The keypad must be removable, capable of remote mounting and allow for uploading and downloading of parameter settings as an aid for start-up of multiple VFDs.
    2. The VFD must have code-required disconnecting means.
    3. The keypad must include Hand-Off-Auto selections and manual speed control. The drive must incorporate "bumpless transfer" of speed reference when switching between "Hand" and "Auto" modes. There must be fault reset and "Help" buttons on the keypad. The Help button must include "on-line" assistance for programming and troubleshooting.
    4. There must be a built-in time clock in the VFD keypad. The clock must have a battery back up with 10 years minimum life span. The clock must be used to date and time stamp faults and record operating parameters at the time of fault. If the battery fails, the VFD must automatically revert to hours of operation since initial power up. Capacitor back-up is not acceptable. The clock must also be programmable to control start/stop functions, constant speeds, PID parameter sets and output Form-C relays. The VFD must have a digital input that allows an override to the time clock (when in the off mode) for a programmable time frame. There must be four (4) separate, independent timer functions that have both weekday and weekend settings.
    5. The VFD's must utilize pre-programmed application macro's specifically designed to facilitate start-up. The Application Macros must provide one command to reprogram all parameters and customer interfaces for a particular application to reduce programming time. The VFD must have two user macros to allow the end-user to create and save custom settings.

6. The VFD must have cooling fans that are designed for easy replacement. The fans must be designed for replacement without requiring removing the VFD from the wall or removal of circuit boards. The VFD cooling fans must operate only when required. To extend the fan and bearing operating life, the VFD must cycle the cooling fans on and off as required.
7. The VFD must be capable of starting into a coasting load (forward or reverse) up to full speed and accelerate or decelerate to set point without tripping or component damage (flying start).
8. The VFD must have the ability to automatically restart after an over-current, over-voltage, under-voltage, or loss of input signal protective trip. The number of restart attempts, trial time, and time between attempts must be programmable.
9. The overload rating of the drive must be 110% of its normal duty current rating for 1 minute every 10 minutes, 130% overload for 2 seconds. The minimum FLA rating must meet or exceed the values in the NEC/UL table 430.250 for 4-pole motors.
10. The VFD must have internal 5% impedance reactors to reduce the harmonics to the power line and to add protection from AC line transients. The 5% impedance may be from dual (positive and negative DC bus) reactors, or 5% AC line reactors. VFD's with only one DC reactor must add an AC line reactor.
11. The input current rating of the VFD must be no more than 3% greater than the output current rating. VFD's with higher input current ratings require the upstream wiring, protection devices, and source transformers to be oversized per NEC 430.120. Input and output current ratings must be shown on the VFD nameplate.
12. The VFD must include a coordinated AC transient surge protection system consisting of 4-120 joule rated MOV's (phase to phase and phase to ground), a capacitor clamp, and 5% impedance reactors.
13. The VFD must provide a programmable loss-of-load (broken belt / broken coupling) Form-C relay output. The drive must be programmable to signal the loss-of-load condition via a keypad warning, Form-C relay output, and/or over the serial communications bus. The loss-of-load condition sensing algorithm must include a programmable time delay that will allow for motor acceleration from zero speed without signaling a false loss-of-load condition.
14. The VFD must have user programmable underload and overload curve functions to allow user defined indications of broken belt or mechanical failure / jam condition causing motor overload
15. The VFD must include multiple "two zone" PID algorithms that allow the VFD to maintain PID control from two separate feedback signals (4-20mA, 0-10V, and / or serial communications). The two-zone control PID algorithm will control motor speed based on a minimum, maximum, or average of the two feedback signals. All of the VFD PID controllers must include the ability for "two zone" control.
16. If the input reference (4-20mA or 2-10V) is lost, the VFD must give the user the option of either (1) stopping and displaying a fault, (2) running at a programmable preset speed, (3) hold the VFD speed based on the last good reference received, or (4) cause a warning to be issued, as selected by the user. The drive must be programmable to signal this condition via a keypad warning, Form-C relay output and / or over the serial communication bus.
17. The VFD must have programmable "Sleep" and "Wake up" functions to allow the drive to be started and stopped from the level of a process feedback signal.

D. All VFDs to have the following adjustments:
1. Three (3) programmable critical frequency lockout ranges to prevent the VFD from operating the load continuously at an unstable speed. The lockout range must be fully adjustable, from 0 to full speed.
2. Two (2) PID Set point controllers must be standard in the drive, allowing pressure or flow signals to be connected to the VFD, using the microprocessor in the VFD for the closed-loop control. The VFD must have 250 ma of 24 VDC auxiliary power and be capable of loop powering a transmitter supplied

by others. The PID set point must be adjustable from the VFD keypad, analog inputs, or over the communications bus. There must be two independent parameter sets for the PID controller and the capability to switch between the parameter sets via a digital input, serial communications or from the keypad. The independent parameter sets are typically used for night setback, switching between summer and winter set points, etc.

3. There must be an independent, second PID loop that can utilize the second analog input and modulate one of the analog outputs to maintain the set point of an independent process (i.e., valves, dampers, etc.). All set points, process variables, etc. to be accessible from the serial communication network.
4. Two (2) programmable analog inputs must accept current or voltage signals.
5. Two (2) programmable analog outputs (0-20ma or 4-20 ma). The outputs may be programmed to output proportional to Frequency, Motor Speed, Output Voltage, Output Current, Motor Torque, Motor Power (kW), DC Bus voltage, Active Reference, Active Feedback and other data.
6. Six (6) programmable digital inputs for maximum flexibility in interfacing with external devices. All digital inputs must be programmable to initiate upon an application or removal of 24VDC or 24VAC.
7. Three (3) programmable, digital Form-C relay outputs. The relay outputs must include programmable on and off delay times and adjustable hysteresis. The relays must be rated for maximum switching current 8 amps at 24 VDC and 0.4 A at 250 VAC; Maximum voltage 300 VDC and 250 VAC; continuous current rating of 2 amps RMS. Outputs must be true Form-C type contacts; open collector outputs are not acceptable.
8. Run permissive circuit - There must be a run permissive circuit for damper or valve control. Regardless of the source of a run command (keypad, input contact closure, time-clock control, or serial communications), the VFD must provide a dry contact closure that will signal the damper to open (VFD motor does not operate). When the damper is fully open, a normally open dry contact (end-switch) will close. The closed end-switch is wired to a VFD digital input and allows VFD motor operation. Two separate safety interlock inputs must be provided. When either safety is opened, the motor will be commanded to coast to stop and the damper will be commanded to close. The keypad will display “start enable 1 (or 2) missing”. The safety input status will also be transmitted over the serial communications bus.
9. The VFD control must include a programmable time delay for VFD start and a keypad indication that this time delay is active. A Form C relay output provides a contact closure to signal the VAV boxes open. This will allow VAV boxes to be driven open before the motor operates. The time delay must be field programmable from 0 – 120 seconds. Start delay must be active regardless of the start command source (keypad command, input contact closure, time-clock control, or serial communications), and when switching from drive to bypass.
10. Seven (7) programmable preset speeds.
11. Two independently adjustable accel and decel ramps with 1 – 1800 seconds adjustable time ramps.
12. The VFD must include a motor flux optimization circuit that will automatically reduce applied motor voltage to the motor to optimize energy consumption and reduce audible motor noise. The VFD must have selectable software for optimization of motor noise, energy consumption, and motor speed control.
13. The VFD must include a carrier frequency control circuit that reduces the carrier frequency based on actual VFD temperature that allows higher carrier frequency settings without derating the VFD.
14. The VFD must include password protection against parameter changes.

E. The Keypad must include a backlit LCD display. The display must be in complete English words for programming and fault diagnostics (alpha-numeric codes are not acceptable). All VFD faults must be displayed in English words. The keypad must include a minimum of 14 assistants including:
   1. Start-up assistant

2. Parameter assistants:
   a. PID assistant
   b. Reference assistant
   c. I/O assistant
   d. Serial communications assistant
   e. Option module assistant
   f. Panel display assistant
   g. Low noise set-up assistant
3. Maintenance assistant
4. Troubleshooting assistant
5. Drive optimizer assistants

F. All applicable operating values must be capable of being displayed in engineering (user) units. A minimum of three operating values from the list below must be capable of being displayed at all times. The display must be in complete English words (alpha-numeric codes are not acceptable):
1. Output Frequency:
2. Motor Speed (RPM, %, or Engineering units)
3. Motor Current
4. Motor Torque
5. Motor Power (kW)
6. DC Bus Voltage
7. Output Voltage

G. The VFD must include a fireman's override input. Upon receipt of a contact closure from the fire / smoke control station, the VFD must operate in one of two modes: 1) Operate at a programmed predetermined fixed speed ranging from -500Hz (reverse) to 500Hz (forward). 2) Operate in a specific fireman's override PID algorithm that automatically adjusts motor speed based on override set point and feedback. The mode must override all other inputs (analog/digital, serial communication, and all keypad commands), except customer defined safety run interlocks, and force the motor to run in one of the two modes above. "Override Mode" must be displayed on the keypad. Upon removal of the override signal, the VFD must resume normal operation, without the need to cycle the normal digital input run command.

H. Serial Communications:
1. The VFD must have an EIA-485 port as standard. The protocols must be Modbus, Johnson Controls N2, Siemens Building Technologies FLN, BACnet, LonWorks, Profibus, EtherNet, BACnet IP, and DeviceNet. Each individual drive must have the protocol in the base VFD. The use of third-party gateways and multiplexers is not acceptable. All protocols must be "certified" by the governing authority (i.e., BTL Listing for BACnet). Use of non-certified protocols is not allowed.
2. The BACnet connection must be an EIA-485, MS/TP interface operating at 9.6, 19.2, 38.4, or 76.8 Kbps. The connection must be tested by the BACnet Testing Labs (BTL) and be BTL Listed. The BACnet interface must conform to the BACnet standard device type of an Applications Specific Controller (B-ASC). The interface must support all BIBBs defined by the BACnet standard profile for a B-ASC including, but not limited to:
   a. Data Sharing – Read Property – B.
   b. Data Sharing – Write Property – B.
   c. Device Management – Dynamic Device Binding (Who-Is; I-Am).
   d. Device Management – Dynamic Object Binding (Who-Has; I-Have).
   e. Device Management – Communication Control – B.

3. If additional hardware is required to obtain the BACnet interface, the VFD manufacturer must supply one BACnet gateway per drive. Multiple VFDs sharing one gateway will not be acceptable.
4. Serial communication capabilities must include, but not be limited to; run-stop control, speed set adjustment, proportional/ integral/ derivative PID control adjustments, current limit, accel/decel time adjustments, and lock and unlock the keypad. The drive must have the capability of allowing the Direct Digital Controls to monitor feedback such as process variable feedback, output speed / frequency, current (in amps), % torque, power (kW), kilowatt hours (resettable), operating hours (resettable), and drive temperature. The Direct Digital Controls must also be capable of monitoring the VFD relay output status, digital input status, and all analog input and analog output values. All diagnostic warning and fault information must be transmitted over the serial communications bus. Remote VFD fault reset must be possible.
5. Serial communication in bypass must include, but not be limited to; bypass run-stop control, the ability to force the unit to bypass, and the ability to lock and unlock the keypad. The bypass must have the capability of allowing the Direct Digital Controls to monitor feedback such as, current (in amps), kilowatt hours (resettable), operating hours (resettable), and bypass logic board temperature. The Direct Digital Controls must also be capable of monitoring the bypass relay output status, and all digital input status. All bypass diagnostic warning and fault information must be transmitted over the serial communications bus. Remote bypass fault reset must be possible.
6. The VFD / bypass must allow the Direct Digital Controls to control the drive and bypass digital and analog outputs via the serial interface. This control must be independent of any VFD function. The analog outputs may be used for modulating chilled water valves or cooling tower bypass valves. The drive and bypass' digital (Form-C relay) outputs may be used to actuate a damper, open a valve or control any other device that requires a maintained contact for operation. In addition, all of the drive and bypass' digital inputs must be capable of being monitored by the Direct Digital Controls system. This allows for remote monitoring of which (of up to 4) safeties are open.
7. The VFD must include an independent PID loop for customer use. The independent PID loop may be used for cooling tower bypass value control, chilled water value / hot water valve control, etc. Both the VFD PID control loop and the independent PID control loop must continue functioning even if the serial communications connection is lost. As default, the VFD must keep the last good set point command and last good DO & AO commands in memory in the event the serial communications connection is lost and continue controlling the process.

I. EMI / RFI filters: All VFD's must include EMI/RFI filters. The onboard filters must allow the VFD assembly to be CE Marked and the VFD must meet product standard EN 61800-3 for the First Environment restricted level with up to 100 feet of motor cable. No Exceptions. Certified test reports must be provided with the submittals confirming compliance to EN 61800-3, First Environment.

J. All VFD's through 75HP at 480 V must be protected from input and output power mis-wiring. The VFD must sense this condition and display an alarm on the keypad. The VFD must not sustain damage from this power mis-wiring condition.

K. Features – Features to be furnished and mounted by the drive manufacturer. All features must be UL Listed by the drive manufacturer as a complete assembly and carry a UL508 label.
   1. A complete factory wired and tested bypass system consisting of an output contactor and bypass contactor per section 2.01K below.
   2. Fieldbus adapters - Protocols such as LonWorks, DeviceNet, Ethernet IP (ControlNet over Ethernet & ModBus TCP), BACnet IP, and Profibus must be provided. Coordinate with appropriate communications protocol with BMS vendor.

L. Bypass Controller:

1. A complete factory wired and tested bypass system consisting of a door interlocked, padlockable circuit breaker, output contactor, bypass contactor, and fast acting VFD input fuses are required. UL Listed motor overload protection must be provided in both drive and bypass modes.
2. The bypass enclosure door and VFD enclosure must be mechanically interlocked such that the disconnecting device must be in the "Off" position before either enclosure may be accessed. Provide bypass interlock for use by qualified personnel. Bypass contactor must be NEMA rated and must be equipped with solid-state electronic overloads.
3. The VFD and bypass package must have a UL listed short circuit current rating (SCCR) of 100,000 amps and this rating must be indicated on the UL data label.
4. The drive and bypass package must be seismic certified and labeled to the IBC:
   a. Seismic importance factor of 1.5 rating is required, and must be based upon actual shake table test data as defined by ICC AC-156.
5. Drive Isolation Fuses - To ensure maximum possible bypass operation, fast acting fuses, exclusive to the VFD, must be provided to allow the VFD to disconnect from the line prior to clearing upstream branch circuit protection. This maintains bypass operation capability in the event of a VFD failure. Bypass designs which have no such fuses, or that incorporate fuses common to both the VFD and the bypass, will not be accepted.
6. The system (VFD and Bypass) tolerated voltage window must allow the system to operate from a line of +30%, -35% nominal voltage range. The system must incorporate circuitry that will allow the drive or bypass contactor to remain "sealed in" over this voltage tolerance at a minimum.
7. The bypass must maintain positive contactor control through the voltage tolerance window of nominal voltage +30%, -35%. This feature is designed to avoid contactor coil failure during brown out / low line conditions and allow for input single phase operation when in the VFD mode. Designs that will not allow input single phase operation in the VFD mode are not acceptable.
8. Motor protection from single phase power conditions - the bypass system must be able to detect a single phase input power condition while running in bypass, disengage the motor in a controlled fashion, and give a single phase input power indication. Bypass systems not incorporating single phase protection in bypass mode are not acceptable.
9. The bypass system must not depend on the VFD for bypass operation. The bypass system must be designed for standalone operation and must be completely functional in both Hand and Automatic modes even if the VFD has been removed from the system for repair / replacement. Serial communications must remain functional even with the VFD removed.
10. Serial communications – the bypass must be capable of being monitored and / or controlled via serial communications. On-board communications protocols must include ModBus, Johnson Controls N2, Siemens Building Technologies FLN (P1), BACnet or approved equal.
11. Serial communication capabilities must include, but not be limited to; bypass run-stop control; the ability to force the unit to bypass; and the ability to lock and unlock the keypad. The bypass must have the capability of allowing the Direct Digital Controls to monitor feedback such as, current (in amps), kilowatt hours (resettable), operating hours (resettable), and bypass logic board temperature. The Direct Digital Controls must also be capable of monitoring the bypass relay output status, and all digital input status. All bypass diagnostic warning and fault information must be transmitted over the serial communications bus. Remote bypass fault reset must be possible. The following additional status indications and settings must be transmitted over the serial communications bus and / or via a Form-C relay output – keypad "Hand" or "Auto" selected, bypass selected, and broken belt indication. The Direct Digital Controls system must also be able to monitor if the motor is running in the VFD mode or bypass mode over serial communications. A minimum of 50 field serial communications points must be capable of being monitored in the bypass mode.

12. The bypass serial communications must allow control of the bypass' digital outputs via the serial interface. This control must be independent of any bypass function or operating state. The bypass' digital (relay) outputs may be used to actuate a damper, open a valve or control any other device that requires a maintained contact for operation. In addition, all of the bypass' digital inputs must be capable of being monitored by the Direct Digital Controls system.
13. There must be an adjustable motor current sensing circuit for the bypass and VFD modes to provide proof of flow (broken belt) indication. The condition must be indicated on the keypad display, transmitted over the building automation protocol and/or via a Form-C relay output contact closure. The broken belt indication must be programmable to be a system (drive and bypass) indication. The broken belt condition sensing algorithm must be programmable to cause only a warning or a fault and / or system shutdown.
14. The digital inputs for the system must accept 24VAC or 24VDC. The bypass must incorporate an internally sourced power supply and not require an external control power source. The bypass power board must supply 250 ma of 24 VDC for use by others to power external devices.
15. There must be a run permissive circuit for damper or valve control. Regardless of the source of a run command (keypad command, time-clock control, digital input, or serial communications) the bypass must provide a dry contact closure that will signal the damper to open (motor does not operate). When the damper is fully open, a normally open dry contact (end-switch) will close. The closed end-switch is wired to a bypass system input and allows motor operation. Up to four separate safety interlock inputs must be provided. When any safety is opened, the motor will be commanded to coast to stop, and the damper will be commanded to close. This feature will also operate in Fireman's override / smoke control mode.
16. The bypass control will monitor the status of the VFD and bypass contactors and indicate when there is a welded contactor contact or open contactor coil. This failed contactor condition will be indicated on the bypass LCD display, programmed to fire a Form-C relay output, and / or over the serial communications protocol.
17. The bypass control must include a programmable time delay for bypass start and keypad indication that this time delay is in process. A Form C relay output provides a contact closure to signal the VAV boxes open. This will allow VAV boxes to be driven open before the motor operates at full speed in the bypass mode. The time delay must be field programmable from 0 – 120 seconds.
18. There must be a keypad adjustment to select manual or automatic transfer bypass. The user must be able to select via keypad programming which drive faults will result in an automatic transfer to the bypass mode and which faults require a manual transfer to bypass. The user may select whether the system will automatically transfer from drive to bypass mode on the following drive fault conditions:
    a. Over current
    b. Over voltage
    c. Under voltage
    d. Loss of analog input
19. The following operators must be provided:
    a. Bypass Hand-Off-Auto
    b. Drive mode selector
    c. Bypass mode selector
    d. Bypass fault reset
20. The bypass must include a two-line, 20-character LCD display. The display must allow the user to access and view:
    a. Energy savings – in US dollars
    b. Bypass motor amps
    c. Bypass input voltage – average and individual phase voltage

d. Bypass power (kW)
e. Bypass faults and fault logs
f. Bypass warnings
g. Bypass operating time (resettable)
h. Bypass energy (kilowatt hours – resettable)
i. I/O status
j. Parameter settings / programming
k. Printed circuit board temperature

21. The following indicating lights (LED type) or keypad display indications must be provided. A test mode or push to test feature must be provided.
    a. Power-on (Ready)
    b. Run enable
    c. Drive mode selected
    d. Bypass mode selected
    e. Drive running
    f. Bypass running
    g. Drive fault
    h. Bypass fault
    i. Bypass H-O-A mode
    j. Automatic transfer to bypass selected
    k. Safety open
    l. Damper opening
    m. Damper end-switch made
22. The Bypass controller must have six programmable digital inputs, and five programmable Form-C relay outputs. This I/O allows for a total System (VFD and Bypass) I/O count of 24 points as standard. The bypass I/O must be available to the BAS / Direct Digital Controls system even with the VFD removed.
23. The on-board Form-C relay outputs in the bypass must be programmable for any of the following indications:
    a. System started
    b. System running
    c. Bypass override enabled
    d. Drive fault
    e. Bypass fault
    f. Bypass H-O-A position
    g. Motor proof-of-flow (broken belt)
    h. Overload
    i. Bypass selected
    j. Bypass run
    k. System started (damper opening)
    l. Bypass alarm
    m. Over temperature
24. The bypass must provide a separate terminal strip for connection of freeze, fire, smoke contacts, and external start command. All external safety interlocks must remain fully functional whether the system is in VFD or Bypass mode. The remote start/stop contact must operate in VFD and bypass modes. The terminal strip must allow for independent connection of up to four (4) unique safety inputs.

25. The bypass must include a supervisory control mode. In this bypass mode, the bypass must monitor the value of the VFD's analog input (feedback). This feedback value is used to control the bypass contactor on and off state. The supervisory mode must allow the user to maintain hysteresis control over applications such as cooling towers and booster pumps even with the VFD out of service.
26. The user must be able to select the text to be displayed on the keypad when an external safety opens. Example text display indications include "FireStat", "FreezStat", "Over pressure" and "Low suction". The user must also be able to determine which of the four (4) safety contacts is open over the serial communications connection.
27. Smoke Control Override Mode (Override 1) – The bypass must include a dedicated digital input that will transfer the motor from VFD mode to Bypass mode upon receipt of a dry contact closure from the Fire / Smoke Control System. The Smoke Control Override Mode action is not programmable and will always function as described in the bypass User's Manual documentation. In this mode, the system will ignore low priority safeties and acknowledge high priority safeties as required by UL 864/UUKL. All keypad control, serial communications control, and normal customer start / stop control inputs will be disregarded. This Smoke Control Mode must be designed to meet the intent of UL864/UUKL.
28. Fireman's Override Mode (Override 2) – the bypass must include a second, programmable override input which will allow the user to configure the unit to acknowledge some digital inputs, all digital inputs, ignore digital inputs or any combination of the above. This programmability allows the user to program the bypass unit to react in whatever manner the Fire department of New York requires. The Override 2 action may be programmed for "Run-to-Destruction". The user may also force the unit into Override 2 via the serial communications link.
29. Class 10, 20, or 30 (programmable) electronic motor overload protection must be included.
30. The VFD product warranty must include all parts, labor, travel time and expenses. A toll free 24/365 technical support line must be available.
31. For stair pressurization fans, provide engraved, permanently attached red-faced label, minimum 6" x 6" with the following language "Caution: This VFD is part of the Life Safety Smoke Control System. Notify the facility staff prior to any change or maintenance activity to this drive."

1.6 QUALIFICATIONS

A. VFDs and options must be UL listed as a complete assembly. VFD's that require the customer to supply external fuses for the VFD to be UL listed are not acceptable. VFDs with red label UL stickers, requiring additional branch circuit protection are not acceptable. The base VFD must be UL listed for 100 KAIC without the need for input fuses.

B. The entire VFD enclosure, including the bypass must be seismically certified and labeled as such in accordance with the 2006 International Building Code (IBC):
   1. VFD manufacturer must provide Seismic Certification and Installation requirements at time of submittal.
   2. Seismic importance factor of 1.5 rating is required, and must be based upon actual shake test data as defined by ICC AC-156.
   3. Seismic ratings based upon calculations alone are not acceptable. Certification of Seismic rating must be based on testing done in all three axis of motion.

C. The VFD manufacturer must have available a comprehensive, HVAC Drive Computer Based Training (CBT) product. The CBT product must include detailed, interactive sections covering VFD unpacking, proper mechanical and electrical installation and programming. The CBT product must allow the user to

provide just-in-time instructions to new personnel or refresher instructions for maintenance and repair personnel on the user's site. The CBT product must be repeatable, precise and must include record keeping capability. The CBT product must record answers to simulations and tests by student ID number. The CBT product must be professionally produced and have interactive sections, student tests, and include video clips of proper wiring and installation.

1.7 WARRANTY

A. The VFD product warranty will be 2 years from the date of Substantial Completion, not to exceed 30 months from the date of shipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. ABB ACH Series.
   2. Yaskawa
   3. Square D
   4. Or approved equal

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 VFD INSTALLATION

A. Installation must be the responsibility of the Contractor. The Contractor must install the drive in accordance with the recommendations of the VFD manufacturer as outlined in the VFD installation manual.

B. Power wiring must be completed by the electrical contractor, to NEC code 430.122 wiring requirements based on the VFD input current. Caution: VFDs supplied without internal reactors have substantially higher input current ratings, which may require larger input power wiring and branch circuit protection. The Contractor must complete all wiring in accordance with the recommendations of the VFD manufacturer as outlined in the installation manual.

END OF SECTION 23 05 15

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SECTION 23 05 23 - GENERAL-DUTY VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Gate valves.
   2. Globe valves.
   3. Ball valves.
   4. Plug valves.
   5. Check valves.

B. Related Sections:
   1. Section 23 05 03 - Pipes and Tubes for HVAC Piping and Equipment: Product and installation requirements for piping materials applying to various system types.
   2. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment: Product and installation requirements for pipe hangers and supports.
   3. Section 23 07 00 - HVAC Insulation: Product and installation requirements for insulation for valves.
   4. Section 23 23 00 - Refrigerant Piping: Product and installation requirements for valves and piping specialties used in refrigeration systems.

1.3 REFERENCES

A. ASTM International:
   1. ASTM A216/A216M - Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service.

B. Manufacturers Standardization Society of the Valve and Fittings Industry:
   1. MSS SP 70 - Cast Iron Gate Valves, Flanged and Threaded Ends.
   2. MSS SP 71 - Cast Iron Swing Check Valves, Flanged and Threaded Ends.
   3. MSS SP 78 - Cast Iron Plug Valves, Flanged and Threaded Ends.
   4. MSS SP 80 - Bronze Gate, Globe, Angle and Check Valves.
   5. MSS SP 85 - Cast Iron Globe & Angle Valves, Flanged and Threaded.
   6. MSS SP 110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

C. Underwriters Laboratories Inc.:
   1. UL 842 - Valves for Flammable Fluids.

D. Code Compliance:
   1. Furnish materials in accordance with NYCBC and NYCMC.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit manufacturers catalog information with valve data and ratings for each service.

C. Manufacturer's Installation Instructions: Submit hanging and support methods, joining procedures.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of valves.

B. Operation and Maintenance Data: Submit installation instructions, spare parts lists, exploded assembly views.

C. Valve charts and tags.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Perform Work in accordance with NYCBC.

C. All valves must have a rating exceeding system operating pressure at system temperature and not less than a minimum working pressure of 125 psig or 150 psig.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing work of this section with minimum three (3) years documented experience approved by manufacturer.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Do not install valves underground when bedding is wet or frozen.

PART 2 - PRODUCTS

2.1 GATE VALVES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Crane Valve, North America
2. Milwaukee Valve Company
3. NIBCO, Inc.
4. Stockham Valves & Fittings
5. Or approved equal

B. 2 inches and Smaller: MSS SP 80, Class 125, bronze body, bronze trim, threaded bonnet, non-rising stem, hand-wheel, inside screw with back-seating stem, solid wedge disc, alloy seat rings, threaded ends.

C. 2-1/2 inches and Larger: MSS SP 70, Class 125, cast iron body, bronze trim, bolted bonnet, rising stem, hand-wheel, outside screw and yoke, solid wedge disc with bronze seat rings, flanged ends. Furnish chain-wheel operators for valves 6 inches and larger mounted over 8 feet above floor.

2.2 GLOBE VALVES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Crane Valve, North America
2. Milwaukee Valve Company
3. NIBCO, Inc.
4. Stockham Valves & Fittings
5. Or approved equal

B. 2 inches and Smaller: MSS SP 80, Class 125, bronze body, bronze trim, threaded bonnet, hand wheel, teflon composition disc, threaded ends.

C. 2-1/2 inches and Larger: MSS SP 85, Class 125, cast iron body, bronze trim, hand wheel, outside screw and yoke, flanged ends. Furnish chain-wheel operators for valves 6 inches and larger mounted over 8 feet above floor.

2.3 BALL VALVES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Crane Valve, North America
2. Milwaukee Valve Company
3. NIBCO, Inc.
4. Stockham Valves & Fittings
5. Or approved equal

B. 2 inches and Smaller: MSS SP 110, 400 psi WOG, one piece bronze body, chrome plated brass ball, full port, teflon seats, blow-out proof stem, solder or threaded ends, lever handle with balancing stops.

C. 1/4 inch to 1 inch: MSS SP 110, Class 125, two-piece, threaded ends, bronze body, chrome plated bronze ball, reinforced teflon seats, blow-out proof stem, lever handle, UL 842 listed for flammable liquids and LPG, full port.

D. 1-1/4 inches to 3 inches: MSS SP 110, Class 125, two-piece, threaded ends, bronze body, chrome plated bronze ball, reinforced teflon seats, blow-out proof stem, lever handle, UL 842 listed for flammable liquids and LPG, conventional port.

2.4 PLUG VALVES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. DeZURIK, Unit of SPX Corp.
2. Flow Control Equipment, Inc.
3. Homestead Valve
4. Or approved equal

B. 2 inches and Smaller: MSS SP 78, Class 150, semi-steel construction, rectangular port, full pipe area, pressure lubricated, teflon packing, threaded ends. Furnish one plug valve wrench for every ten plug-valves with minimum of one wrench.

C. 2-1/2 inches and Larger: MSS SP 78, Class 150, semi-steel construction, rectangular port, full pipe area, pressure lubricated, teflon packing, flanged ends. Furnish worm gear operated.

2.5 CHECK VALVES

A. General Requirements:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane Valve, North America
b. Milwaukee
c. Jamesbury
d. Stockham Valves & Fittings
e. Or approved equal

B. Horizontal Swing Check Valve:
1. 2 inches and Smaller: MSS SP 80, Class 150, bronze body and cap, bronze seat, Buna-N disc, solder or threaded ends.
2. 2-1/2 inches and Larger: MSS SP 71, Class 125, cast iron body, bolted cap, bronze or cast iron disc, renewable disc seal and seat, flanged ends.
3. 2 inches and Smaller: MSS SP 80, Class 200, bronze body and cap, Y-pattern, bronze regrinding disc, solder or threaded ends.
4. 2-1/2 inches and Larger: MSS SP 71, Class 250, cast iron body, bolted cap, bronze or cast iron disc, flanged ends.
5. Provide valves capable of being refitted while the valve remains in the line.

C. Wafer Check Valves:
1. Class 250, cast-iron body; with replaceable bronze seat, and non-slam design lapped and balanced twin bronze flappers and stainless steel trim and torsion spring.
2. Provide valves designed to open and close at approximately 1-foot differential pressure.

D. Lift Check Valves, 2 inches and Smaller:
   1. Class 125; cast-bronze body and cap conforming to ASTM B 62; horizontal or angle pattern, lift-type valve, with stainless steel spring, bronze disc holder with renewable "Teflon" disc, and threaded ends.
   2. Provide valves capable of being refitted and ground while the valve remains in the line.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify piping system is ready for valve installation.

B. Examine valve interior through the end ports for cleanliness, freedom from foreign matter and corrosion. Remove special packing materials, such as blocks used to prevent disc movement during shipping and handling.

C. Actuate valve through an open-close and close-open cycle. Examine functionally significant features such as guides and seats made accessible by such actuation. Following examination, return the valve closure member to the shipping position.

D. Examine threads on both valve and the mating pipe for form (i.e., out-of-round or local indentation) and cleanliness.

E. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length and material. Check gasket material for proper size, material composition suitable for service and freedom from defects and damage.

F. Prior to valve installation, examine the piping for cleanliness, freedom from foreign materials and proper alignment.

G. Replace defective valves with new valves.

H. All steam pipe joints and fittings must be inspected for welding defects by an approved Testing and Inspection Agency retained by the Contractor, per NYC Building Code.

I. Report and inspection data must be submitted after completion of work and/or remediation of defective welding that have been discovered during inspection and X-Ray testing procedures.

J. Radiographic testing in high and medium pressure steam (piping systems) must be performed per NYCMC and Con Edison regulations.

K. Any weld deemed defective, in the opinion of the certified welding inspection and testing agency, must be ground out for the full depth and re-welded to the testing agency's satisfaction, at no cost to the City of New York.

3.3 INSTALLATION

A. Install valves with stems upright or horizontal, not inverted.

B. Install brass male adapters at both ends of the valves in copper piping system.

C. Install 3/4 inch ball valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.

D. Install valves with clearance for installation of insulation and allowing access.

E. Provide access where valves and fittings are not accessible. Coordinate size and location of access doors with Section 08 31 00.

F. Valves must be installed so they will be readily accessible. For operation of valves not accessible for direct operation, furnish and install chain wheel, guide and sufficient length of chain to operate from floor level. Provide hooks for fastening chains out of the way. No valve will be installed with the handle pointing downward. If, in the opinion of the Commissioner, valves have been installed as to create a hazardous and unsafe condition, Contractor must make corrections as directed by the Commissioner, without additional charge to the City of New York.

G. Valves in Mechanical or Fan Rooms more than 8'-0" above the floor must be chain operated, with either double end chain wrenches or chain wheels.

H. Systems must be supplied with valves in all branch mains, risers, drains, at all pumps, equipment, cooling coils, at all automatic valves and at all apparatus using steam or chilled water so located and arranged to give complete isolation and regulating control of the water.

I. The entire system must be supplied with valves so located, arranged and operated as to give a complete regulating control to all fixtures and apparatus. Shut-off valves must be provided on all risers, branch lines, branch lines from mains, mains and at each piece of equipment or fixture. Every section of branch supply and return piping and all risers of all services must be controlled by a valve at the main. Every item of equipment must be independently isolated by means of valves.

J. Valves, except as noted, must be properly supported, independent of the piping.

K. Valves in copper tubing must have soldered or brazed ends.

L. Valves, where exposed and used in connection with finished piping, must be same finish as the pipe.

M. Valve manufacturer's representative must instruct building operating personnel in proper maintenance of plug valves. Furnish equipment and lubricant for one (1) year service.

N. Furnish and connect to all valves, brass tags, polished or lacquered with stamp lettering or numbers filled in with black paint. Also furnish a schedule of all valve tags, framed in a polished hardwood frame and covered with plate glass.

3.4 VALVE APPLICATIONS

A. Valves 2-1/2 inches and smaller used for water shutoff must be ball valve type.

B. Valves 2-1/2 inches and smaller used for hydronic bypass or for flow control must be ball valve type. All by pass or flow control valves in steam piping must be of the globe type.

C. Check valves used for water piping, 2 inches and smaller, must be all bronze swing check valves with finished bronze trimmings and brazed or threaded ends.

D. Check valves used for water piping, 2-1/2 inches and larger, must be cast iron body, bronze trimmings, swing check valves with flanged ends.

E. Gate valves must be of the solid wedge type and must be provided with gland and packing boxes and have top seat for packing under pressure when wide open.

F. Valves for steam shut-off must be gate type. Valves for steam throttling, control must be globe type.

END OF SECTION 23 05 23

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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. Pipe hangers and supports.
2. Hanger rods.
3. Inserts.
4. Flashing.
5. Equipment curbs.
6. Sleeves.
7. Mechanical sleeve seals.
8. Formed steel channel.
9. Firestopping relating to HVAC work.
10. Firestopping accessories.
11. Equipment bases and supports.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Execution requirements for placement of concrete housekeeping pads specified by this section.
2. Section 23 05 03 - Pipes and Tubes for HVAC Piping and Equipment: Execution requirements for placement of hangers and supports specified by this section.
3. Section 23 05 48 - Noise and Vibration Controls for HVAC Piping and Equipment: Product and execution requirements for vibration isolators.

1.3 REFERENCES

A. American Society of Mechanical Engineers:
1. ASME B31.1 - Power Piping.
2. ASME B31.5 - Refrigeration Piping.
3. ASME B31.9 - Building Services Piping.

B. ASTM International:
1. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E119 - Method for Fire Tests of Building Construction and Materials.
3. ASTM E814 - Test Method of Fire Tests of Through Penetration Firestops.
4. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
5. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

C. American Welding Society:
   1. AWS D1.1 - Structural Welding Code - Steel.

D. FM Global:
   1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.

E. Manufacturers Standardization Society of the Valve and Fittings Industry:
   1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
   2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
   3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
   4. MSS SP 77 - Guidelines for Supports – Contractual Relationship
   5. MSS SP-127 - Bracing for Piping Systems

F. Underwriters Laboratories Inc.:
   1. UL 263 - Fire Tests of Building Construction and Materials.
   2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
   3. UL 1479 - Fire Tests of Through-Penetration Firestops.
   4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
   5. UL - Fire Resistance Directory.

G. Intertek Testing Services (Warnock Hersey Listed):
   1. WH - Certification Listings.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate system layout with location including critical dimensions, sizes, and pipe hanger, guide, anchor and support locations and detail of trapeze hangers. Include the following:
   1. Manufacturer’s technical literature showing hanger type (per MSS SP-69 Standard) material of construction, loading capacity and installation data.
   2. Hanger assembly details, including multiple supports and riser supports.
   3. Pipe attachment details for insulated lines including seismic restraints.
   4. Details of anchors, guides and restraints.
   5. Contractor must submit pull-out strength for all inserts to the Commissioner for review.
   6. Calculated load force on each support point.

C. Product Data:
   1. Hangers and Supports: Submit manufacturers catalog data including load capacity.
   2. Firestopping: Submit data on product characteristics, performance and limitation criteria.

D. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.

E. Engineering Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers. Indicate calculations used to determine load carrying capacity of trapeze, multiple pipe, and riser support hangers. Submit calculations sealed by a Professional Engineer licensed in the State of New York.

F. Manufacturer's Installation Instructions:
   1. Hangers and Supports: Submit special procedures and assembly of components.
   2. Firestopping: Submit preparation and installation instructions.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

H. Engineering Judgments: For conditions not covered by UL or WH listed designs, submit judgments by a Professional Engineer licensed in the State of New York, suitable for presentation for acceptance as meeting code fire protection requirements.

I. Piping Layout Drawings:
   1. Provide piping layouts for all HVAC piping systems at same scale as ductwork shop drawings; where such piping is shown on the coordination drawings, separate piping shop drawings for the same area must also be submitted. Piping shop drawings must show all hangers and supports, fittings, valves, strainers and accessories. They must show all sections necessary to establish pipe elevations, must identify hanger types and loads, and show all tie-ins to structure.

J. Engineering Data:
   1. Before any anchor or support system is installed, submit engineering data drawings to the Commissioner for review indicating how performance standards specified here must be met. The Contractor is responsible for the structural design and supports for these systems and must show the proposed systems on these drawings.
   2. These drawings must show all load conditions and design calculations relative to connections, fastening devices and anchorage, as well as size and gauge of members. Calculations and drawings must be prepared by a Professional Engineer licensed in the State of New York and must be signed and sealed by this Engineer.

K. Sleeve Layout Drawings: Indicating sleeves in foundation walls, slabs and roofs, grade beams, footings, sound isolation partitions and ceilings.

L. Concrete Pull-out Tests:
   1. Contractor must provide on-site testing by an accredited testing laboratory, demonstrating compliance with specifications. Testing must be performed to the loading requirements of the New York City Building Code or by requirements of the Contract Documents or 5x the load being placed on the most heavily loaded anchor/support; whichever is most restrictive. Test a minimum of 3 anchors/supports in each zone, of each floor, evenly distributed over the area where anchors/supports will be installed. Tested anchors/supports can be used in the final assemblies. Submit reports to Commissioner.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Through Penetration Firestopping of Fire Rated Assemblies: UL 1479 or ASTM E814 with 0.10 inch water gage minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
   1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
   2. Floor and Roof Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.

a. Floor Penetrations Within Wall Cavities: T-Rating is not required.

C. Through Penetration Firestopping of Non-Fire Rated Floor and Roof Assemblies: Materials to resist free passage of flame and products of combustion.
1. Noncombustible Penetrating Items: Noncombustible materials for penetrating items connecting maximum of three stories.
2. Penetrating Items: Materials approved by the Commissioner for penetrating items connecting maximum of two stories.

D. Fire Resistant Joints in Fire Rated Floor, Roof, and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire resistant rating as indicated on Drawings for assembly in which joint is installed.

E. Fire Resistant Joints Between Floor Slabs and Exterior Walls: ASTM E119 with 0.10 inch water gage minimum positive pressure differential to achieve fire resistant rating as indicated on Drawings for floor assembly.

F. Surface Burning Characteristics: 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

G. Perform Work in accordance with applicable authority for welding hanger and support attachments to building structure.

H. Perform Work in accordance with NYCBC.

1.6 PERFORMANCE CRITERIA

A. Anchoring/support systems must be required to comply with the following:
1. Each anchor/support must be able to hold 5x the load being placed or as required by the New York City Building Code or as required by the Contract Documents; whichever is most restrictive.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience properly trained by manufacturer.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

B. Protect from weather and construction traffic, dirt, water, chemical and damage, by storing in original packaging.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F.

B. Maintain this minimum temperature before, during, and for minimum 3 days after installation of firestopping materials.

C. Provide ventilation in areas to receive solvent cured materials.

1.11 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.12 WARRANTY

A. Furnish five-year manufacturer warranty for pipe hangers and supports.

PART 2 - PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Carpenter & Paterson, Inc.
2. Anvil (formerly Grinnell)
3. Witch
4. Or approved equal

B. Pipe hangers and supports must comply with the recommendation of Standards SP-58 and SP-69 of the Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, except where otherwise noted in the Specifications or on the Drawings.

C. The Contractor must comply with the contractual relationships recommended as stated in Standard MSS SP-77 unless otherwise noted in the Contract Documents.

D. Pipe hangers must be of the clevis, pipe-roll and pipe-clamp types.
1. Piping subject to lateral or vertical movements must be provided with supports of the spring hanger type. Refer to Section 23 05 48, Noise and Vibration Controls for HVAC Piping and Equipment, for Spring Hanger Requirements. No exceptions to this will be granted.

E. Pipe hangers must be connected to the building structure as follows:
1. All piping may be supported by inserts with sufficient holding capacity to support twice the calculated dead load. No expansion bolts will be permitted without written permission from the Commissioner.

F. Hangers supported from miscellaneous floor steel must have approved I-beam clamps. I-beam clamps for hangers supporting piping 2 inches and smaller must be adjustable side beam clamp. Piping must be 2-1/2 inches and larger. I-beam clamps must be Universal forged steel beam clamps with nut right-hand thread.

G. Provide all auxiliary steel necessary to transmit loads for piping and equipment installed to building beams.

H. Hydronic Piping:
1. Conform to ASME B31.9, ASTM F708, MSS SP58, MSS SP69 and MSS SP89.
2. Hangers for Pipe Sizes 1/2 to 1-1/2 inches: Carbon steel, adjustable swivel, split ring.
3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
4. Wall Support for Cold Pipe Sizes 3 inches and Smaller: Cast iron hooks.
5. Vertical Support: Steel riser clamp.

I. Refrigerant Piping:
1. Conform to ASME B31.5, ASTM F708, MSS SP58, MSS SP69 and MSS SP89.
2. Hangers for Pipe Sizes 1/2 to 1-1/2 inches: Carbon steel, adjustable swivel, split ring.
3. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
6. Vertical Support: Steel riser clamp.
7. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
8. Copper Pipe Support: Copper-plated carbon-steel ring.

J. Trapeze and Clevis Hangers:
1. Where two or more lines run parallel and adjacent to each other, trapeze hangers may be used.
2. Secure pipes supported by trapeze hangers and not mounted on pipe rolls to trapeze with hold down pipe clamps or "J" bolts.
3. Support vertical piping passing through slabs with pipe clamps installed above slab, unless they are subject to expansion or contraction.

K. Roller Hangers:
1. Support hot lines (steam, hot water, steam condensate) 2 inches and larger on roller hangers. Support chilled water lines with straight runs (longer than 150 feet) on roller hangers.

L. Saddles and Shields:
1. Provide protective galvanized shield for supporting insulated lines 1-1/2 inches and smaller.
2. Provide galvanized saddles and roller hangers for supporting hot insulated lines 2 inches and larger and hard insulation for supporting cold insulated lines 2 inches and larger.
3. Insert insulation identical to pipe insulation in void between saddle and pipe.

2.2 ACCESSORIES

A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

2.3 INSERTS

A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms for formed concrete. Provide steel metal deck ceiling bolts with threaded rod attachment for concrete with metal decking. Size inserts to suit threaded hanger rods. Inserts and loading must be reviewed and approved by the Commissioner.

B. In areas where the concrete slab is exposed, inserts must be installed flush with slab surface.

C. Where inserts are missed, drill through concrete slab and provide rod with recessed square steel plate and nut above slab. Under certain conditions, and only with written approval of the Commissioner, double expansion anchors meet Federal Specification FF-S-325C, as manufactured by HILTI, Anvil (formerly Grinnell), Carpenter & Paterson, Inc. or approved equal, having BS&A number, may be installed in existing slabs.

2.4 FLASHING

A. Metal Flashing: 26 gage thick galvanized steel.

B. Metal Counterflashing: 22 gage thick galvanized steel.

C. Lead Flashing:
1. Waterproofing: 5 lb./sq. ft sheet lead.
2. Soundproofing: 1 lb./sq. ft sheet lead.

D. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.

E. Caps: Steel, 22 gage minimum; 16 gage at fire resistant elements.

2.5 EQUIPMENT CURBS

A. Fabrication: Welded 18 gage galvanized steel shell and base, mitered 3 inch cant, variable step to match roof insulation, 1-1/2 inch thick insulation, factory-installed wood nailer.

2.6 ROOF-MOUNTED PIPING

A. Support on minimum 1-1/2” x 1/1-2” x 1/2” angle iron framing with roof-mounted concrete anchor, appropriately flashed and counter flashed to roofing system. Horizontal support angle must be a minimum of 18 inches above finished roof.

2.7 SLEEVES

A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage thick galvanized steel.

B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Schedule 40 Steel pipe or 18 gage thick galvanized steel.

C. Sleeves for Round Ductwork: Galvanized steel.

D. Sleeves for Rectangular Ductwork: Galvanized steel.

E. Sealant: Acrylic; refer to Section 07 92 00.

2.8 MECHANICAL SLEEVE SEALS

A. Manufacturers: Subject to compliance with requirement, provide products by one of following:
1. Thunderline Link-Seal, Inc.
2. NMP Corporation

3. Metraflex
4. Or approved equal

B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.9 FORMED STEEL CHANNEL

A. Manufacturers: Subject to compliance with requirement, provide products by one of following:
1. Allied Tube & Conduit Corp.
2. B-Line Systems
3. Omco
4. Or approved equal

B. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

2.10 FIRESTOPPING

A. Manufacturers: Subject to compliance with requirement, provide products by one of following:
1. Dow Corning Corp.
2. Fire Trak Corp.
3. Hilti Corp.
4. International Protective Coating Corp.
5. 3M fire Protection Products
6. Specified Technology, Inc.
7. Or approved equal

B. Definitions:
1. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

C. System Description:
1. Firestopping Materials: UL 1479 to achieve fire ratings as noted on Architectural Drawings for adjacent construction, but not less than 1 hour fire rating.
   a. Ratings may be 3-hours for firestopping in through-penetrations of 4-hour fire rated assemblies unless otherwise required by applicable codes.
2. Surface Burning: ASTM E84 with maximum flame spread / smoke developed rating of 25/450.
3. Firestop interruptions to fire rated assemblies, materials, and components.

D. Performance Requirements:
1. Firestopping: Conform to applicable code for fire resistance ratings and surface burning characteristics.
2. Firestopping: Provide certificate of compliance from NYC Building Code indicating approval of materials used.

E. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
   1. Silicone Firestopping Elastomeric Firestopping: Multiple component silicone elastomeric compound and compatible silicone sealant.
   2. Foam Firestopping Compounds: Multiple component foam compound.
   3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
   4. Fiber Stuffing and Sealant Firestopping: Composite of ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
   5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
   6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
   7. Firestop Pillows: Formed mineral fiber pillows.

F. Color: Full range of colors must be available to be selected by the Commissioner.

2.11 FIRESTOPPING ACCESSORIES

A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.

B. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

C. General:
   1. Furnish UL listed products or products tested by independent testing laboratory.
   2. Select products with rating not less than rating of wall or floor being penetrated.

D. Non-Rated Surfaces:
   1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where piping is exposed.
   2. For exterior wall openings below grade, furnish mechanical sealing device to continuously fill annular space between piping and cored opening or water-stop type wall sleeve.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify openings are ready to receive sleeves.

B. Verify openings are ready to receive firestopping.

3.3 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.

B. Remove incompatible materials affecting bond.

C. Obtain permission from Commissioner before using powder-actuated anchors.

D. Do not drill or cut structural members.

3.4 INSTALLATION - INSERTS

A. Install inserts for placement in concrete forms.

B. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches and larger.

D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.5 INSTALLATION - PIPE HANGERS AND SUPPORTS

A. Install in accordance with ASME B31.1, ASTM F708, MSS SP 58, MSS SP 69, MSS SP 89 and NYCMC.

B. Support horizontal piping as scheduled.

C. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.

D. Place hangers within 12 inches of each horizontal elbow.

E. Use hangers with 1-1/2 inch minimum vertical adjustment.

F. Support vertical piping at every floor.

G. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.

H. Support riser piping independently of connected horizontal piping.

I. Provide copper plated hangers and supports for copper piping.

J. Provide hangers for pipe movement without disengagement of supported pipe.

K. Prime coat steel hangers and supports. Refer to Section 09 90 00. Underground hangers must be painted with two (2) coats of black asphlatum.

L. Provide clearance in hangers and from structure and other equipment for installation of insulation. Refer to Section 22 07 00.

M. Provide all necessary hangers and supports to keep piping in proper alignment and prevent transmission of injurious thrusts and vibrations. In all cases where hangers, brackets, etc., are supported from concrete construction, care must be taken not to weaken concrete or penetrate waterproofing. All hangers and supports must be capable of screw adjustment after piping is erected with a locking nut provided to prevent loss of adjustment due to pipe vibration. Hangers supporting piping expansion loops, bends and offsets must be secured to the building structure in such a manner that horizontal adjustment perpendicular to the run of piping supported may be made to accommodate displacement due to expansion. All such hangers must be finally adjusted, both in the vertical and horizontal direction, when the supported piping is hot. All supports and components must be rated for a minimum of two times the calculated dead load.

3.6 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment. Refer to Section 03 30 00.

B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.

C. Construct supports of formed steel channel. Brace and fasten with flanges bolted to structure.

D. Provide rigid anchors for pipes after vibration isolation components are installed. Refer to Section 23 05 48.

3.7 INSTALLATION - FLASHING

A. Provide flexible flashing and metal Counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.

B. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms for sound control.

C. Provide curbs for roof installations 24 inches minimum high above roofing surface. Flash and counter-flash with sheet metal; seal watertight. Attach Counterflashing to equipment and lap base flashing on roof curbs. Flatten and solder joints.

D. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.8 INSTALLATION - SLEEVES

A. Exterior watertight entries: Seal with mechanical sleeve seals.

B. Set sleeves in position in forms. Provide reinforcing around sleeves.

C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

D. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.

E. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with firestopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

F. Install chrome plated steel escutcheons at finished surfaces.

3.9 INSTALLATION - FIRESTOPPING

A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, and other items, requiring firestopping.

B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.

C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating to uniform density and texture.

D. Place intumescent coating in sufficient coats to achieve rating required.

E. Fire Rated Surface:
   1. Seal opening at floor, wall, partition, ceiling, and roof as follows:
      a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
      b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
      c. Pack void with backing material.
      d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.
   2. Where conduit and wireway penetrate fire rated surface, install firestopping product in accordance with manufacturer's instructions.

F. Non-Rated Surfaces:
   1. Seal opening through non-fire rated wall, partition floor, ceiling, and roof opening as follows:
      a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
      b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
      c. Install type of firestopping material recommended by manufacturer.
   2. Install escutcheons floor plates or ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.
   3. Exterior wall openings below grade: Assemble rubber links of mechanical sealing device to size of piping and tighten in place, in accordance with manufacturer's instructions.
   4. Interior partitions: Seal all pipe penetrations. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.

3.10 FIELD QUALITY CONTROL

A. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.11 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.12 PROTECTION OF FINISHED WORK

A. Protect adjacent surfaces from damage by material installation.

3.13 SCHEDULES

A. Copper and Steel Pipe Hanger Spacing:

PIPE SIZE Inches	COPPER TUBING MAXIMUM HANGER SPACING Feet	STEEL PIPE MAXIMUM HANGER SPACING Feet	COPPER TUBING HANGER ROD DIAMETER Inches	STEEL PIPE HANGER ROD DIAMETER Inches
Up to 1-1/2	6	6	1/2	3/8
2	8	8	1/2	1/2
2-1/2	10	10	5/8	5/8
3	10	10	5/8	5/8

1. When several pipes rest on a common hanger, increase rod diameter accordingly, and spacing noted above must remain.

END OF SECTION 23 05 29

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SECTION 23 05 48 - NOISE AND VIBRATION CONTROLS 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. Vibration isolators.
   2. Duct silencers.
   3. Acoustical louvers.

B. Related Sections:
   1. Section 03 30 00 - Cast-In-Place Concrete: Execution requirements for placement of isolators in floating floor slabs specified by this section and product requirements for concrete for placement by this section.
   2. Section 07 92 00 - Joint Protection: Product requirements for joint sealers specified for placement by this section.
   3. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment: Product requirements for pipe hangers and supports.
   4. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC: Requirements for sound and vibration measurements performed independent of this section.
   5. Section 23 33 00 - Air Duct Accessories: Product requirements for both solid and flexible duct connectors for duct silencers specified for placement by this section.

1.3 REFERENCES

A. Air Movement and Control Association International, Inc.:
   1. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.

B. American National Standards Institute:
   1. ANSI S1.4 - Sound Level Meters.
   2. ANSI S1.8 - Reference Quantities for Acoustical Levels.
   3. ANSI S1.13 - Methods for the Measurement of Sound Pressure Levels in Air.
   4. ANSI S12.36 - Survey Methods for the Determination of Sound Power Levels of Noise Sources.

C. Air-Conditioning and Refrigeration Institute:
   1. ARI 575 - Method of Measuring Machinery Sound within Equipment Space.

D. American Society of Heating, Refrigerating and Air Conditioning Engineers:
   1. ASHRAE 68 - Laboratory Method of Testing In-Duct Sound Power Measurement Procedure for Fans.

2. ASHRAE Handbook - HVAC Applications.

E. ASTM International:
1. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
2. ASTM E477 - Standard Test Method for Measuring Acoustical and Airflow Performance of Duct Liner Materials and Prefabricated Silencers.
3. ASTM E596 - Standard Test Method for Laboratory Measurement of the Noise Reduction of Sound-Isolating Enclosures.

F. Sheet Metal and Air Conditioning Contractors':
1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.4 PERFORMANCE REQUIREMENTS

A. Provide vibration isolation on motor driven equipment over 0.5 hp, which is connected piping and ductwork.

B. Provide minimum static deflection of isolators for equipment as follows:
1. Upper Floors, Critical
   a. Under 400 rpm: 3.5 inch
   b. 400 - 600 rpm: 3.5 inch
   c. 600 - 800 rpm: 3.5 inch
   d. 800 - 900 rpm: 2 inch
   e. 1100 - 1500 rpm: 1 inch
   f. Over 1500 rpm: 0.5 inch

C. Consider upper floor locations critical unless otherwise indicated.

D. Maintain sound level of spaces at levels not to exceed those listed below by utilizing acoustical devices.

E. Maintain rooms at following maximum sound levels, in Noise Criteria (NC) as defined by ASHRAE Handbook., HVAC Applications:
1. Offices:
   a. Executive: 25
   b. Conference rooms: 25
   c. Private: 30
   d. Computer/business machine areas: 40
   e. Public circulation: 40
   f. Public areas: 40
2. Libraries: 30

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

B. Shop Drawings: Indicate inertia bases and locate vibration isolators, with static and dynamic load on each. Indicate assembly, materials, thickness, dimensional data, pressure losses, acoustical performance, layout, and connection details for sound attenuation products fabricated for this project.

C. Product Data: Submit schedule of vibration isolator type with location and load on each. Submit catalog information indicating, materials, dimensional data, pressure losses, and acoustical performance for standard sound attenuation products.

D. Design Data: Submit calculations indicating maximum room sound levels are not exceeded.

E. Test Reports: Indicate dynamic insertion loss and noise generation values of silencers. Acoustic housings meet or exceed specified sound transmission loss values.

F. Manufacturer's Installation Instructions: Submit special procedures and setting dimensions. Indicate installation requirements maintaining integrity of sound isolation.

G. Manufacturer's Certificate: Certify isolators meet or exceed specified requirements.

H. Manufacturer's Field Reports: Indicate sound isolation installation is complete and in accordance with instructions.

I. Submit shop drawings for the items listed below. The shop drawings must be complete when submitted and must be presented in a clear, easily understood form. Incomplete or unclear presentation of shop drawings may be reason for rejection.
   1. A complete description of products to be supplied, including product data, dimensions, specifications and installation instructions.
   2. Detailed selection data for each vibration isolator supporting equipment, including:
      a. The equipment identification mark
      b. The isolator type
      c. The actual load
      d. The static deflection expected under the actual load
      e. The specified minimum static deflection
   3. Steel rails, steel base frames and concrete inertia bases showing all steel work, reinforcing, vibration isolator mounting attachment method and location of equipment attachment bolts.
   4. Details required to convey complete understanding of work.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of acoustic housings and ductwork lagging. Record actual locations of hangers including attachment points.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Perform Work in accordance with AMCA 300, ANSI S1.13, ARI 575, ANSI S12.36 standards and recommendations of ASHRAE 68.

C. All vibration isolation systems including mountings and hangers must be furnished by the same manufacturer.

D. The vibration isolation systems must be designed to achieve an 80% to 95% isolation at the lowest rotational speed of the equipment regardless of the condition of the mounting floor.

E. The flexible isolators must be properly adjusted and installed in accordance with the weight distribution of the equipment to provide a stable mounting decoupled system. Each flexible isolator must be designed and installed so that the equipment support base remains level during deflection. The natural frequency for each support point, based upon the load per isolator and its stiffness, must not differ by more than plus or minus 10%.

F. The isolation system must not cause the equipment to generate any mechanical problem, mechanical failure or misalignment of the couplings and bearings.

G. Furnish information as may be required to verify that all vibration control equipment will meet static deflections and percentage of isolation reduction specified for various uses.
   1. Should operation of any system cause noise or vibration which is, in the opinion of the Commissioner, "objectionable," Contractor must make such changes in piping, equipment, etc., as may be necessary to eliminate the objectionable noise or vibration.
   2. Should the installation of any equipment or piping transmit the noise to any portion of the structure which is, in the opinion of the Commissioner, "objectionable," Contractor must install such isolation and make such changes or additions as may be necessary to prevent the transmission of the noise or vibration.

H. Particular attention is directed to the problem of preventing noise and vibration transmission from Mechanical Equipment Rooms and Fan Rooms to adjacent areas. It is of paramount importance that no noise or vibration emanating from equipment in these rooms be perceptible in adjacent areas. Contractor must incorporate in the installation all devices and accessories to accomplish this result. Such devices must include vibration eliminator bases and sound absorber pads, muffler at air compressor air intakes, acoustical lining or sound traps at fresh air intake louvers, and other sound insulation, all as may be required.

I. All electrical connections, drain connections, piping connections, etc., made to equipment which rests on vibration isolators must be sufficiently flexible to permit the equipment to be properly installed.

J. When concrete pads are called for to be under isolation, they must be extended to span at least 2 of the supporting beams and they must be reinforced with rods or mesh so that the concrete can act as a beam reinforcing the floor and providing a better support for the isolation. The vibration control equipment manufacturer must submit templates and weight at each support point to the Concrete Section to achieve this.

K. Where supplementary steel is required to support piping, this steel must be designed to provide a maximum deflection of 0.08 inches at the midspan under the supported load. Piping must be rigidly supported from the supplementary steel and the supplementary steel isolated from the building structure by means of isolators.

L. Acoustical Performance Specifications: It is the intent that noise levels due to air conditioning and/or ventilating equipment, ducts, grilles, registers, diffusers and air system pressure reducing devices will

permit attaining sound pressure levels in occupied spaces conforming to the following NC curves as explained in the latest issue of the ASHRAE Guide and Data Book.

M. Design isolators for equipment installed outdoors to provide adequate restraint to withstand the force of a 100 mph wind applied to any exposed surface of the isolated equipment. Isolators for outdoor equipment must have bolt holes for attachment to equipment and to supports. The vibration isolation Vendor must submit verifying shear and over turning calculations, for their product and equipment installation arrangement, stamped by a Professional Engineer licensed in the State of New York. The design and supply of miscellaneous support steel above and below isolators will not be the responsibility of the vibration isolation manufacturer.

N. Static deflection of isolators must be as provided as noted below. All static deflections stated are the minimum acceptable deflection for the mounts under actual load. Isolators selected solely on the basis of rated deflections are not acceptable and will be disapproved.

O. Vibration Criteria:
   1. Mechanical and electrical equipment operated by motors over one horsepower and unless otherwise noted, and associated piping and ductwork, must be isolated from the structure by means of resilient vibration and noise isolators supplied by a single manufacturer to the HVAC Contractor. The isolator manufacturer must include the complete design for the supplementary basis; a tabulation of the design data on the isolators including outside diameter; free, operating and solid heights of the springs; free and operating heights of the neoprene or fiberglass isolators; and isolation efficiency based on the lowest operating speed of the equipment supported.
   2. All rotating equipment must be balanced both statically and dynamically. The equipment supporting structure must not have any natural frequencies within ±20% of the operating speeds. The equipment, while operating, must not exceed a self-excited vibration velocity of 0.10 inches per second when measured with a vibration meter on the bearing caps of the machine in the vertical, horizontal and axial directions, or at the equipment mounting feet if the bearings are concealed.
   3. Vibration testing must be in accordance with procedure established by “Testing Vibration Isolation Systems”, Page 52.38 of ASHRAE HVAC Systems and Applications – 1987.
   4. When it is determined by the Commissioner that any equipment vibration exceeds the specified level, the Contractor, in consultation with the Professional Engineer must, at no cost to the City of New York, determine the source of the vibration and make the necessary corrections or replacement to reduce it to the acceptable level.

P. Sound Pressure Levels:
   1. The sound pressure levels around mechanical and electrical equipment (boilers, fans, pumps, pressure reducing valves, motors, turbines, elevators, transformers, etc.) in equipment spaces must not exceed 85 dbA at any point, 3 feet from equipment, with all equipment in the room operating. The sound criteria applies to the complete operating range of each piece of equipment.
   2. The maximum interior background sound pressure levels for the various usage areas within the building must be indicated on Table 2, “Recommended Indoor Design Goals for HVAC System Sound Control” – ASHRAE HVAC Systems and Applications – 1987, Page 52.4, or as otherwise specified. Each area, so designated, must be tested and reported for noise level with all equipment operating and space unoccupied.
   3. Equipment installed outside the building, at grade, in areaways, attached to walls, and on the roof, such as air conditioning units, refrigerant condensers, fans, air intakes, etc. must comply with all local, city, state and federal sound level regulations.

4. When equipment or space sound pressure levels exceed the specified criteria, the Contractor, in consultation with the Professional Engineer must, at no cost to the City of New York, determine the source of the noise and make the necessary corrections to reduce it to the acceptable levels.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience properly trained by manufacturer.

C. Design application of duct silencers, acoustic housings, seismic snubbers under direct supervision of a Professional Engineer licensed in the State of New York and experienced in design of this Work.

1.9 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 FLOOR MOUNTING OF FACTORY ASSEMBLED AIR HANDLING UNITS - MOUNTING TYPE IV

A. This equipment must be mounted directly on stable bare steel (non-skid) spring isolators; except that where the units to be mounted are furnished with internal structural frames and external lugs (both of suitable strength and rigidity), or without any severe overhangs, no additional structural frame need be furnished and installed beneath the unit. The motor must be integrally mounted to the unit and must be mounted on side rails. Isolator types must be one of the following:

1. Type SLR - M.I.I.
2. Type OSC - V.E.C.
3. Type ASCM - V.M.C.I.
4. Or approved equal

B. Diagonal hanger rod isolators must be provided as required to limit horizontal motion to 1/4" maximum.

C. Condensing Units must be installed with Restrained Spring isolators complete with a molded elastomeric cup or elastomeric acoustical friction pad between the bottom of isolator and the support. Quantity and spring sizes, ratings must be adequate to support all load capacities and deflection.

D. Spring diameters must be no less than 0.8” of the compressed height of the spring at rated load. For outdoor equipment, spring must be powder coated painted color.

E. Springs must have a minimum additional travel to solid equal to 50% of the operating deflection Springs must have an actual deflection of no less than 75% of the rated nominal deflection.

F. Restrained spring mountings must have a spring isolator within a rigid housing that includes vertical limit stops to prevent spring extension if weight is removed. The housing must serve as blocking during erection. A maximum clearance of ¼" must be maintained around restraining bolts and internal elastomeric deceleration bushings. Limit stops must be out of contact during normal operation. If housings are to be bolted or welded in position, there must be an internal isolation pad or elastomeric cup.

2.2 MOUNTING OF CEILING SUPPORTED FACTORY ASSEMBLED FANS, TUBULAR FANS, AXIAL FANS AND BELTED UTILITY VENT SETS - MOUNTING TYPE V

A. Hung by isolation with retainers containing steel springs and neoprene isolator element. Structural sub-base or unit integral supports if adequate as approved by the Commissioner. Isolators must be as follows:

1. Type DNHS - M.I.I.
2. Type RSH - V.M.C.I.
3. Type SNRC - V.E.C
4. Or approved equal

B. Diagonal hanger rod isolators must be provided as required to limit horizontal motion to 1/4" maximum under fan operating conditions.

2.3 MOUNTING OF REFRIGERATION MACHINE - TYPE VII

A. Each machine component (cooler-condenser and drive compressor) must be resiliently supported on steel spring isolation mountings. The motor-compressor assembly must be provided with a rigid steel structural base designed to withstand operating forces of the machine. Base must be furnished as an integral part of the machine by the manufacturer.

B. Spring mountings must incorporate unrestrained stable springs with built-in leveling device and resilient vertical limit stops to prevent spring elongation when partial load is removed. The mountings must also be capable of providing rigid anchor during erection of machine so that it can be erected at a fixed elevation.

C. Spring mountings must provide a minimum of 1-inch static deflection and must have two layers of acoustical neoprene base pads separated by 16 gauge sheet metal. Mountings must be one of the following:

1. Type SLR - M.I.I.
2. Type ASCM - V.M.C.I.
3. Type OSC - V.E.C.
4. Or approved equal

2.4 SUPPORT OF WATER PIPING

A. General: The following water piping must be resiliently supported.
1. All water piping in Mechanical Equipment Rooms.
2. All water piping located on the roof.

3. Where shown on drawings.

B. Resilient diagonal mountings or other approved devices must be provided as required to limit piping motion due to equipment startup or shutdown, to a maximum of 1/8 inch.

C. The steel spring element of the hangers or floor mounting assembly must provide 1-inch static deflection.

D. All water piping hanger rod isolators must be one of the following:
1. Type PC30N - M.I.I.
2. Type RSH - V.M.C.I.
3. Type SNRC - V.E.C.
4. Or approved equal

E. Floor supported water piping must be mounted on one of the following, or as approved:
1. Type SLR - M.I.I.
2. Type ASCM - V.M.C.I.
3. Type OSC - V.E.C.
4. Or approved equal

F. Mounting of Piping Risers:
1. Pipe riser guides, anchors and supports including piping anchors in Mechanical Equipment Rooms or occupied spaces must be isolated from the building structure such that there will be no direct metal-to-metal contact of the piping with the building structure.
2. Piping Guides:
   a. Steel guide bars must be welded to the pipe at a maximum spacing of 60 deg. The outside diameter of the opposing guide bars must be smaller than the inside diameter of the pipe riser clamp in accordance with standard field construction practice. Each end of the pipe riser clamp must be rigidly attached to an all-directional pipe anchor isolation mounting which, in turn, must be rigidly fastened to the steel framing within the shaft, as described on the drawings.
   b. The all-directional piping anchor isolation mountings must consist of a telescoping arrangement of two sizes of steel tubing separated by a minimum of 1/2 inch thick heavy duty neoprene and canvas duct isolation pad. Vertical restraints must be provided by similar material arranged to prevent vertical travel in either direction. The allowable load on the isolation material must not exceed 500 psi.
   c. Mountings must be Type ADA - Mason Industries, Vibration Eliminator Co., Korfund Dynamics or as approved.
   d. Piping must be constructed with a 360 deg. 10 gauge metal sleeve around the piping. The thermal insulation requirements for the piping must be provided between the piping and the sleeve. Heavy duty neoprene and canvas duct isolation pad of thickness equal to thermal insulation requirements must space the metal sleeve away from the piping with urethane or other suitable thermal insulation provided in the voids between the pipe sleeve and isolation pad material. The metal sleeve outside diameter must be smaller than the pipe riser clamp inside diameter in accordance with standard field construction practice. The pipe riser clamp must be rigidly attached to the steel framing within the shaft.
3. Anchors:
   a. The pipe riser clamp at anchor points must be welded to the pipe and to pairs of vertical acoustical pipe anchor mountings which, in turn, must be rigidly fastened to the steel framing in the pipe shaft.

b. The acoustical pipe anchor mountings must be capable of safely accepting loads developed by the installed piping and must consist of a bolted assembly of steel plates with laminations and 1/2 inch thick heavy duty neoprene and canvas duct isolation material. A heat shield of 1/4 inch transite must be provided. The isolation material loading must not exceed 500 psi.

c. Acoustical pipe anchor mountings must be Type VPA Mason Industries, Vibration Eliminator Co., Korfund Dynamics or as approved.

4. Supports:

a. Piping supports within shafts must be provided with suitable bearing plates and two (2) layers of 1/4 inch thick ribbed or waffled neoprene pad loaded for 50 psi maximum. The isolation pads must be separated with 1/4 inch steel plate.

b. Piping isolation supports of the base of risers must be two layers of 1/2 inch thick heavy duty neoprene and canvas duct isolation pad separated by 1/4 inch thick steel plate. Suitable bearing plates sized to provide a pad loading of 500 psi maximum must be provided. The stanchion between the pipe and isolation support must be welded to the pipe and welded or bolted to the isolation support. The isolation support must be bolted to the floor slab with resilient sleeves and washers.

c. All pipe support resilient materials must be HP Mason Industries, Vibration Eliminator Co., Korfund Dynamics or as approved.

d. Piping penetrations of shafts, floor slab and/or partitions: There must be no direct contact of piping with shaft walls, floor slabs and/or partition. All uninsulated piping must be sleeved with one inch fiberglass the full depth of the penetration.

2.5 GRILLES, REGISTERS AND DIFFUSERS

A. The maximum permissible sound power levels in octave bands of grilles, registers and diffusers when operated in an installed condition per plans and specification, will be as follows:

Maximum Sound Power Level for Terminal Devices Servicing Occupied Spaces

See Acoustical Performance Criteria
Maximum PWL (db) re 10-12 Watts

Octave Bands	NC-35	NC-40
1	62	66
2	56	60
3	50	54
4	46	51
5	43	48
6	42	47
7	41	46
8	42	47

2.6 VARIABLE AIR VOLUME BOXES

A. Discharge Noise:

1. The maximum permissible sound power levels of these units, when operated in an installed condition per plans and specifications, will be such that the resulting sound pressure levels in occupied spaces will conform to noise criteria levels as stated in "Acoustical Performance Criteria" hereinbefore

described. Low pressure duct downstream of units must be acoustically lined but length of lining must be not less than required to achieve criteria.

B. Radiated Noise:
1. Where located exposed or over occupied spaces, the maximum permissible radiated sound power levels in octave bands when operated in an installed condition per plans and specifications, will be as follows:

Octave Bands Mid/Freq. (cps)	Maximum PWL (db) re:10-12 Watts	
	NC-35	NC-40
63	72	76
125	70	74
250	61	65
500	60	64
1000	57	62
2000	56	60
4000	66	70
8000	65	70

2. The manufacturer must submit to the Commissioner guaranteed discharge and radiated sound power levels in octave bands, and must substantiate that the equipment operating in an installed condition as per plans and specifications will conform with those discussed above.
3. Should the Commissioner desire that units be checked for conformance of discharge and radiated noise to the above acoustical performance, the cost of such tests and cost of corrective measures must be borne by the manufacturer.

2.7 ACOUSTICAL PERFORMANCE WITHIN EQUIPMENT SPACES

A. Equipment room noise levels and noise transmission to adjacent buildings must comply with all State and City Noise Ordinances.

2.8 MOTOR ACOUSTICAL PERFORMANCE

A. Noise levels must be determined in accordance with IEEE Standard u/85 Test "Procedure for Air-Borne Noise Measurements on Rotating Electric Equipment."

2.9 ACOUSTICAL LINING

A. Duct lining for supply, return and exhaust air systems:
1. Duct lining must be 1-1/2 lb. per cu. ft. density Owens Corning AEROFLEX, Johns Manville, Knauf or approved equal. Unless greater thicknesses are specified, the minimum thickness installed must be 1".
   a. Duct lining must meet requirements of NFPA-90A and all materials used must have a flamespread rating of 25 or less and smoke developed rating of no higher than 50.
2. The leading edge (facing into the air flow) or each non-abutting section such as the first section facing into the fan, or the first section after a sound trap must have a metal nosing.
3. Application: All portions of duct designated to receive duct liner must be completely covered with Duct Liner. Transverse joints must be neatly butted and there must be no interruptions or gaps. The

black coated surface of the Duct Liner must face the air stream. The Duct Liner must be adhered to the sheet metal with 100% coverage of adhesive and all exposed leading edges and all transverse joints coated with adhesive. Adhesive must Duct Line, ASC-A-7001C-1972. The Duct Liner must be additionally secured with mechanical fasteners (mechanical fasteners must conform to Mechanical Fastener Standard FM-1-1971, available from Sheet Metal and Air Conditioning Contractors National Association), which will compress the Duct Liner sufficiently to hold it firmly in place. Duct Liner must be cut to assure overlapped and compressed longitudinal corner joints. Fasteners must start within 3" of the upstream transverse edges of the liner and 3" from the longitudinal joints and must be spaced at a maximum of 6" o.c. around the perimeter of the duct, except that they may be a maximum of 6" from a corner break. Elsewhere they must be a maximum of 16" o.c., except that they must be placed not more than 6" from a longitudinal joint of the liner nor 12" from a corner break.

4. The following ducts must be acoustically lined:
   a. Ductwork downstream of VAV terminal units a minimum distance of 15 feet, in all directions, or as shown on drawings.
   b. All supply and return air ductwork in mechanical equipment rooms, but not less than 30 ft. from supply fan discharge and 25 ft. from return fan inlets, in all branches and mains.
   c. Ductwork upstream of exhaust fans a minimum distance of twenty feet, in all branches or mains, unless sound traps are provided.
   d. All transfer ducts and jumper ducts.
   e. In addition to above, wherever shown on drawings.

B. Dimensions of lined ducts shown on drawings are the inside dimensions of the duct after the lining has been installed.

C. Duct liner must meet the requirements of NFPA 90A, 90B and ASTM-C 1071 and installed in accordance with SMACNA.

D. All adhesives must conform to the current South Coast Air Quality Management District (SCAQMD) Rule #1168. The Volatile Organic Compound (VOC) content must not exceed 80 grams per liter.

2.10 DUCTWORK LAGGING

A. Acoustic Insulation: 2 inch thick, 3 to 5 lb/cu ft density glass fiber or mineral wool insulation.

B. Covering: Gypsum board with surface weight minimum 4 lb/sq ft.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify equipment, ductwork and piping is installed before work in this section is started.

3.3 EXISTING WORK

A. Provide access to existing piping and ductwork and other installations remaining active and requiring access.

B. Extend existing piping and ductwork installations using materials and methods compatible with existing electrical installations.

3.4 INSTALLATION

A. Support duct silencers rigidly to ductwork. Refer to Section 23 33 00.

B. Lag ductwork, where indicated by wrapping with insulation and covering. Apply covering to be airtight. Do not attach covering rigidly to ductwork.

C. Install isolation for motor driven equipment.

D. Bases:
1. Set steel bases for 1 inch clearance between housekeeping pad and base.
2. Set concrete inertia bases for 2-inch clearance between housekeeping pad and base.

E. Adjust equipment level.

F. Install spring hangers without binding.

G. On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.

H. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.

I. Provide pairs of horizontal limit springs on fans with more than 6.0 inch static pressure, and on hanger supported, horizontally mounted axial fans.

J. All equipment, piping, etc., must be mounted on or suspended from approved foundations and supports, all as specified herein, as shown on the drawings, or as required.

K. All floor-mounted equipment must be erected on 4” high concrete pads over the complete floor area of the equipment, unless specified to the contrary herein. Wherever hereinafter vibration eliminating devices and/or concrete inertia blocks are specified, these items must, in all cases, be in turn mounted upon 4” high concrete pads unless specified to the contrary herein.

L. The vibration isolation systems must be guaranteed to have minimum one inch deflection or as indicated on the schedule or as specified.

M. Mounting sizes must be determined by the mounting manufacturer, and the sizes must be installed in accordance with the manufacturer's instruction.

N. The installed vibration isolation system for each floor or ceiling supported equipment must have a maximum lateral motion under equipment startup or shutdown conditions of l/4”. Motions in excess must be restrained by approved spring type mountings.

O. All mounting systems exposed to weather and other corrosive environments must be protected with factory applied corrosion resistive materials.

P. Where steel spring isolation systems are described in the specifications, the mounting assemblies must utilize bare springs with the spring diameter not less than 0.8 of the loaded operating height of the spring. Each spring isolator must be designed and installed so that the ends of the spring remain parallel during and after the spring has reached specified minimum deflection. Springs must have a reserve deflection of 50% of rated deflection before reaching solid.

Q. Vibration isolation equipment submittal drawings must include the following information:
1. Isolation mounting deflections.
2. Spring diameters, compressed spring heights at rated load; solid spring heights, where steel spring isolation mountings are used.
3. Equipment operating speed.

R. Unless noted otherwise, spring isolators for fans must have minimum static deflection, when operating at their lowest speed, in accordance with the following table:

FAN RPM	Minimum Static Deflection, Inches
850 or higher	1"
600 to 850	2"
400 to 600	3"

S. All neoprene isolators must have a minimum static deflection of 3/8 inch unless otherwise shown.

3.5 FIELD QUALITY CONTROL

A. Inspect isolated equipment after installation and submit report. Include static deflections.

B. After start-up, final corrections and balancing of systems take octave band sound measurements over full audio frequency range in areas adjacent to mechanical equipment rooms, duct and pipe shafts, and other critical locations. Provide one-third octave band measurements of artificial sound sources in areas indicated as having critical requirements. Submit complete report of test results including sound curves.

C. Furnish services of testing agency to take noise measurement. Use meters meeting requirements of ANSI S1.4.

END OF SECTION 23 05 48

SECTION 23 05 53 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Nameplates.
   2. Tags.
   3. Stencils.
   4. Pipe markers.
   5. Ceiling tacks.
   6. Labels.
   7. Lockout devices.

B. Related Sections:
   1. Section 09 90 00 - Painting and Coating: Execution requirements for painting specified by this section.

1.3 REFERENCES

A. American Society of Mechanical Engineers:
   1. ASME A13.1 - Scheme for the Identification of Piping Systems.
   2. The City of New York’s color code, if any.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit manufacturers catalog literature for each product required.

C. Shop Drawings: Submit list of wording, symbols, letter size, and color coding for mechanical identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

D. Samples: Submit two tags, labels and pipe markers used on project.

E. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories, and the City of New York’s color code.

C. Maintain one (1) copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience properly trained by manufacturer.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 NAMEPLATES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Craftmark Identification Systems
2. Safety Sign Co.
3. Seton Identification Products
4. Or approved equal.

B. Product Description: Laminated three-layer plastic with engraved black letters on light contrasting background color: 2” x 1” x 1/8” thick with 1/4” high characters.

2.2 TAGS

A. Metal Tags:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Craftmark Identification Systems
   b. Brady
   c. Seton Identification Products
   d. Or approved equal.
2. Brass with stamped letters; tag size minimum 2 inches diameter with finished edges.

B. Information Tags:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Craftmark Identification Systems
   b. Brady
   c. Seton Identification Products
   d. Or approved equal.
2. Clear plastic with printed "Danger," "Caution," or "Warning" and message; size 3-1/4 x 5-5/8 inches with grommet and self-locking nylon ties.

C. Tag Chart: Typewritten letter size list of applied tags and location in anodized aluminum frame.

2.3 STENCILS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Craftmark Identification Systems
2. Brady
3. Seton Identification Products
4. Or approved equal.

B. Stencils: With clean cut symbols and letters of following size:
1. Ductwork and Equipment: 2 inches high letters.

C. Stencil Paint: As specified in Section 09 90 00, semi-gloss enamel, colors and lettering size conforming to ASME A13.1.

2.4 PIPE MARKERS

A. Color and Lettering: Conform to ASME A13.1 and Commissioner’s color code.

B. Plastic Pipe Markers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Craftmark Identification Systems
   b. Brady
   c. Seton Identification Products
   d. Or approved equal.
2. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.

2.5 LABELS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Craftmark Identification Systems
2. Brady
3. Seton Identification Products
4. Or approved equal.

B. Description: Aluminum size 1.9 x 0.75 inches, adhesive backed with printed identification.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Prepare surfaces in accordance with Section 09 90 00 for stencil painting.

3.3 INSTALLATION

A. Apply stencil painting in accordance with Section 09 90 00.

B. Install identifying devices after completion of coverings and painting.

C. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.

D. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.

E. Install tags using corrosion resistant chain. Number tags consecutively by location.

F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.

G. Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with stencil painting. Identify in-line pumps and other small devices with tags.

H. Identify control panels and major control components outside panels with nameplates.

I. Identify valves in main and branch piping with tags.

J. Identify air terminal units and radiator valves with numbered tags.

K. Tag automatic controls, instruments, and relays. Key to control schematic.

L. Identify piping, concealed or exposed, with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.

M. Identify ductwork with stenciled painting. Identify with air handling unit identification number and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.

N. Provide ceiling tacks to locate valves or dampers above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

3.4 SCHEDULES

A. Provide color-coded valve schedule for each system and enclose in Lexan frame.

END OF SECTION 23 05 53

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SECTION 23 05 93 - TESTING, ADJUSTING AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
1. Testing, adjusting and balancing of air systems.
2. Testing, adjusting and balancing of hydronic, steam and refrigerating systems.
3. Measurement of final operating condition of HVAC systems.
4. Sound measurement of equipment operating conditions.
5. Vibration measurement of equipment operating conditions.

B. Related Sections:
1. Section 23 09 23 - Direct-Digital Control System for HVAC: Requirements for coordination between Direct Digital Controls system and testing, adjusting and balancing work.
2. Section 23 09 93 - Sequence of Operations for HVAC Controls: Sequences of operation for HVAC equipment.

1.3 REFERENCES

A. Associated Air Balance Council:
1. AABC MN-1 - National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems.

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
1. ASHRAE 111 - Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning and Refrigeration Systems.

C. Natural Environmental Balancing Bureau:
1. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Prior to commencing Work, submit report forms or outlines indicating adjusting, balancing, and equipment data required. Include detailed procedures, agenda, sample report forms and copy of AABC National Project Performance Guaranty or a Copy of NEBB Certificate of Conformance Certification.

C. Prior to commencing Work, submit TAB subcontractor's qualification including the past three (3) years' experience and proof of latest calibration date of each instrument.

D. Test Reports: Indicate data on either AABC MN-1 National Standards for Total System Balance forms, forms prepared following ASHRAE 111 or NEBB Report forms.

E. Field Reports: Indicate deficiencies preventing proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.

F. Submit draft copies of report for review prior to final acceptance of Project.

G. Furnish reports in soft cover, 3-ring binder manuals, complete with table of contents page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations. Reports must be signed/sealed by a Professional Engineer licensed in the State of New York.

H. Preliminary Effort:
   1. Immediately after award, review the Drawings and Specifications and indicate any deficiencies (or additional features) in the air or water systems which would preclude (or improve) proper adjusting or balancing. These include:
      a. Additional air volume dampers.
      b. Additional water balance devices.
      c. Installation of additional air flow measuring devices.
      d. Installation of additional "Peet's Plugs" ports, etc.
   2. Submit for approval sample forms that the Contractor intends to use for tabulating balancing reports which must include fan and pump or other equipment tags or labels. These forms should be similar to the AABC forms or NEBB equivalent.
   3. Describe the instrumentation (including accuracy limitations) of each device proposed for use on this project for air and water balancing. As a minimum, instrumentation usage application and accuracy limitations acceptable on this project must be those described in "HVAC Systems - Testing, Adjusting and Balancing" published by Sheet Metal and Air-Conditioning National Association, Inc. (SMACNA).

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of flow measuring stations balancing valves and rough setting.

B. Operation and Maintenance Data: Furnish final copy of testing, adjusting, and balancing report inclusion in operating and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Perform Work in accordance with NYCBC.

C. Agency: Company specializing in testing, adjusting, and balancing of systems specified in this section with minimum three (3) years documented experience certified by AABC or NEBB.

D. Perform Work under supervision of AABC Professional Engineer licensed in the State of New York and experienced in performance of this Work.

E. Perform Work in accordance with AABC MN-1 National Standards for Field Measurement and Instrumentation, Total System Balance, ASHRAE 111 or NEBB Procedural Standards for Testing, Balancing and Adjusting of Environmental Systems.

F. Prior to commencing Work, calibrate each instrument to be used. Upon completing Work, recalibrate each instrument to assure reliability.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.8 SEQUENCING

A. Sequence balancing between completion of systems tested and Date of Substantial Completion.

1.9 SCHEDULING

A. Schedule and provide assistance in final adjustment and test of life safety smoke evacuation and smoke control systems with Fire Department of New York.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify systems are complete and operable before commencing work. Verify the following:
   1. Systems are started and operating in safe and normal condition.
   2. Temperature control systems are installed complete and operable.
   3. Proper thermal overload protection is in place for electrical equipment.
   4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
   5. Duct systems are clean of debris.
   6. Fans are rotating correctly.
   7. Smoke, fire and volume dampers are in place and operational.
   8. Air coil fins are cleaned and combed.
   9. Access doors are closed and duct end caps are in place.
   10. Air outlets are installed and connected.

11. Duct system leakage is minimized. Duct leak tests are approved
12. Hydronic systems are flushed, filled, vented and pressure tested.
13. Pumps are rotating correctly.
14. Proper strainer baskets are clean and in place or in normal position.
15. Service and balancing valves are open.

3.3 PREPARATION

A. Furnish instruments required for testing, adjusting, and balancing operations.

B. Make instruments available to Commissioner to facilitate spot checks during testing.

C. Periodic Inspections of the Project During Construction
   1. Prior to commencement of balancing, make periodic inspections of the project during construction (as noted below) and must report in writing to the Commissioner any deviations from Contract Documents relating to testing, balancing, and adjustment work concerning:
      a. Equipment:
         1) Installation
         2) Placement
      b. Inaccessible installation of the following balancing hardware:
         1) Ports
         2) Plugs
         3) Balance damper handles
         4) Other such items

3.4 EXECUTION

A. Assist Division 26 trade to set up and test smoke control systems, as part of the Fire Alarm System.

B. Review the work required with the Commissioner prior to beginning of work. At least two (2) one-day inspections of the Water and Air Systems at appropriate times during construction must be made by the balancing firm and report its findings to the Commissioner. All openings, pressure taps, wells and closures required, over and above those shown on the drawings, to perform the required test and adjustments must be installed during or after construction at no additional cost to the City of New York.

C. The Contractor must furnish all services for a minimum of two complete adjustments of water systems and air handling and exhaust systems, water and air distribution and controls, for the first cooling season and for the first heating season after the job is in complete operation under load conditions.

D. During all tests, it must be demonstrated that the systems are free from leaks and that all parts of the system will operate correctly. The Balancing firm must make final adjustments to all equipment and controls as may be required for proper operation, maintaining correct temperatures in all parts of the building. Controls must be adjusted by the Control Manufacturer's mechanics on the advice of the balancing firm.

E. The final test report must include appropriate reference to all problems regarding the system(s) encountered prior to, during and after testing and what action should be taken to correct the problem(s), including noise and vibration.

F. The following work must be included by the balancing firm:
   1. Supervise the balancing of all water circulation systems and parts thereof installed under this section to obtain the water quantities and temperature drops in all parts of the system specified in the plans and in the specifications, or as required by the Commissioner.
   2. Supervise the balancing of the air conditioning and ventilating systems to achieve the air quantities specified at each air inlet, outlet and damper shown on the plans at the proper conditions of static pressure and temperature differential. Conduct all leakage tests on high (pressure) velocity ductwork in a manner acceptable to the Commissioner. Leakages must not exceed 3% of total air to be delivered.
   3. Enlist and provide cooperation of equipment manufacturer where needed to obtain proper equipment performance. Change motor or fan sheaves to field design capacity or most efficient operation conditions as required.
   4. Study and report on noise and vibration problems which may develop in the course of system balancing.
   5. Submit separate reports on the cooling and heating water circulating systems, ATC system, and heating and ventilating systems. These reports must certify test methods and instruments used, all readings obtained, temperature and pressure drops, RPM of equipment, amperage of all motors, air quantities at each outlet supply, return and air balancing problems encountered, and suggestions. Reports to be submitted to the City of New York must include data on all tests in the form normally used by AABC and NEEB. The reports must, however, be varied to suit these specifications. Reports must include fan and pump curves for the final speeds developed from the fan manufacturer's performance test data for all major equipment and schematics for all systems tested.
   6. Perform tests on heating systems when the outside temperature is averaging less than 30°F and on cooling systems when the outside temperature is above 80°F.
   7. Instruct the Building Maintenance employees for a minimum of two weeks during the adjusting and balancing period. Obtain signed statements form each employee verifying this instruction has been received by each.
   8. Carry out the "start-up" of the various systems with the Contractor and with any necessary assistance of the equipment manufacturer's representative.
   9. Furnish all instruments and provide all instrumentation required to perform the above work. The equipment and instrumentation will remain the property of the balancing subcontractor, however, all equipment must be first approved by the Commissioner before being used on the project.
   10. Assist the Commissioner and the Cx with Commissioning of the project.

3.5 INSTALLATION TOLERANCES

A. Air Handling Systems: Adjust to within plus or minus 5 percent of design.

B. Air Outlets and Inlets: Adjust total to within plus 5 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 5 percent of design.

C. Hydronic Systems: Adjust to within plus or minus 5 percent of design.

3.6 ADJUSTING

A. Verify recorded data represents actual measured or observed conditions.

B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

C. After adjustment, take measurements to verify balance has not been disrupted. If disrupted, verify correcting adjustments have been made.

D. Report defects and deficiencies noted during performance of services, preventing system balance.

E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

F. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Commissioner.

G. Prior to starting of balancing work, the Contractor must:
1. Adjust all balancing cocks and dampers open.
2. Fill, vent, and clean all water systems.
3. Place all equipment in operating condition.
4. Clean all strainers.
5. Remove all temporary air filters and install design filters.

H. For the duration of the balancing work, the Contractor must:
1. Maintain mechanics at project at all times for system operation, trouble shooting, assistance, etc.
2. Adjust fan drives or blade pitch or replace sheaves as required to meet system performance requirements.
3. Provide necessary mechanical adjustments in conjunction with balancing procedure.
4. Replace all balancing valves or dampers in systems that cannot be manipulated to satisfy balancing requirements.

I. Standard size (5" x 8") index cards, i.e., "check-out cards", must be enclosed in a Vinafilm binder securely attached to each device as per the above.

J. In cooperation with the Contractor, the TAB subcontractor must check and verify the satisfactory performance of static pressure of mass flow synchronization control loops and the ability of each control loop to hold a set-point and maintain stable fan or flow synchronization control. Operating tolerances for each loop set-point must be obtained from the ATC subcontractor.

K. Use flow meters where they are required for taking data. This must include the use of air flow metering stations for air flow measurement in preference to taking data via pitot-static tube traverses of ducts where such devices can be used. Where pitot-static tube traverses are performed, the TAB subcontractor must seal test holes with snap-in plugs or use approved caps made for this purpose. The use of tape to seal test holes will not be allowed.

L. Maintain specified acoustical performance of air systems; use dampering devices at air terminals to produce pressure drops not in excess of 0.15 in. w.g. for air balance trim.

M. With all boxes in the duct system set at maximum flow, the fan capacity output and static pressure capability must be determined by measurement and be recorded. Fan capacity deficiencies must be noted,

recorded and reported to the Commissioner for corrective action. Duct leakage estimates must also be noted and recorded and, if in excess of specified allowable, reported to the Commissioner for corrective action.

N. After satisfactory balance has been achieved, reset the duct system static pressure controller to the lowest set point compatible with scheduled air delivery.

O. Note and record any box controller limit setting by number where applicable.

P. If the supply and return air flow serving a particular zone are synchronized for system self-balancing purposes, confirm by measurements the capacity and action of the self-balancing control loop to track and maintain differential flow requirements. Instrument signal air supply pressures will be recorded where possible, depending upon the control loop's supplier.

Q. The aim of all balancing adjustments must be the minimum use of energy for fluid transport.

R. All fans should be set at their lowest rpm or blade pitch to provide design flow; air dampers are to be used only for final trim.

S. TAB subcontractor must verify accuracy and calibrate all measurement devices (flow sensors, pressure sensors, temperature devices, etc.) provided by Controls subcontractor.

3.7 AIR SYSTEM PROCEDURE

A. Adjust air handling and distribution systems to obtain required or design supply, return and exhaust air quantities at site altitude.

B. Make air quantity measurements in main ducts by Pitot tube traverse of entire cross sectional area of duct.

C. Measure air quantities at air inlets and outlets.

D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts.

E. Use volume control devices to regulate air quantities only to extent adjustments do not create objectionable air motion or sound levels. Effect volume control by using volume dampers located in ducts. The intent is to utilize minimum site energy and all fan systems should be properly setup to their lowest rpm to achieve design flow rates. Air dampers are to be used for final trim only.

F. Vary total system air quantities by adjustment of fan speeds. Provide sheave drive changes to vary fan speed. Vary branch air quantities by damper regulation.

G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across fan. Make allowances for 50 percent loading of filters.

I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.

J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.

K. At modulating damper locations, take measurements and balance at extreme conditions. Balance variable volume systems at maximum airflow rate, full cooling, and at minimum airflow rate, full heating.

L. Measure building static pressure and adjust supply, return, and exhaust air systems to obtain required relationship between each to maintain approximately 0.05 inches positive static pressure near building entries.

M. Check multi-zone units for motorized damper leakage. Adjust air quantities with mixing dampers set first for cooling, then heating, then modulating.

N. For variable air volume system powered units set volume controller to airflow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable-air-volume temperature control.

O. On fan powered VAV boxes, adjust airflow switches for proper operation.

P. Verify that leakage on terminal boxes is within the allowable rates, not to exceed 2 percent of design flow.

Q. For all air systems, testing must be done in all modes including minimum outside air mode and 100% economizer mode, etc.

3.8 WATER SYSTEM PROCEDURE

A. Adjust water systems, after air balancing, to obtain design quantities.

B. Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gauges to determine flow rates for system balance. Where flow-metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in system.

C. Adjust systems to obtain specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.

D. Effect system balance with automatic control valves fully open or in normal position to heat transfer elements.

E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.

F. Where available pump capacity is less than total flow requirements or individual system parts, simulate full flow in one part by temporary restriction of flow to other parts.

3.9 SCHEDULES

A. Equipment Requiring Testing, Adjusting and Balancing but not limited to the following:
   1. Condensing Units
   2. Air-Cooled Condensing Units
   3. Evaporative Cooler
   4. Air-Cooled Refrigerant Condensers

5. Unit Air Conditioners
6. Computer Room Air Conditioning Units
7. Air Coils
8. Evaporative Humidifier
9. Terminal Heat Transfer Units (Unit heaters, cabinet unit heaters)
10. Air Handling Units
11. Fans
12. Air Filters
13. Air Inlets and Outlets
14. Pressure Reducing Valves

B. Report Forms:
   1. Title Page:
      a. Name of Testing, Adjusting and Balancing Agency
      b. Address of Testing, Adjusting, and Balancing Agency
      c. Telephone and facsimile numbers of Testing, Adjusting and Balancing Agency
      d. Project name
      e. Project location
      f. Commissioner
      g. Project Contractor
      h. Project altitude
      i. Report date
   2. Summary Comments:
      a. Design versus final performance
      b. Notable characteristics of system
      c. Description of systems operation sequence
      d. Summary of outdoor and exhaust flows to indicate building pressurization
      e. Nomenclature used throughout report
      f. Test conditions
   3. Instrument List:
      a. Instrument
      b. Manufacturer
      c. Model number
      d. Serial number
      e. Range
      f. Calibration date
   4. Electric Motors:
      a. Manufacturer
      b. Model/Frame
      c. HP/BHP and kW
      d. Phase, voltage, amperage; nameplate, actual, no load
      e. RPM
      f. Service factor
      g. Starter size, rating, heater elements
      h. Sheave Make/Size/Bore
   5. V-Belt Drive:
      a. Identification/location
      b. Required driven RPM

c. Driven sheave, diameter and RPM
d. Belt, size and quantity
e. Motor sheave diameter and RPM
f. Center to center distance, maximum, minimum, and actual

6. Pump Data:
   a. Identification/number
   b. Manufacturer
   c. Size/model
   d. Impeller
   e. Service
   f. Design flow rate, pressure drop, BHP and kW
   g. Actual flow rate, pressure drop, BHP and kW
   h. Discharge pressure
   i. Suction pressure
   j. Total operating head pressure
   k. Shut off, discharge and suction pressures
   l. Shut off, total head pressure
7. Sound Level Report:
   a. Location
   b. Octave bands - equipment off
   c. Octave bands - equipment on
   d. RC level - equipment on
8. Vibration Test:
   a. Location of points:
      1) Fan bearing, drive end
      2) Fan bearing, opposite end
      3) Motor bearing, center (when applicable)
      4) Motor bearing, drive end
      5) Motor bearing, opposite end
      6) Casing (bottom or top)
      7) Casing (side)
      8) Duct after flexible connection (discharge)
      9) Duct after flexible connection (suction)
   b. Test readings:
      1) Horizontal, velocity and displacement
      2) Vertical, velocity and displacement
      3) Axial, velocity and displacement
   c. Normally acceptable readings, velocity and acceleration
   d. Unusual conditions at time of test
   e. Vibration source (when non-complying)

3.10 FINAL APPROVAL

A. The Contract must include an extended period of 120 days after submittal of the final certified test report (approved by the Commissioner) for a given system, during which time the Commissioner may request a spot check, retest and/or resetting of any outlet or other item as listed in the certified test report; however, this request may not exceed 10% of the outlets or devices on each central system.

B. If more than 5% of the total devices on a given central system test outside the prescribed limits set for air balance, the Commissioner will have the option of revoking the test report and requiring a complete rebalance of the system in question.

C. If a retest or spot check is requested, provide technicians and instruments in making any tests required during this period.

D. Final acceptance will not be accorded the certified test report until the extended period of 120 days has expired.

END OF SECTION 23 05 93

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SECTION 23 07 00 - HVAC INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. HVAC piping insulation, jackets and accessories.
   2. HVAC ductwork insulation, jackets, and accessories.

B. Related Sections:
   1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
   2. Section 09 90 00 - Painting and Coating: Execution requirements for painting insulation jackets and covering specified by this section.

1.3 REFERENCES

A. ASTM International:
   1. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
   2. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
   3. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement.
   4. ASTM C449/C449M - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement.
   5. ASTM C450 - Standard Practice for Prefabrication and Field Fabrication of Thermal Insulating Fitting Covers for NPS Piping, Vessel Lagging, and Dished Head Segments.
   6. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation.
   7. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
   8. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation.
   9. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
   10. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
   11. ASTM C585 - Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).
   12. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
   13. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
   14. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.

15. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
16. ASTM C1071 - Standard Specification for Thermal and Acoustical Insulation (Glass Fiber, Duct Lining Material).
17. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
18. ASTM C1290 - Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts.
19. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
20. ASTM D4637 - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane.
21. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
22. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
23. ASTM E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.
24. Con Edison Specification S-9021-6.

B. Sheet Metal and Air Conditioning Contractors:
   1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

C. National Fire Protection Association:
   1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

D. Underwriters Laboratories Inc.:
   1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
   2. UL 1978 - Standard for Safety for Grease Ducts.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.

C. Samples: Submit two (2) samples of representative size illustrating each insulation type.

D. Manufacturer's Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Test pipe insulation for maximum flame spread index of 25 and maximum smoke developed index of not exceeding 50 in accordance with ASTM E84, UL 723 and NFPA 258.

C. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.

D. Factory fabricated fitting covers manufactured in accordance with ASTM C450.

E. Perform Work in accordance with NYCBC.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Applicator: Company specializing in performing Work of this section with minimum three (3) years documented experience properly trained by manufacturer.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.8 DELIVERY, STORAGE AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

B. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.

B. Maintain temperature before, during, and after installation for minimum period of 24 hours.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturers for Glass Fiber and Mineral Fiber Insulation Products:
1. CertainTeed
2. Knauf
3. Johns Manville
4. Owens-Corning
5. Or approved equal

B. Manufacturers for Closed Cell Elastomeric Insulation Products:
   1. Aeroflex. Aerocell
   2. Armacell, LLC. Armaflex
   3. Nomaco. K-flex
   4. Or approved equal

C. Furnish materials in accordance with NYCBC.

2.2 PIPE INSULATION

A. TYPE P-1: ASTM C547, molded glass fiber pipe insulation.
   1. Thermal Conductivity: 0.23 at 75 degrees F.
   2. Operating Temperature Range: 0 to 850 degrees F.
   3. Vapor Barrier Jacket: ASTM C1136, Type I, factory applied reinforced foil kraft with self-sealing adhesive joints.
   4. Jacket Temperature Limit: minus 20 to 150 degrees F.
   5. Density 10 PCF average.

B. TYPE P-3: ASTM C612; semi-rigid, fibrous glass board noncombustible, end grain adhered to jacket.
   1. Thermal Conductivity: 0.27 at 75 degrees F.
   2. Operating Temperature Range: 0 to 650 degrees F.
   3. Vapor Barrier Jacket: ASTM C1136, Type II, factory applied reinforced foil kraft with self-sealing adhesive joints.
   4. Jacket Temperature Limit: minus 20 to 150 degrees F.
   5. Density 10 PCF average.

C. TYPE P-4: ASTM C612; semi-rigid, fibrous glass board noncombustible.
   1. Thermal Conductivity: 0.27 at 75 degrees F.
   2. Operating Temperature Range: 0 to 650 degrees F.
   3. Density 10 PCF average.

D. TYPE P-5: ASTM C534, Type I, flexible, closed cell elastomeric insulation, tubular.
   1. Thermal Conductivity: 0.27 at 75 degrees F.
   2. Operating Temperature Range: Range: Minus 70 to 180 degrees F.

E. TYPE P-6: ASTM C534, Type I, flexible, closed cell elastomeric insulation, tubular.
   1. Thermal Conductivity: 0.30 at 75 degrees F.
   2. Maximum Service Temperature: 300 degrees F.
   3. Operating Temperature Range: Range: Minus 58 to 300 degrees F.

F. TYPE P-7: ASTM C534, Type I, flexible, nonhalogen, closed cell elastomeric insulation, tubular.
   1. Thermal Conductivity: 0.27 at 75 degrees F.
   2. Maximum Service Temperature: 250 degrees F.
   3. Operating Temperature Range: Range: Minus 58 to 250 degrees F.

G. TYPE P-8: ASTM C547, Type I rigid, mineral fiber preformed pipe insulation, non-combustible.
   1. Thermal Conductivity: 0.23 at 75 degrees F.
   2. Maximum Service Temperature: 1200 degrees F.

3. Reinforced Fail Vapor Retarding Jacket: UL listed and treated with fire retardant lagging adhesive. ASTM E93.
4. Consisting of single layer thickness to comply with requirement.

2.3 PIPE INSULATION JACKETS

A. PVC Plastic Pipe Jacket:
1. Product Description: ASTM D1784, One piece molded type fitting covers and sheet material, off-white color.
2. Thickness: 10 mil.
3. Connections: Pressure sensitive color matching vinyl tape.

B. Aluminum Pipe Jacket:
1. ASTM B209.
2. Thickness: 0.016 inch thick sheet.
3. Finish: Smooth.
4. Joining: Longitudinal slip joints and 2 inch laps.
5. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.
6. Metal Jacket Bands: 3 inches wide; 1/8 inch thick aluminum.

C. Field Applied Glass Fiber Fabric Jacket System:
1. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.
2. Glass Fiber Fabric:
   a. Cloth: Untreated; 9 oz/sq yd weight.
   b. Blanket: 1.0 lb/cu ft density.
   c. Weave: 5 x 5.
3. Indoor Vapor Retarder Finish:
   a. Cloth: Untreated; 9 oz/sq yd weight.
   b. Vinyl emulsion type acrylic, compatible with insulation, white color.

2.4 PIPE INSULATION ACCESSORIES

A. Vapor Retarder Lap Adhesive: Compatible with insulation.

B. Covering Adhesive Mastic: Compatible with insulation.

C. Piping 1-1/2 inches diameter and smaller: Galvanized steel insulation protection shield. MSS SP-69, Type 40. Length: Based on pipe size and insulation thickness.

D. Piping 2 inches diameter and larger: Steel saddle. Inserts length: not less than 6 inches long, matching thickness and contour of adjoining insulation.

E. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12-inch centers.

F. Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement: ASTM C449/C449M.

G. Insulating Cement: ASTM C195; hydraulic setting on mineral wool.

H. Adhesives: Compatible with insulation.

2.5 EQUIPMENT INSULATION

A. TYPE E-2: ASTM C612; glass fiber, rigid board, noncombustible with factory applied reinforced aluminum foil jacket.
   1. Thermal Conductivity: 0.24 at 75 degrees F.
   2. Operating Temperature Range: 0 to 450 degrees F.
   3. Density: 3.0 pound per cubic foot.
   4. Jacket Temperature Limit: minus 20 to 150 degrees F.

B. TYPE E-5: ASTM C612; glass fiber, semi-rigid board, noncombustible.
   1. Thermal Conductivity: 0.23 at 75 degrees F.
   2. Maximum Operating Temperature: 850 degrees F.
   3. Density: 3.0 pound per cubic foot.

C. TYPE E-7: ASTM C612-93; Type V, thermafiber board, asbestos free.
   1. Thermal Conductivity: 0.46 at 400 degrees F.
   2. Maximum Operating Temperature Range: 1900 degrees F.
   3. Density: 18.5 PCF

D. TYPE E-8: ASTM C534, Type II, flexible, closed cell elastomeric insulation, sheet.
   1. Thermal Conductivity: 0.27 at 75 degrees F.
   2. Operating Temperature Range: Range: Minus 70 to 220 degrees F.

2.6 DUCTWORK INSULATION

A. TYPE D-1: ASTM C1290, Type III, flexible glass fiber, commercial grade with factory applied reinforced aluminum foil jacket meeting ASTM C1136, Type II.
   1. Thermal Conductivity: 0.25 at 75 degrees F.
   2. Maximum Operating Temperature: 250 degrees F.
   3. Density: 1.5 pound per cubic foot.

B. TYPE D-2: ASTM C612, Type IA or IB, rigid glass fiber, with factory applied all service facing meeting ASTM C1136, Type II.
   1. Thermal Conductivity: 0.22 at 75 degrees F.
   2. Density: 4.25 pound per cubic foot.

C. TYPE D-4: ASTM C1071, Type I, flexible, glass fiber duct liner with coated air side.
   1. Thermal Conductivity: 0.24 at 75 degrees F.
   2. Density: 1.5 pound per cubic foot.
   3. Maximum Operating Temperature: 250 degrees F.
   4. Maximum Air Velocity: 2,000 feet per minute.
   5. 1 inch minimum.
   6. Treated with EPA register anti-microbial agent proven to resist microbial growth as determined by ASTM G-21 and G-22.

2.7 DUCTWORK INSULATION JACKETS

A. Outdoor Duct Jacket: Flexible Self-Adhering Weatherproof System:
   1. Product: Subject to compliance with requirements, provide one of the following:
      a. Flex Clad 250
      b. Polyguard
      c. Venture Clad
      d. Or approved equal

B. Membrane Duct Jacket: ASTM D4637; Type I, EPDM; non-reinforced, 0.060 inch thick, 48-inch-wide roll; white color.

2.8 DUCTWORK INSULATION ACCESSORIES

A. Vapor Retarder Tape:
   1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber-based adhesive.

B. Vapor Retarder Lap Adhesive: Compatible with insulation.

C. Adhesive: Waterproof, ASTM E162 fire-retardant type.

D. Liner Fasteners: Galvanized steel, welded with integral head.

E. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12-inch centers.

F. Lagging Adhesive: Fire resistive to ASTM E84, NFPA 255 and UL 723.

G. Impale Anchors: Galvanized steel, 12 gage self-adhesive pad.

H. Adhesives: Compatible with insulation.

I. Membrane Adhesives: As recommended by membrane manufacturer.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify piping, equipment and ductwork have been tested before applying insulation materials.

B. Verify surfaces are clean and dry, with foreign material removed.

3.3 INSTALLATION - PIPING SYSTEMS

A. Piping Exposed to View in Finished Spaces: Locate insulation and cover seams in least visible locations.

B. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to Section 07 84 00 for penetrations of assemblies with fire resistance rating greater than one hour.

C. Piping Systems Conveying Fluids Below Ambient Temperature:
1. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump and expansion joints.
2. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips. Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.
3. Insulate fittings, joints, valves and all appurtenances with molded insulation of like material and thickness as adjacent pipe. Finish with PVC fitting covers.

D. Glass Fiber Board Insulation:
1. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
2. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.
3. Cover wire mesh or bands with cement to a thickness to remove surface irregularities.

E. Hot Piping Systems less than 140 degrees F. and greater than 140 degrees F:
1. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
2. Insulate fittings, joints, valves and all appurtenances with molded insulation of like material and thickness as adjoining pipe. Finish with PVC fitting covers.
3. Insulate unions and flanges.

F. Inserts and Shields:
1. Piping 1-1/2 inches Diameter and Smaller: Install galvanized steel shield between pipe hanger and insulation.
2. Piping 2 inches Diameter and Larger: Install saddle between support shield and piping and under finish jacket.
    a. Insert Configuration: Minimum 6 inches long, of thickness and contour matching adjoining insulation; may be factory fabricated.
    b. Insert Material: Compression resistant insulating material suitable for planned temperature range and service.
3. Piping Supported by Roller Type Pipe Hangers: Install galvanized steel shield between roller and inserts.
4. Inserts between the pipe and pipe hangers must consist of rigid pipe insulation of equal thickness to the adjoining insulation and must be provided with vapor barrier where required. Insulation inserts must be not less than following lengths:
    a. 2-1/2 in. pipe size and smaller: 6 in. long

b. 3 in. to 6 in. pipe size: 9 in. long
c. 8 in. to 10 in. pipe size: 12 in. long
d. larger than 10 in. pipe size: 18 in. long

G. Insulation Terminating Points:
1. Ducted Coil Branch Piping: Terminate hot water piping at the coil connections including coil header.
2. Chilled Water Coil Branch Piping: Insulate chilled water piping and associated components up to coil connection.
3. Condensate Piping: Insulate entire piping system and components to prevent condensation.

H. Closed Cell Elastomeric Insulation:
1. Push insulation on to piping.
2. Miter joints at elbows.
3. Seal seams and butt joints with manufacturer's recommended adhesive.
4. When application requires multiple layers, apply with joints staggered.
5. Insulate fittings and valves with insulation of like material and thickness as adjacent pipe.

I. High Temperature Pipe Insulation:
1. Install single layer to meet thickness scheduled. Multiple layers of insulation will not be accepted.
2. All insulation surfaces not in shaft construction must maintain a maximum of 100°F for piping insulation and 130°F for equipment insulation.
3. Stagger joints between jackets.
4. Supplied with pre-formed jacket.

J. Piping Exterior to Building: Provide vapor retarder jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor retarder cement. Cover with aluminum jacket with seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal piping.

K. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces: Aluminum jacket and fitting covers.

L. Prepare pipe insulation for finish painting. Refer to Section 09 90 00.

M. Insulation at Strainers: Provide removable insulation.

3.4 INSTALLATION - EQUIPMENT

A. Factory Insulated Equipment: Do not insulate.

B. Exposed Equipment: Locate insulation and cover seams in least visible locations.

C. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.

D. Equipment Containing Fluids Below Ambient Temperature:
1. Insulate entire equipment surfaces.
2. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.

3. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips. Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.
4. Finish insulation at supports, protrusions, and interruptions.

E. Equipment Containing Fluids 140ºF or less and over 140ºF:
1. Insulate flanges and unions with removable sections and jackets.
2. Install insulation with factory-applied or field applied jackets, with vapor barrier. Finish with glass cloth and adhesive.
3. Finish insulation at supports, protrusions, and interruptions.

F. Equipment in Mechanical Equipment Rooms or Finished Spaces: Finish with aluminum jacket.

G. Equipment Located Exterior to Building: Install vapor barrier jacket or finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal equipment.

H. Cover glass fiber, cellular glass, hydrous calcium silicate insulation with metal mesh and finish with heavy coat of insulating cement and aluminum jacket.

I. Nameplates and ASME Stamps: Bevel and seal insulation around; do not cover with insulation.

J. Equipment Requiring Access for Maintenance, Repair or Cleaning: Install insulation for easy removal and replacement without damage.

K. Prepare equipment insulation for finish painting. Refer to Section 09 90 00.

3.5 INSTALLATION - DUCTWORK SYSTEMS

A. Duct dimensions indicated on Drawings are finished inside dimensions.

B. Insulated ductwork conveying air below ambient temperature:
1. Provide insulation with vapor retarder jackets.
2. Finish with tape and vapor retarder jacket.
3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections and expansion joints.

C. Insulated ductwork conveying air above ambient temperature:
1. Provide with or without standard vapor retarder jacket.
2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.

D. Ductwork Exposed in Mechanical Equipment Rooms or Finished Spaces (below 10 feet above finished floor): Finish with aluminum jacket.

E. External Glass Fiber Duct Insulation:
1. Secure insulation with vapor retarder jacket with wires and seal jacket joints with vapor retarder adhesive or tape to match jacket.
2. Secure insulation without vapor retarder jacket with staples, tape, or wires.

3. Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift ductwork off trapeze hangers and insert spacers.
4. Seal vapor retarder penetrations by mechanical fasteners with vapor retarder adhesive.
5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

F. Duct and Plenum Liner:
1. Adhere insulation with adhesive for 100 percent coverage.
2. Secure insulation with mechanical liner fasteners. Comply with SMACNA Standards for spacing.
3. Seal and smooth joints. Seal and coat transverse joints.
4. Seal liner surface penetrations with adhesive.
5. Cut insulation for tight overlapped corner joints. Support top pieces of liner at edges with side pieces.
6. Provide metal nosings at section joints.

G. Ducts Exterior to Building:
1. Install insulation according to external duct insulation paragraph above.
2. Provide external insulation with vapor retarder jacket. Cover with outdoor jacket finished as specified in this Section.
3. Finish with membrane duct jacket.
4. Calk seams at flanges and joints. Located major longitudinal seams on bottom side of horizontal duct sections.

H. Prepare duct insulation for finish painting. Refer to Section 09 90 00.

3.6 SCHEDULES

A. Cooling Services Piping Insulation Schedule:

PIPING SYSTEM	INSULATION TYPE	PIPE SIZE	INSULATION THICKNESS inches
Chilled Water Supply and Return 40 to 60 degrees F	P-1	All	1.5
Condensate Piping from Cooling Coils	P-5	All sizes	0.75
Refrigerant	P-5	All	1.5

B. Heating Services Piping Insulation Schedule:

PIPING SYSTEM	INSULATION TYPE	PIPE SIZE	INSULATION THICKNESS inches
Low Pressure Steam Supply and condensate return up to 15 psi up to 250 degrees F	P-1 P-3	1-1/2 inches and smaller 2 inches and up	1.5 3.0
Drain Piping	P-1	All sizes	1

C. Ductwork Insulation Schedule:

DUCTWORK SYSTEM	INSULATION TYPE	INSULATION THICKNESS inches
Outside Air Intake	D-2	2
Equipment Casings	D-2	2
Supply Ducts (internally insulated) in MER's or as specified	D-4	1.5
Return Ducts (internally insulated) in MER's or as specified	D-4	1.5
Supply Ducts located above hung ceilings that are not internally insulated	D-1	1.5
Return Ducts located above hung ceilings or in shaft	D-1	1.5
Supply ducts in MER's and exposed to view	D-2	1.5
Spill/exhaust ducts from louver to motorized damper	D-2	1.5
Exterior to building on roof	D-2	2.0
Exhaust Ducts Within 10 feet of Exterior Openings (Thickness indicated is installed thickness.)	D-2	1.5
Exhaust Ducts Exposed to Outdoor Air	D-2	2.0
Rectangular Supply Ducts Downstream of Variable Air Volume Boxes (internally insulated)	D-4	1.5
Rectangular and Round Supply Ducts Downstream of Variable Air Volume Boxes (externally insulated)	D-1	1.0
Round Supply Ducts Downstream of Variable Air Volume Boxes (externally insulated)	D-1	1.0

1. Refer to Section 23 05 48 "Noise and Vibration Controls for HVAC Piping and Equipment" for specific applications of internally insulated ducts.

END OF SECTION 23 07 00

SECTION 23 08 00 - COMMISSIONING OF MECHANICAL 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. Commissioning process requirements for HVAC&R systems, assemblies and equipment.

B. Related Sections:
   1. DDC General Conditions Section 01 91 13 “General Commissioning Requirements for MEP Systems” for general commissioning process requirements.

1.3 DESCRIPTION

A. Commissioning is a systematic process of confirming that all building systems perform interactively according to the Owner’s Project Requirements and the Basis of Design and continuing through construction, acceptance and the warranty period with actual verification of performance.

B. The Commissioning process does not take away from or reduce the responsibility of the Contractor to provide a finished and fully functioning product.

C. The CxA directs and coordinates the commissioning activities and reports to the Commissioner. All members in the construction process work together to fulfill their contracted responsibilities and meet the objectives of the Owner’s Project Requirement’s as detailed in the Contract Documents.

1.4 DEFINITIONS

A. Refer to DDC General Conditions for definitions.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. The CxA will review and approve submittals related to the commissioned equipment for conformance to the Contract as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The CxA will notify the Contractor, or Commissioner as requested, of items missing or areas that are not in conformance with Contract and which require resubmission.

C. The CxA will receive a copy of the final approved submittals.

D. In addition, the Contractor is to provide the following:
   1. Certificate of readiness
   2. Certificates of completion of installation, prestart, and startup activities.
   3. O&M manuals
   4. Test reports

E. Refer to DDC General Conditions for general commissioning submittal requirements.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Test Equipment Calibration Requirements: The Contractor will comply with test manufacturer’s calibration procedures and intervals. Recalibrate test instruments immediately after instruments have been repaired resulting from being dropped or damaged. Affix calibration tags to test instruments. Furnish calibration records to CxA upon request.

1.7 COORDINATION

A. Commissioning Kick-Off Meeting – Construction Team: The Contractor will attend a meeting of the Commissioning Team, chaired by the CxA, to review the scope of commissioning process activities and the Commissioning Plan with discussions on milestones, activities, and assignments of responsibilities. The flow and type of documents and the amount of submittal data given to the CxA will be determined. Meeting minutes will then be distributed to all parties by the CxA.

B. Commissioning Meetings: The Contractor will attend coordination meetings with the Commissioning Team, chaired by the CxA, to review progress on the Commissioning Plan, construction deficiencies, scheduling conflicts, and to discuss strategies and processes for upcoming commissioning process activities.

C. Miscellaneous Construction Meetings: The CxA attends selected planning and job-site meetings in order to remain informed on construction progress and to update parties involved in the commissioning process. This will not include 100% meeting attendance, but the CxA shall be provided with the subsequent meeting minutes for review.

D. Pre-testing Meetings: The Contractor will attend pretest meetings with the Commissioning Team, chaired by the CxA, to review startup reports, pre-test inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers’ authorized service representative services for each system, subsystem, equipment, and component to be tested.

E. Testing: The Contractor will coordinate with testing personnel and agencies for timing and access for CxA to witness test.

F. Manufacturers’ Inspection and Startup Services: The Contractor will coordinate services of manufacturers’ inspection and startup services.

G. Testing, Adjusting and Balancing: The Contractor will coordinate with plan and schedule for testing, adjusting and balancing for timing and access for CxA to witness process.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

A. All standard testing equipment required to perform startup, initial checkout and functional performance testing shall be provided by the Contractor for the equipment being tested. For example, the Contractor shall ultimately be responsible for all standard testing equipment for the HVAC&R system and controls system in Division 23. A sufficient quantity of two-way radios shall be provided by the Contractor.

B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed. Proprietary test equipment (and software) shall become the property of the City of New York's personnel upon completion of the commissioning process.

C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL DOCUMENTATION REQUIREMENTS

A. With assistance from the Contractor, the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems. These checklists shall be provided to the Contractor for completion. The CxA shall gather and review the completeness and accuracy of these checklists via site visits

B. Red-lined Drawings (As-Builts): Contractor will verify all equipment, systems, instrumentation, wiring and components are shown correctly on red-lined drawings. Preliminary, red-lined drawings must be made available to the Commissioning Team for use prior to the start of Functional Performance Testing. Changes, as a result of Functional Testing, must be incorporated into the final as-built drawings, which will be created from the red-lined drawings. The Contractor will create the as-built drawings.

C. Operation and Maintenance Data: Contractor will provide a copy of O&M literature within 45 days of each submittal acceptance for use during the commissioning process for all commissioned equipment and systems. The CxA will review the O&M literature once for conformance to project requirements. The CxA will receive a copy of the final approved O&M literature once corrections have been made by the Contractor.

D. Demonstration and Orientation: Contractor will provide demonstration and orientation as required by the specifications. A complete orientation plan and schedule must be submitted by the Contractor to the CxA four weeks (4) prior to any orientation. An orientation agenda for each orientation session must be submitted to the CxA one (1) week prior the orientation session.

3.3 CONTRACTOR'S RESPONSIBILITIES

A. Refer to the DDC General Conditions Section 01 91 13 “General Commissioning Requirements for MEP systems” for Contractor’s responsibilities

B. The Contractor will attend construction phase controls coordination meetings and ensure that the HVAC and controls subcontractors attend.

C. The Contactor will attend testing, adjusting, and balancing review and coordination meetings and ensure that the HVAC and balancing subcontractors attend.

D. Provide information requested by the CxA for final commissioning documentation.

E. Prepare preliminary schedule for mechanical system orientations and inspections, operation and maintenance manual submissions, orientation sessions, pipe and duct system testing, flushing and cleaning, equipment start-up, testing and balancing and task completion for the City of New York. Distribute preliminary schedule to commissioning team members at the beginning of the construction phase.

F. Provide measuring instruments and logging devices to record test data and provide data acquisition equipment to record data for the complete range of testing for the required test period.

G. Provide detailed startup procedures.

H. Provide a written list of all user adjustable set-points and reset schedules with a brief discussion of the purpose of each and the range of reasonable adjustments with energy implications.

I. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.

J. Respond to provided new deficiencies and/or responses within five (5) business days.

K. Gather operation and maintenance literature on all equipment, and assemble in binders as required by the Contract Documents. Submit to CxA 45 days after submittal acceptance.

L. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.

M. Notify the CxA a minimum of two weeks in advance of the time for start of the testing and balancing work. Attend the initial testing and balancing meeting for review of the official testing and balancing procedures.

N. Provide written notification to the Commissioner and CxA that the following work has been completed in accordance with the contract documents, and that the equipment, systems, and sub-system are operating as required.

1. HVAC&R equipment including all fans, air handling units, ductwork, dampers, terminals, and all other equipment furnished under this Division.

O. The equipment supplier shall document the performance of his equipment.

P. Provide a complete set of red-lined drawings to the CxA prior to the start of Functional Performance Testing.

Q. Test, Adjust and Balance subcontractor, under the direction of the Contractor:
1. Attend initial commissioning coordination meeting scheduled by the CxA.
2. Submit the site-specific testing and balancing plan to the CxA and Commissioner for review and acceptance.
3. Attend the testing and balancing review meeting scheduled by the CxA. Be prepared to discuss the procedures that shall be followed in testing, adjusting, and balancing the HVAC&R system.
4. At the completion of the testing and balancing work, and the submittal of the final testing and balancing report, notify the HVAC&R subcontractor and the Contractor.
5. Participate in verification of the testing and balancing report, which will consist of repeating measurements contained in the testing and balancing reports. Assist in diagnostic purposes when directed.
6. Provided recommended setpoints as determined by testing, adjusting, and balancing, such as static pressure and differential pressure setpoints.

R. Contractor responsibilities to be completed by Equipment Suppliers:
1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the City of New York's personnel, to keep warranties in force.
2. Assist in equipment testing.
3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

3.4 CxA'S RESPONSIBILITIES

A. Roles and Responsibilities
1. Refer to the DDC General Conditions section 01 91 13 "General Commissioning Requirements for MEP Systems" for CxA responsibilities.

3.5 TESTING PREPARATION

A. Certify in writing to the CxA that HVAC&R systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.

B. Certify in writing to the CxA that HVAC&R instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.

C. Certify in writing that testing, adjusting, and balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.

D. Place systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).

E. Inspect and verify the position of each device and interlock identified on checklists.

F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.

G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

3.6 TESTING, ADJUSTING AND BALANCING VERIFICATION

A. Prior to performance of Testing, Adjusting, and Balancing work, provide copies of reports, sample forms, checklists, and certificates to the CxA.

B. Notify the CxA at least ten (10) days in advance of testing and balancing Work and provide access for the CxA to witness testing and balancing Work.

C. Provide technicians, instrumentation, and tools to verify testing and balancing of HVAC&R systems at the direction of the CxA.
   1. The CxA will notify the Contractor ten (10) days in advance of the date of field verification. Notice will not include data points to be verified.
   2. The Contractor will ensure that the testing and balancing subcontractor shall use the same instruments (by model and serial number) that were used when original data were collected.
   3. Failure of an item includes, other than sound, a deviation of more than 10 percent. Failure of more than 10 percent of selected items shall result in rejection of final testing, adjusting, and balancing report. For sound pressure readings, a deviation of 3 dB shall result in rejection of final testing. Variations in background noise must be considered.
   4. Remedy the deficiency and notify the CxA so verification of failed portions can be performed.

3.7 GENERAL TESTING REQUIREMENTS

A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.

B. Scope of HVAC&R testing shall include entire HVAC&R installation, from central equipment for heat generation and refrigeration through distribution systems to each conditioned space. Testing shall include measuring capacities and effectiveness of operational and control functions.

C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.

D. The CxA along with the Contractor, who will ensure that the HVAC&R subcontractor, testing and balancing subcontractor, and HVAC&R Instrumentation and Control subcontractor participate, shall prepare detailed testing plans, procedures, and checklists for HVAC&R systems, subsystems, and equipment.

E. Tests will be performed using design conditions whenever possible.

F. Simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by the CxA and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.

G. The CxA may direct that set points be altered when simulating conditions is not practical.

H. The CxA may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are not practical.

I. If tests cannot be completed because of a deficiency outside the scope of the HVAC&R system, document the deficiency and report it to the Commissioner. After deficiencies are resolved, reschedule tests.

J. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

3.8 HVAC&R SYSTEMS, SUBSYSTEMS AND EQUIPMENT TESTING PROCEDURES

A. Equipment Testing and Acceptance Procedures: Testing requirements are specified in individual Division 23 sections. Provide submittals, test data, inspector record, and certifications to the CxA.

B. HVAC&R Instrumentation and Control System Testing: Field testing plans and testing requirements are specified in Division 23 Sections "Direct-Digital Control System for HVAC" and "Sequence of Operations for HVAC Controls." Assist the CxA with preparation of testing plans.

C. Refrigeration System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of refrigerant compressors and condensers, heat pumps, and other refrigeration systems. The CxA shall determine the sequence of testing and testing procedures for each equipment item and pipe section to be tested.

D. HVAC&R Distribution System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of air, steam, and hydronic distribution systems; special exhaust; and other distribution systems, including HVAC&R terminal equipment and unitary equipment.

E. Vibration and Sound Tests: Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.

F. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. The following equipment and systems shall be evaluated:
   1. Split System A/C Units
   2. Heat Recovery Units (indoor & outdoor)
   3. Condensate Pumps
   4. Branch Circuit Controllers
   5. Exhaust / Return Fans
   6. Energy Recovery Ventilator
   7. Rooftop Units

3.9 DEFICIENCIES/NON-CONFORMANCE, FAILURE DUE TO MANUFACTURER DEFECT

A. Deficiencies/Non-Conformance:
   1. The CxA will record the results of the functional test on the test form. All deficiencies or non-conformance items shall be noted and reported to the Commissioner and the Contractor on a standardized form.
   2. The Contractor shall respond to new deficiencies within five (5) business days. The response shall either indicate the issue will be corrected with anticipated date of completion indicated or the response should clearly indicate why the Contractor disputes the claim while referencing the Contract Documents in dispute or request further information to clarify the concern.
   3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA.
   4. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.
   5. As tests progress and a deficiency is identified, the CxA discusses the issue with the Contractor.
   6. When there is no dispute on the deficiency and the Contractor accepts responsibility to correct it, the CxA documents the deficiency and the Contractor's response and intentions or corrections. The CxA and Contractor then proceed to another test or sequence. Once the Contractor corrects the deficiency, the test is rescheduled and repeated in the anticipation of correct operation or function.
   7. When there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible, the CxA documents the deficiency and the Contractor's response. The deficiency is then forwarded to parties assumed to be responsible for the deficiency. Resolutions are made at the lowest management level possible. Other parties are brought into the discussion as needed. Final interpretive authority is with the Commissioner. Final acceptance authority is with the Commissioner and CxA. The CxA will then document the resolution process. Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency. The CxA then reschedules the test as stated in the section above.
   8. Deficiencies that are not corrected at the time of documentation, shall be completed by the affected Contractor and photo evidence of the deficiency resolution shall be sent to both the Commissioner and the CxA.

B. Failure due to Manufacturer Defect:
   1. If 10% or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the CxA and the Commissioner. In such case, the Contractor shall provide the Commissioner with the following:
      a. Within one week of notification from the Contractor the manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the Commissioner within two weeks of the original notice.
      b. Within two weeks of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
      c. Commissioner will determine whether a replacement of all identical units or a repair is acceptable.

d. Two examples of the proposed solution will be installed by the Contractor and the Contractor will be allowed to test the installations for up to one week, upon which the Commissioner will decide whether to accept the solution.
e. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

3.10 APPROVAL

A. The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA. The CxA recommends acceptance of each test to the Commissioner using a standard form.

3.11 SEASONAL TESTING

A. Seasonal Testing – During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the Contractor, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and record documents due to seasonal testing will be made by the Contractor.

3.12 OPERATION AND MAINTENANCE MANUALS

A. The Operation and Maintenance Manuals shall conform to Contract requirements as stated in the DDC General Conditions Sections 01 78 39 "Contract Record Documents" and 01 91 13 "General Commissioning Requirements for MEP Systems."

B. The specific content and format requirements for the standard O&M manuals are detailed in the DDC General Conditions 01 78 39 "Contract Record Documents" and 01 91 13 "General Commissioning Requirements for MEP Systems." Special requirements for the controls subcontractor and TAB subcontractor are found in Division 23.

C. CxA Review and Approval – Prior to substantial completion, the CxA shall review the O&M manuals, documentation and record documents for systems that were commissioned to verify compliance with the Specifications. The CxA will communicate deficiencies in the manuals to the Contractor, or Commissioner, as requested. Upon a successful review of the corrections, the CxA recommends approval and acceptance of these sections of the O&M manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

3.13 INSTRUCTION OF THE CITY OF NEW YORK PERSONNEL

A. The Contractor shall be responsible for instruction coordination, scheduling, and ultimately for ensuring that instruction is completed.

B. The CxA shall oversee the instruction of the City of New York's personnel for commissioned equipment and systems.

1. The CxA shall interview the City of New York's personnel to determine the special needs and areas where instruction will be most valuable. The Commissioner and CxA shall decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA shall communicate the results to the Contractor who will ensure participation by the subcontractors.
2. In addition to these general requirements, the specific instruction requirements of the City of New York's personnel by the Contractor are specified in the DDC's General Conditions Section 01 79 00 "Demonstration and Owners' Pre-Acceptance Orientation."
3. The Contractor shall ensure that each subcontractor and vendor responsible for instruction will submit a written instruction plan to the Contractor for review and approval prior to instruction. The Contractor will submit one comprehensive instruction plan to the CxA and the Commissioner.
4. The plan will be reviewed by the CxA and the Commissioner. Comments pertaining to its deficiencies will be forwarded to the Contractor. The instruction plan will be rewritten until approved by the CxA and the Commissioner. The final approved instruction plan will cover the following elements:
    a. Equipment (included in instruction)
    b. Intended audience
    c. Location of instruction
    d. Objectives
    e. Subjects covered (description, duration of discussion, special methods, etc.)
    f. Duration of instruction on each subject
    g. Qualified instructor for each subject
    h. Instructor qualifications
    i. Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)
5. For the primary HVAC equipment, the Contractor shall ensure that the controls subcontractor provide a discussion of the control of the equipment during the mechanical or electrical instruction conducted by each subcontractor or vendor.
6. Instruction documentation shall include the following items:
    a. Copy of the instruction plan, including schedule, syllabus, and agenda.
    b. Copy of the Owner's Project Requirements.
    c. Copy of the Basis of Design.
    d. Compiled operations manuals.
    e. Compiled maintenance manuals.
    f. Completed manufacturer instruction manuals.
    g. Red-lined drawings.
7. The CxA develops criteria for determining that the instruction was satisfactorily completed, including attending the instruction, etc. The CxA recommends approval of the instruction to the Commissioner using a standard form. The Commissioner signs the approval form/letter template.
8. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment.
9. Video recording of the instruction sessions will be verified by the CxA in electrical format, at the discretion of the Commissioner.

END OF SECTION 23 08 00

SECTION 23 09 23 - DIRECT DIGITAL CONTROL SYSTEM 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 control equipment and software.

B. Related Sections:
   1. Section 23 09 93 - Sequence of Operations for HVAC Controls: Sequences of operation implemented using products specified in this section.
   2. Division 26 - Wiring Connections: Execution requirements for electric connections specified by this section.

1.3 REFERENCES

A. American National Standards Institute:
   1. ANSI MC85.1 - Terminology for Automatic Control.
   2. ANSI/ASHRAE Standard 135 - BACNET - A Data Communication Protocol for Building Automation and Control Networks.

1.4 SYSTEM DESCRIPTION

A. Automatic temperature controls field monitoring and control system using field programmable microprocessor-based units with communications to Building Automation and Control System.

B. Base system on distributed system of fully intelligent, stand-alone controllers, operating in a multi-tasking, multi-user environment on token passing network, with central and remote hardware, software, and interconnecting wire and conduit.

C. Provide computer software and hardware, operator input/output devices, control units, local area networks (LAN), sensors, control devices and actuators.

D. Provide controls for variable air volume terminals, radiation, reheat coils, unit heaters, fan coils, and when directly connected to control units.

E. Provide control systems consisting of thermostats, control valves, dampers and operators, indicating devices, interface equipment and other apparatus and accessories to operate mechanical systems, and to perform functions specified.

F. Provide installation and calibration, supervision, adjustments, and fine tuning necessary for complete and fully operational system.

G. The entire system must be UL 864 listed for smoke control operation and meet all NYCBC requirements for smoke exhaust.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate the following:
1. Trunk cable schematic showing programmable control-unit locations and trunk data conductors.
2. System schematics, including:
   a. Sequence of operations.
3. System riser diagrams.
4. Connected data points, including connected control unit and input device.
5. System graphics showing monitored systems, data connected and calculated point addresses, and operator notations. Submit demonstration diskette containing graphics.
6. System configuration with peripheral devices, batteries, power supplies, diagrams, modems, and interconnections.
7. Description and sequence of operation for operating, user, and application software.
8. Use terminology in submittals conforming to ASME MC85.1.
9. Coordinate submittals with information requested in Section 23 09 93.
10. Submit BACNET system architecture drawings and BACNET compliant devices.

C. Product Data: Submit data for each system component and software module.

D. Manufacturer's Installation Instructions: Submit installation instruction for each control system component.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of control components, including control units, thermostats, and sensors.
1. Revise shop drawings to reflect actual installation and operating sequences.
2. Submit data specified in "Submittals" in final "Record Documents" form.

B. Operation and Maintenance Data:
1. Submit interconnection wiring diagrams complete field installed systems with identified and numbered system components and devices.
2. Submit keyboard illustrations and step-by-step procedures indexed for each operator function.
3. Submit inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. The BAS system must be designed and installed, commissioned and serviced by manufacturer employed, factory-trained personnel. Manufacturer must have an in-place support facility within proximity of the site with technical staff, spare parts inventory and necessary test and diagnostic equipment.
   1. The manufacturer must provide an on-site, experienced project manager for this work, responsible for direct supervision of the design, installation, start up and commissioning of the Building Automation System (BAS).
   2. The Contractor must be regularly engaged in the manufacturing, installation and maintenance of BAS systems and must have a minimum of three (3) years of demonstrated technical expertise and experience in the installation and maintenance of BAS systems similar in size and complexity to this project. A maintained service organization consisting of competent servicemen is required.

C. Materials and equipment must be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and must be manufacturer's latest standard design that complies with the specification requirements.

D. All BAS peer-to-peer network controllers, central system controllers and local user displays must be UL Listed under Standard UL 916, category PAZX; Standard ULC C100, category UUKL7; and under Standard UL 864, categories UUKL, UDTZ, and QVAX, and be so listed at the time of bid. All floor level controllers must comply, at a minimum, with UL Standard UL 91 6category PAZX; Standard UL 864, categories UDTZ, and QVAX and be so listed at the time of Bid. The purpose of the regulation is to minimize electromagnetic interference between electronic products, which may diminish the performance of electrical products or disrupt essential communications.

E. All electronic equipment must conform to the requirements of FCC Regulation, Part 15, Governing Radio Frequency Electromagnetic Interference and be so labeled.

F. The manufacturer of the building automation system must provide documentation supporting compliance with ISO-9002 (Model for Quality Assurance in Production, Installation, and Servicing) and ISO-140001 (The application of well-accepted business management principles to the environment). The intent of this specification requirement is to ensure that the products from the manufacturer are delivered through a Quality System and Framework that will assure consistency in the products delivered for this project.

G. This system must have a documented history of compatibility by design for a minimum of 15 years. Future compatibility must be supported for no less than 10 years. Compatibility must be defined as the ability to upgrade existing field panels to current level of technology, and extend new field panels on a previously installed network.

H. Compatibility must be defined as the ability for any existing field panel microprocessor to be connected and directly communicate with new field panels without bridges, routers or protocol converters.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 GUARANTEE SERVICE

A. Furnish service and maintenance of control systems for one (1) year from Date of Substantial Completion.

B. Furnish complete service of controls systems, including callbacks. Make minimum of 4 complete normal inspections of approximately 8 hours duration in addition to normal service calls to inspect, calibrate, and adjust controls. Submit written report after each inspection.

C. Furnish four (4) complete inspections per year, one in each season, to inspect, calibrate and adjust controls. Submit written report after each inspection.

D. Examine unit components bi-monthly. Clean, adjust and lubricate equipment.

E. Include systematic examination, adjustment, and lubrication of unit, and controls checkout and adjustments. Repair or replace parts in accordance with manufacturer's operating and maintenance data. Use parts produced by manufacturer of original equipment.

F. Perform work without removing units from service during building normal occupied hours.

G. Provide emergency call back service during working hours for this maintenance period.

H. Maintain locally, near Place of the Work, adequate stock of parts for replacement or emergency purposes. Have personnel available to ensure fulfillment of this maintenance service, without unreasonable loss of time.

I. Perform maintenance work using competent and qualified personnel under supervision and in direct employ of manufacturer or original installer.

J. Do not assign or transfer maintenance service to agent or subcontractor without prior written consent of Commissioner.

PART 2 - PRODUCTS

2.1 DIRECT DIGITAL CONTROL

A. Contractor must coordinate with the City of New York to provide controls that match the building standard.
   1. Honeywell WEBs-8000:
      a. No Substitutions Permitted.

B. Furnish materials in accordance with NYCBC.

2.2 OPERATOR WORKSTATION

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Dell
   2. HP
   3. Lenovo
   4. Or approved equal.

B. Furnish materials in accordance with NYCBC.

C. Furnish each operator workstation consisting of the following:
   1. Personal Computer: IBM PC compatible with sufficient memory and hard drive storage to support graphics, reports and communication requirements. Furnish with the following minimum configuration requirements:
      a. Processor:
         1) Xeon
         2) Celeron
         3) Pentium 4 with HT Technology
         4) Or approved equal.
      b. Hard Drive: 500 Gigabyte.
      c. Memory: 8 Gigabyte DDR SDRAM.
      d. Ports: Required serial, parallel, network communications, USB and cables for proper system operation.
      e. Expansion Slots: 1 used for LAN card, 1 available.
      f. LAN Card: EtherNet - RJ45 (100 base-T minimum).
      g. Mouse: wired two-button optical type
      h. Keyboard: 104 key.
   2. Monitor: Minimum of 24-inch color, flat panel LED display.
   3. Operating System: Latest Windows that is compatible with the current building system.
   4. Printer: Furnish each operator workstation with laser printer and associated cables. Printer capable of minimum of 25 pages per minute (PPM) operation and compatible with standard parallel or USB communications or network capable.
   5. System Support: Minimum ten (10) workstations connected to multi-user, multi-tasking environment with concurrent capability to:
      a. Access Direct Digital Control network.
      b. Access or control same control unit.
      c. Access or modify same control unit database.
      d. Archive data, alarms, and network actions to hard disk regardless of what application programs are being currently executed.
      e. Develop and edit database.
      f. Implement and tune Direct Digital Control.
      g. Develop graphics.
      h. Control facility.

2.3 CONTROL UNITS

A. Units: Modular in design and consisting of processor board with programmable RAM memory, local operator access and display panel, and integral interface equipment located in NEMA 4 enclosures.

B. Battery Backup: For minimum of 100 hours for complete system including RAM without interruption, with automatic battery charger.

C. Control Units Functions:
   1. Monitor or control each input/output point.
   2. Completely independent with hardware clock/calendar and software to maintain control independently.

3. Acquire, process, and transfer information to operator station or other control units on network.
4. Accept, process, and execute commands from other control unit's or devices or operator stations.
5. Access both data base and control functions simultaneously.
6. Record, evaluate, and report changes of state or value occurring among associated points. Continue to perform associated control functions regardless of status of network.
7. Perform in stand-alone mode:
    a. Start/stop.
    b. Duty cycling.
    c. Automatic Temperature Control.
    d. Demand control via a sliding window, predictive algorithm.
    e. Event initiated control.
    f. Calculated point.
    g. Scanning and alarm processing.
    h. Full direct digital control.
    i. Trend logging.
    j. Global communications.
    k. Maintenance scheduling.

D. Global Communications:
1. Broadcast point data onto network, making information available to other system controls units.
2. Transmit input/output points onto network for use by other control units and use data from other control units.

E. Input/output Capability:
1. Discrete/digital input (contact status).
2. Discrete/digital output.
3. Analog input.
4. Analog output.
5. Pulse input (5 pulses/second).
6. Pulse output (0-655 seconds in duration with 0.01-second resolution).

F. Monitor, control, or address data points. Include analog inputs, analog outputs, pulse inputs, pulse outputs and discrete inputs/outputs. Furnish control units with minimum 30 percent spare capacity.

G. Point Scanning: Set scan or execution speed of each point to operator selected time from 1 to 250 seconds.

H. Upload/Download Capability: Download from or upload to operator station. Upload/Download time for entire control unit database maximum 10 seconds on hard-wired LAN or 60 seconds over voice grade phone lines.

I. Test Mode Operation: Place input/output points in test mode to allow testing and developing of control algorithms online without disrupting field hardware and controlled environment. In test mode:
1. Inhibit scanning and calculation of input points. Issue manual control to input points (set analog or digital input point to operator determined test value) from workstation.
2. Control output points but change only database state or value; leave external field hardware unchanged.
3. Enable control-actions on output points but change only data base state or value.

J. Local display and adjustment panel: Integral to control-unit containing digital display, and numerical keyboard. Display and adjust:
   1. Input/output point information and status
   2. Controller set points
   3. Controller tuning constants
   4. Program execution times
   5. High and low limit values
   6. Limit differential
   7. Set/display date and time
   8. Control outputs connected to the network
   9. Automatic control outputs
   10. Perform control unit diagnostic testing

K. Points in "Test" mode.

L. Direct Digital Control Controller:
   1. Direct Digital Control Controllers must be a 16-bit standalone, multi-tasking, multi-user, real-time digital control processors consisting of modular hardware with plug-in enclosed processors, communication controllers, power supplies and input/output point modules. Controller size must be sufficient to fully meet the requirements of this specification and the attached point I/O schedule. Each controller must support a minimum of three (3) Floor Level Application Specific Controller Device Networks.
   2. Each Direct Digital Control Controller must have sufficient memory to support its own operating system and databases, including:
      a. Control processes
      b. Energy management applications
      c. Alarm management applications including custom alarm messages for each level alarm for each point in the system.
      d. Historical/trend data for points specified
      e. Maintenance support applications
      f. Custom processes
      g. Operator I/O
      h. Dial-up communications
      i. Manual override monitoring
   3. Each Direct Digital Control Controller must support firmware upgrades without the need to replace hardware.
   4. Provide all processors, power supplies and communication controllers so that the implementation of a point only requires the addition of the appropriate point input/output termination module and wiring.
   5. Direct Digital Control Controllers must provide a minimum two (2) RS-232C serial data communication ports for operation of operator I/O devices such as industry standard printers, operator terminals, modems and portable laptop operator's terminals. Direct Digital Control Controllers must allow temporary use of portable devices without interrupting the normal operation of permanently connected modems, printers or terminals.
   6. The operator must have the ability to manually override automatic or centrally executed commands at the Direct Digital Control Controller via local, point discrete, on-board hand/off/auto operator override switches for digital control type points and gradual switches for analog control type points.
      a. Switches must be mounted either within the Direct Digital Control Controllers key-accessed enclosure, or externally mounted with each switch keyed to prevent unauthorized overrides.

b. Direct Digital Control Controllers must monitor the status of all overrides and inform the operator that automatic control has been inhibited. Direct Digital Control Controllers must also collect override activity information for reports.

7. Direct Digital Control Controllers must provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device. Graduated intensity LEDs or analog indication of value must also be provided for each analog output. Status indication must be visible without opening the panel door.
8. Each Direct Digital Control Controller must continuously perform self-diagnostics, communication diagnosis and diagnosis of all panel components. The Direct Digital Control Controller must provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication.
9. Isolation must be provided at all peer-to-peer network terminations, as well as all field point terminations to suppress induced voltage transients consistent with:
   a. RF-Conducted Immunity (RFCI) per ENV 50141 (IEC 1000-4-6) at 3 V
   b. Electro Static Discharge (ESD) Immunity per EN 61000-4-2 (IEC 1000-4-2) at 8 kV air discharge, 4 kV contact
   c. Electrical Fast Transient (EFT) per EN 61000-4-4 (IEC 1000-4-4) at 500 V signal, 1 kV power
   d. Output Circuit Transients per UL 864 (2,400V, 10A, 1.2 Joule max)
   e. Isolation must be provided at all peer-to-peer panel's AC input terminals to suppress induced voltage transients consistent with:
      1) IEEE Standard 587-1980
      2) UL 864 Supply Line Transients
      3) Voltage Sags, Surge, and Dropout per EN 61000-4-11 (EN 1000-4-11)
10. In the event of the loss of normal power, there must be an orderly shutdown of all Direct Digital Control Controllers to prevent the loss of database or operating system software. Non-volatile memory must be incorporated for all critical controller configuration data and battery backup must be provided to support the real-time clock and all volatile memory for a minimum of 60 days.
    a. Upon restoration of normal power, the Direct Digital Control Controller must automatically resume full operation without manual intervention.
    b. Should Direct Digital Control Controller memory be lost for any reason, the user must have the capability of reloading the Direct Digital Control Controller via the local RS-232C port, via telephone line dial-in or from a network workstation PC.
11. Provide a separate Direct Digital Control Controller for each AHU and/or other HVAC systems indicated in Section 3. It is intended that each unique system be provided with its own point resident Direct Digital Control Controller.

M. HVAC Mechanical Equipment Controllers:
1. HVAC Mechanical Equipment Controllers must be a 12-bit stand-alone, multi-tasking, multi-user, real-time digital control processors consisting of modular hardware with plug-in enclosed processors.
2. Each HVAC Mechanical Controller must have sufficient memory to support its own operating system and databases, including:
   a. Control processes
   b. Energy management applications
   c. Alarm management applications including custom alarm messages for each level alarm for each point in the system.
   d. Historical/trend data for points specified
   e. Maintenance support applications
   f. Custom processes

g. Operator I/O
h. Dial-up communications

3. Each HVAC Mechanical Equipment Controller must support firmware upgrades without the need to replace hardware.
4. HVAC Mechanical Equipment Controllers must provide a RS-232C serial data communication port for operation of operator I/O devices such as industry standard printers, operator terminals, modems and portable laptop operator's terminals.
5. HVAC Mechanical Equipment Controllers must provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device.
6. Each HVAC Mechanical Equipment Controller must continuously perform self-diagnostics, communication diagnosis and diagnosis of all components. The HVAC Mechanical Equipment Controller must provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication.
7. Isolation must be provided at all peer-to-peer network terminations, as well as all field point terminations to suppress induced voltage transients consistent with:
   a. RF-Conducted Immunity (RFCI) per ENV 50141 (IEC 1000-4-6) at 3 V
   b. Electro Static Discharge (ESD) Immunity per EN 61000-4-2 (IEC 1000-4-2) at 8 kV air discharge, 4 kV contact
   c. Electrical Fast Transient (EFT) per EN 61000-4-4 (IEC 1000-4-4) at 500 V signal, 1 kV power
   d. Output Circuit Transients per UL 864 (2,400V, 10A, 1.2 Joule max)
   e. Isolation must be provided at all peer-to-peer panel's AC input terminals to suppress induced voltage transients consistent with:
      1) IEEE Standard 587-1980
      2) UL 864 Supply Line Transients
      3) Voltage Sags, Surge, and Dropout per EN 61000-4-11 (EN 1000-4-11)
8. In the event of the loss of normal power, there must be an orderly shutdown of all HVAC Mechanical Equipment Controllers to prevent the loss of database or operating system software. Non-volatile memory must be incorporated for all critical controller configuration data and battery backup must be provided to support the real-time clock and all volatile memory for a minimum of 72 hours.
   a. Upon restoration of normal power, the HVAC Mechanical Equipment Controller must automatically resume full operation without manual intervention.
9. Should HVAC Mechanical Equipment Controller memory be lost for any reason, the user must have the capability of reloading the HVAC Mechanical Equipment Controller via the local RS-232C port, via telephone line dial-in or from a network workstation PC.

N. Floor Level Network Application Specific Controllers (ASC)
1. Each Direct Digital Control Controller must be able to extend its performance and capacity through the use of remote application specific controllers (ASCs) through Floor Level LAN Device Networks.
2. Each ASC must operate as a standalone controller capable of performing its specified control responsibilities independently of other controllers in the network. Each ASC must be a microprocessor-based, multi-tasking, real-time digital control processor. Provide the following types of ASCs as a minimum:
   a. Central System Controllers
   b. Terminal Equipment Controllers:
      1) Each ASC must be capable of control of the terminal device independent of the manufacturer of the terminal device.

3. Central System Controllers:
   a. Provide for control of central HVAC systems and equipment including, but not limited to, the following:
      1) Air handling units
      2) Rooftop units and split system
   b. Controllers must include all point inputs and outputs necessary to perform the specified control sequences. Provide a hand/off/automatic switch for each digital output for manual override capability. Switches must be mounted either within the controller's key-accessed enclosure, or externally mounted with each switch keyed to prevent unauthorized overrides. In addition, each switch position must be supervised in order to inform the system that automatic control has been overridden.
   c. Each controller must support its own real-time operating system. Provide a time clock with battery backup to allow for standalone operation in the event communication with its Direct Digital Control Controller is lost and to ensure protection during power outages.
   d. All programs must be field-customized to meet the user's exact control strategy requirements. Central System controllers utilizing pre-packaged or canned programs will not be acceptable. As an alternative, provide Direct Digital Control Controllers for all central equipment in order to meet custom control strategy requirements.
   e. Programming of central system controllers must utilize the same language and code as used by Direct Digital Control Controllers to maximize system flexibility and ease of use. Should the system controller utilize a different control language, provide a Direct Digital Control Controller to meet the specified functionality.
   f. Each controller must have connection provisions for a portable operator's terminal. This tool must allow the user to display, generate or modify all point databases and operating programs.
   g. Provide a door-mounted interface terminal to allow for direct-user access to the controller.
      1) The terminal must provide the user with the following functionality as a minimum:
         a) View and set date and time
         b) Modify and override time-of-day schedules
         c) Viewpoints and alarms
         d) Monitor points
         e) Command and modify setpoints
      2) Provide local user display in accordance with paragraph 2.5.
4. Terminal Equipment Controllers:
   a. Provide for control of each piece of equipment, including, but not limited to, the following:
      1) Variable Air Volume (VAV) boxes
      2) Fan-Powered Variable Air Volume (FPVAV)
      3) Terminal Devices
   b. Controllers must include all point inputs and outputs necessary to perform the specified control sequences. Analog outputs must be industry standard signals such as 24V floating control, 3-15 psi pneumatic, 0-10v, allowing for interface to a variety of modulating actuators.
   c. All controller sequences and operation must provide closed loop control of the intended application. Closing control loops over the FLN, BLN or MLN is not acceptable.

O. Additional features:
   1. The enclosure for all controllers must be NEMA Type 4 which must not be mounted directly to the unit nor to the wall. The conduit entering points must be located at bottom of the enclosure.
   2. All controllers must have manual overrides at the panels to manually adjust the setpoints without using computer or hand-held device.

2.4 LOCAL AREA NETWORKS (LAN)

A. The design of the BAS must network operator workstations and standalone Direct Digital Control Controllers (SAC). The network architecture must consist of three levels, a campus-wide (Management Level Network) Ethernet network based on TCP/IP protocol, high performance peer-to-peer building level network(s) and Direct Digital Control Controller floor level local area networks with access being totally transparent to the user when accessing data or developing control programs. All controllers must be standalone Direct Digital Control (SAC) controllers. Loss of network communications must not stop/limit the control sequences specified herein.

B. Provide communication between control units over local area network (LAN).

C. LAN Capacity: Not less than 100 stations or nodes.

D. Break in Communication Path: Alarm and automatically initiate LAN reconfiguration.

E. LAN Data Speed: Minimum 56 Kb.

F. Communication Techniques: Allow interface into network by multiple operation stations and by auto-answer/auto-dial modems. Support communication over telephone lines utilizing modems.

G. Transmission Median: Fiber optic or single pair of solid 24 gauge twisted, shielded copper cable.

H. Network Support: Time for global point to be received by any station, less than 3 seconds. Furnish automatic reconfiguration when station is added or lost. In event transmission cable is cut, reconfigure two (2) sections with no disruption to system's operation, without operator intervention.

I. System must have the capability to communicate with a BACnet network over Ethernet or BACnet/IP (according to Annex J). The intent is to use the system provided to communicate with control systems provided by other vendors. In order to accomplish monitoring, commanding, and alarming as described in sections 2.9 B and 2.9 D, the following BACnet objects and services must be supported by the system.
   1. The following BACnet standard objects, at a minimum, must be supported by the system:
      a. Device
      b. Analog Input
      c. Analog Output
      d. Binary Input
      e. Binary Output
      f. Notification Class
   2. The following BACnet services must be supported for the system to act as a BACnet server as described below:
      a. For the system to communicate with/on a BACnet network, it must support the following:

BACnet Service	Initiate	Execute
Who-Has		X
I-Have	X	
Who-Is		X
I-Am	X	

b. For the system to allow other BACnet devices to monitor its point values, the system must support the following:

BACnet Service	Initiate	Execute
Read Property		X

c. For the system to allow other BACnet devices to command its point values, the system must support the following:

BACnet Service	Initiate	Execute
Write Property		X

d. For the system to be able to send alarms to other BACnet devices and receive alarm acknowledgement, the system must support the following:

BACnet Service	Initiate	Execute
Add List Element		X
Remove List Element		X
Acknowledge Alarm		X
Get Alarm Summary		X
Confirmed or Unconfirmed Event Notification	X	

e. If the system will be sending messages to other BACnet devices via COV, it must support the following:

BACnet Service	Initiate	Execute
Subscribe COV		X
Confirmed or Unconfirmed COV Notification	X	

3. The following BACnet services must be supported for the system to act as a BACnet client as described below:
   a. For the system to communicate with/on a BACnet network, it must support the following:

BACnet Service	Initiate	Execute
Who-Has		X
I-Have	X	
Who-Is		X
I-Am	X	

b. For the system to be able to monitor point values from other BACnet devices, the system must support the following:

BACnet Service	Initiate	Execute
Read Property	X	

c. For the system to be able to command point values in other BACnet devices, the system must support the following:

BACnet Service	Initiate	Execute
Write Property	X	

d. For the system to be able to receive alarms from points in other BACnet devices, the system must support the following:

BACnet Service	Initiate	Execute
Add List Element	X	
Remove List Element	X	
Acknowledge Alarm	X	
Get Alarm Summary	X	
Confirmed or Unconfirmed Event Notification		X

e. If the system is capable of receiving BACnet point messages via COV, it must support the following:

BACnet Service	Initiate	Execute
Subscribe COV	X	
Confirmed or Unconfirmed COV Notification		X

J. Peer-to-Peer Building Level Network:

1. All operator devices either network resident or connected via dial-up modems must have the ability to access all point status and application report data or execute control functions for any and all other devices via the peer-to-peer network. No hardware or software limits must be imposed on the number of devices with global access to the network data at any time.
2. The peer-to-peer network must support a minimum of 100 Direct Digital Control controllers and PC workstations
3. Each PC workstation must support a minimum of 4 peer to peer networks hardwired or dial up.
4. The system must support integration of third-party systems (fire alarm, security, lighting, PCL, air conditioning units, boiler) via panel mounted open protocol processor. This processor must exchange data between the two systems for interprocess control. All exchange points must have full system functionality as specified herein for hardwired points.
5. Field panels must be capable of integration with open standards including Modbus, BACnet, and Lonworks as well as with third party devices via existing vendor protocols.

6. Telecommunication Capability:

a. Auto-dial/auto-answer communications must be provided to allow Direct Digital Control Controllers to communicate with remote operator stations and/or remote terminals via telephone lines. A remote location for monitoring will be determined by the Commissioner.
b. Auto-dial Direct Digital Control Controllers must automatically place calls to workstations to report alarms or other significant events. The auto-dial program must include provisions for handling busy signals, "no answers" and incomplete data transfers.
c. Operators at dial-up workstations must be able to perform all control functions, all report functions and all database generation and modification functions as described for workstations connected via the network. Routines to automatically answer calls from remote Direct Digital Control or HVAC Mechanical Equipment Controllers must be inherent in the Controller. The use of additional firmware or software is not acceptable. The fact that communications are taking place with remote Direct Digital Control or HVAC and Mechanical Equipment Controllers over telephone lines must be completely transparent to an operator.
d. Multiple modems must be supported by Direct Digital Control or HVAC and Mechanical Equipment Controllers on the Peer-to-Peer Network to ensure continuous communication to workstation.

K. Management Level Network:
1. All PCs must simultaneously direct connect to the Ethernet and Building Level Network without the use of an interposing device
2. Operator Workstation must be capable of simultaneous direct connection and communication with BACnet, OPC, and Apogee networks without the use of interposing devices.
3. The Management Level Network must not impose a maximum constraint on the number of operator workstations.
4. When appropriate, any controller residing on the peer-to-peer building level networks must connect to Ethernet network without the use of a PC or a gateway with a hard drive.
5. Any PC on the Ethernet Management Level Network must have transparent communication with controllers on the building level networks connected via Ethernet, as well as, directly connected building level networks. Any PC must be able to interrogate any controller on the building level network.
6. Any break in Ethernet communication from the PC to the controllers on the building level networks must result in an alarm notification at the PC and must not stop/limit operation of the system.
7. The Management Level Network must reside on industry standard Ethernet utilizing standard TCP/IP, IEEE 802.3.
8. Access to the system database must be available from any client workstation on the Management Level Network.

2.5 OPERATING SYSTEM SOFTWARE

A. Input/output Capability from Operator Station:
1. Request display of current values or status in tabular or graphic format.
2. Command selected equipment to specified state.
3. Initiate logs and reports.
4. Change analog limits.
5. Add, delete or change points within each control unit or application routine.
6. Change point input/output descriptors, status, alarm descriptors and unit descriptors.
7. Add new control units to system.
8. Modify and set up maintenance scheduling parameters.

9. Develop, modify, delete or display full range of color graphic displays.
10. Automatically archive select data even when running third party software.
11. Capability to sort and extract data from archived files and to generate custom reports.
12. Support two printer operations.
13. Alarm printer: Print alarms, operator acknowledgments, action messages, system alarms, operator sign-on and sign-off.
14. Data printer: Print reports, page prints, and data base prints.
15. Select daily, weekly or monthly as scheduled frequency to synchronize time and date in digital control units. Accommodate daylight savings time adjustments.
16. Print selected control unit database.

B. Operator System Access: Via software password with minimum 30 access levels at workstation and minimum 3 access levels at each control unit.

C. Data Base Creation and Support: Use standard procedures for changes. Control unit automatically checks workstation data base files upon connection and verify data base match. Include the following minimum capabilities:
1. Add and delete points.
2. Modify point parameters.
3. Change, add, or delete English language descriptors.
4. Add, modify, or delete alarm limits.
5. Add, modify, or delete points in start/stop programs, trend logs, and other items.
6. Create custom relationship between points.
7. Create or modify Direct Digital Control loops and parameters.
8. Create or modify override parameters.
9. Add, modify, and delete applications programs.
10. Add, delete, develop, or modify dynamic color graphic displays.

D. Dynamic Color Graphic Displays:
1. Utilizes custom symbols or system supported library of symbols.
2. Sixteen (16) colors.
3. Sixty (60) outputs of real-time live dynamic data for each graphic.
4. Dynamic graphic data.
5. 1,000 separate graphic pages.
6. Modify graphic screen refresh rate between 1 and 60 seconds.

E. Operator Station:
1. Accept data from LAN as needed without scanning entire network for updated point data.
2. Interrogate LAN for updated point data when requested.
3. Allow operator command of devices.
4. Allow operator to place specific control units in or out of service.
5. Allow parameter editing of control units.
6. Store duplicate data base for every control unit and allow downloading while system is online.
7. Control or modify specific programs.
8. Develop, store and modify dynamic color graphics.
9. Data archiving of assigned points and support overlay graphing of this data using up to four (4) variables.

F. Alarm Processing:
1. Off normal condition: Cause alarm and appropriate message, including time, system, point descriptor, and alarm condition. Select alarm state or value and alarms causing automatic dial-out.
2. Critical alarm or change-of-state: Display message, stored on disk for review and sort, or print.
3. Print online changeable message, up to 60 characters in length, for each alarm point specified.
4. Display alarm reports on video. Display multiple alarms in order of occurrence.
5. Define time delay for equipment start-up or shutdown.
6. Allow unique routing of specific alarms.
7. Operator specifies when alarm requires acknowledgment.
8. Continue to indicate unacknowledged alarms after return to normal.
9. Alarm notification:
10. Print automatically.
11. Display indicating alarm condition.
12. Selectable audible alarm indication.

G. Event Processing: Automatically initiate commands, user defined messages, take specific control actions or change control strategy and application programs resulting from event condition. Event condition may be value crossing operator defined limit, change of state, specified state, or alarm occurrence or return to normal.

H. Automatic Restart: Automatically start field equipment on restoration of power. Furnish time delay between individual equipment restart and time of day start/stop.

I. Messages:
1. Automatically display or print user-defined message subsequent to occurrence of selected events.
2. Compose, change, or delete message.
3. Display or log message at any time.
4. Assign any message to event.

J. Reports:
1. Manually requested with time and date.
2. Long term data archiving to hard disk.
3. Automatic directives to download to transportable media including floppy diskettes for storage.
4. Data selection methods to include data base search and manipulation.
5. Data extraction with mathematical manipulation.
6. Data reports to allow development of XY curve plotting, tabular reports (both statistical and summary), and multi-point timed based plots with not less than four (4) variables displayed.
7. Generating reports either normally at operator direction, or automatically under workstation direction.
8. Either manually display or print reports. Automatically print reports on daily, weekly, monthly, yearly or scheduled basis.
9. Include capability for statistical data manipulation and extraction.
10. Capability to generate four types of reports: Statistical detail reports, summary reports, trend graphic plots, x-y graphic plots.

K. Parameter Save/Restore: Store most current operating system, parameter changes, and modifications on8GB Flash drive.

L. Data Collection:

1. Automatically collect and store in 8GB Flash drive.
2. Daily electrical energy consumption, peak demand, and time of peak demand for up to electrical meters over 2-year period.
3. Daily consumption for up to 30 meters over a 2-year period.
4. Daily billable electrical energy consumption and time for up to 1024 zones over a 10-year period.
5. Archiving of stored data for use with system supplied custom reports.

M. Graphic Display: Support graphic development on workstation with software features:
1. Page linking.
2. Generate, store and retrieve library symbols.
3. Single or double height characters.
4. Sixty (60) dynamic points of data for each graphic page.
5. Pixel level resolution.
6. Animated graphics for discrete points.
7. Analog bar graphs.
8. Display real time value of each input or output line diagram fashion.

N. Maintenance Management:
1. Run time monitoring, for each point.
2. Maintenance scheduling targets with automatic annunciation, scheduling and shutdown.
3. Equipment safety targets.
4. Display of maintenance material and estimated labor.
5. Target point reset, for each point.

O. Advisories:
1. Summary containing status of points in locked out condition.
2. Continuous operational or not operational report of interrogation of system hardware and programmable control units for failure.
3. Report of power failure detection, time and date.
4. Report of communication failure with operator device, field interface unit, point and programmable control unit.

2.6 LOAD CONTROL PROGRAMS

A. General: Support inch-pounds and S.I. metric units of measurement.

B. Demand Limiting:
1. Monitor total power consumption for each power meter and shed associated loads automatically to reduce power consumption to an operator set maximum demand level.
2. Input: Pulse count from incoming power meter connected to pulse accumulator in control unit.
3. Forecast demand (kW): Predicted by sliding window method.
4. Automatically shed loads throughout the demand interval selecting loads with independently adjustable on and off time of between one and 255 minutes.
5. Demand Target: Minimum of 3 for each demand meter; change targets based upon (1) time, (2) status of pre-selected points, or (3) temperature.
6. Load: Assign load shed priority, minimum "On" time and maximum "Off" time.
7. Limits: Include control band (upper and lower limits).

8. Output advisory when loads are not available to satisfy required shed quantity, advise shed requirements and requiring operator acknowledgment.

C. Duty Cycling:
1. Periodically stop and start loads, based on space temperature, and according to various On/Off patterns.
2. Modify off portion of cycle based on operator specified comfort parameters. Maintain total cycle time by increasing on portion of cycle by equal quantity off portion is reduced.
3. Set and modify following parameters for each individual load.
   a. Minimum and maximum off time.
   b. On/Off time in one-minute increments.
   c. Time period from beginning of interval until cycling of load.
   d. Manually override the Direct Digital Control program and place a load in an On or Off state.
   e. Cooling Target Temperature and Differential.
   f. Heating Target Temperature and Differential.
   g. Cycle off adjustment.

D. Automatic Time Scheduling:
1. Self-contained programs for automatic start/stop/scheduling of building loads.
2. Support up to seven (7) normal day schedules, seven (7) "special day" schedules and two (2) temporary day schedules.
3. Special day's schedule supporting up to 30 unique date/duration combinations.
4. Number of loads assigned to time program; with each load having individual time program.
5. Each load assigned at least 16 control actions for each day with 1 minute resolution.
6. Furnish the following time schedule operations:
   a. Start.
   b. Optimized Start.
   c. Stop.
   d. Optimized Stop.
   e. Cycle.
   f. Optimized Cycle.
7. Capable of specifying minimum of 30 holiday periods up to 100 days in length for the year.
8. Create temporary schedules.
9. Broadcast temporary "special day" date and duration.

E. Start/Stop Time Optimization:
1. Perform optimized start/stop as function of outside conditions, inside conditions, or both.
2. Adaptive and self-tuning, adjusting to changing conditions unattended.
3. For each point under control, establish and modify:
   a. Occupancy period.
   b. Desired temperature at beginning of occupancy period.
   c. Desired temperature at end of occupancy period.

F. Night Setback/Setup Program: Reduce heating space temperature set point or raise cooling space temperature set-point during unoccupied hours; in conjunction with scheduled start/stop and optimum start/stop programs.

G. Calculated Points: Define calculations and totals computed from monitored points (analog/digital points), constants, or other calculated points.
   1. Employ arithmetic, algebraic, Boolean, and special function operations.
   2. Treat calculated values like any other analog value; use for any function where a "hard wired point" might be used.

H. Event Initiated Programming: Any data point capable of initiating event, causing series of controls in a sequence.
   1. Define time interval between each control action between 0 to 3600 seconds.
   2. Output may be analog value.
   3. Provide for "skip" logic.
   4. Verify completion of one action before proceeding to next action. When not verified, program capable of skipping to next action.

I. Direct Digital Control: Furnish with each control unit Direct Digital Control software so operator is capable of customizing control strategies and sequences of operation by defining appropriate control loop algorithms and choosing optimum loop parameters.
   1. Control loops: Defined using "modules" are analogous to standard control devices.
   2. Output: Paired or individual digital outputs for pulse width modulation, and analog outputs.
   3. Firmware:
      a. PID with analog or pulse-width modulation output.
      b. Floating control with pulse-width modulated outputs.
      c. Two-position control.
      d. Primary and secondary reset schedule selector.
      e. Hi/Low signal selector.
      f. Single pole double-throw relay.
      g. Single pole double throw time delay relay with delay before break, delay before make and interval time capabilities.
   4. Direct Digital Control loop: Downloaded upon creation or on operator request. On sensor failure, program executes user defined failsafe output.
   5. Display: Value or state of each of lines interconnecting Direct Digital Control modules.

J. Fine Tuning Direct Digital Control PID or floating loops:
   1. Display information:
      a. Control loop being tuned.
      b. Input (process) variable.
      c. Output (control) variable.
      d. Set-point of loop.
      e. Proportional band.
      f. Integral (reset) Interval.
      g. Derivative (rate) Interval.
   2. Display format: Graphic, with automatic scaling; with input and output variable superimposed on graph of "time" versus "variable".

K. Trend logging:
   1. Each control unit capable of storing samples of control unit's data points.
   2. Update file continuously at operator assigned intervals.
   3. Automatically initiate upload requests and then stores data on hard disk.

4. Time synchronize sampling at operator specified times and intervals with sample resolution of one minute.
5. Co-ordinate sampling with specified on/off point- state.
6. Display trend samples on workstation in graphic format. Automatically scale trend graph with minimum 60 samples of data in plot of time versus data.

2.7 HVAC CONTROL PROGRAMS

A. General:
1. Support Inch-pounds and S.I. metric units of measurement.
2. Identify each Control system.

B. Optimal Run Time:
1. Control start-up and shutdown times of equipment for both heating and cooling.
2. Based on occupancy schedules, outside air temperature, seasonal requirements, and interior room mass temperature.
3. Start-up systems by using outside air temperature, room mass temperatures, and adaptive model prediction for how long building takes to warm up or cool down under different conditions.
4. Use outside air temperature to determine early shut down with ventilation override.
5. Analyze multiple building mass sensors to determine seasonal mode and worse case condition for each day.
6. Operator commands:
   a. Define term schedule.
   b. Add/delete fan status point.
   c. Add/delete outside air temperature point.
   d. Add/delete mass temperature point.
   e. Define heating/cooling parameters.
   f. Define mass sensor heating/cooling parameters.
   g. Lock/unlock program.
   h. Request optimal run-time control summary.
   i. Request optimal run-time mass temperature summary.
   j. Request point summary.
   k. Request saving profile summary.
7. Control Summary:
   a. Control system begin/end status.
   b. Optimal run time lock/unlock control status.
   c. Heating/cooling mode status.
   d. Optimal run time schedule.
   e. Start/Stop times.
   f. Selected mass temperature point ID.
   g. Optimal run-time system normal start-times.
   h. Occupancy and vacancy times.
   i. Optimal run time system heating/cooling mode parameters.
8. Mass temperature summary:
   a. Mass temperature point type and ID.
   b. Desired and current mass temperature values.
   c. Calculated warm-up/cool-down time for each mass temperature.
   d. Heating/cooling season limits.

e. Break point temperature for cooling mode analysis.

9. Point summary:
   a. Control system identifier and status.
   b. Point ID and status.
   c. Outside air temperature point ID and status.
   d. Mass temperature point ID and status.
   e. Calculated optimal start and stop times.
   f. Period start.

C. Supply Air Reset:
1. Monitor heating and cooling loads in building spaces, terminal reheat systems, both hot deck and cold deck temperatures on dual duct and multizone systems, single zone unit discharge temperatures.
2. Adjust discharge temperatures to most energy efficient levels satisfying measured load by:
   a. Raising cooling temperatures to highest possible value.
   b. Reducing heating temperatures to lowest possible level.
3. Operator commands:
   a. Add/delete fan status point.
   b. Lock/unlock program.
   c. Request point summary.
   d. Add/Delete discharge controller point.
   e. Define discharge controller parameters.
   f. Add/delete air flow rate.
   g. Define space load and load parameters.
   h. Request space load summary.
4. Control summary:
   a. Control system status (begin/end).
   b. Supply air reset system status.
   c. Optimal run time system status.
   d. Heating and cooling loop.
   e. High/low limits.
   f. Deadband.
   g. Response timer.
   h. Reset times.
5. Space load summary:
   a. System status.
   b. Optimal run time status.
   c. Heating/cooling loop status.
   d. Space load point ID.
   e. Current space load point value.
   f. Control heat/cool limited.
   g. Gain factor.
   h. Calculated reset values.
   i. Fan status point ID and status.
   j. Control discharge temperature point ID and status.
   k. Space load point ID and status.
   l. Airflow rate point ID and status.

D. Static Pressure Reset:
   1. Monitor static pressure in supply air system and corresponding VAV box position.
   2. Reduce static pressure setpoint and resultant fan speed to utilize minimum fan energy.

E. Enthalpy Switchover:
   1. Calculate outside and return air enthalpy using measured temperature and relative humidity; determine energy expended and control outside and return air dampers.
   2. Operator commands:
      a. Add/delete fan status point.
      b. Add/delete outside air temperature point.
      c. Add/delete discharge controller point.
      d. Define discharge controller parameters.
      e. Add/delete return air temperature point.
      f. Add/delete outside air dewpoint/humidity point.
      g. Add/delete return air dewpoint/humidity point.
      h. Add/delete damper switch.
      i. Add/delete minimum outside air.
      j. Add/delete atmospheric pressure.
      k. Add/delete heating override switch.
      l. Add/delete evaporative cooling switch.
      m. Add/delete air flow rate.
      n. Define enthalpy deadband.
      o. Lock/unlock program.
      p. Request control summary.
      q. Request HVAC point summary.
   3. Control summary:
      a. HVAC control system begin/end status.
      b. Enthalpy switchover optimal system status.
      c. Optimal return time system status.
      d. Current outside air enthalpy.
      e. Calculated mixed air enthalpy.
      f. Calculated cooling cool enthalpy using outside air.
      g. Calculated cooling cool enthalpy using mixed air.
      h. Calculated enthalpy difference.
      i. Enthalpy switchover deadband.
      j. Status of damper mode switch.

F. Freeze protection.

G. Smoke Control.

2.8 CHILLER PLANT CONTROL PROGRAMS

A. Control function of condenser water reset, chilled water reset, and chiller sequencing. Support inch-pounds and S.I. metric units of measurement.

B. Condenser Water Reset: Automatically reset controlled condenser water temperature using measured outside wet bulb temperature and load being handled.

C. Chilled Water Reset: Automatically reset controlled chilled water temperature satisfying cooling coil requiring greatest cooling.

D. Chiller Sequencing: Determine combination of chillers most efficiently satisfies chilled water load, by cycling chillers, based on comparing load to switchover limits defined for each chiller.

E. Chiller Plant Optimization Program: This program must be based on a knowledge of requirements in this Section, as well as consultation with manufacturers of chillers and all auxiliaries such as pumps, cooling towers, etc., as to performance and operation of each component, not only at design conditions but at all other load conditions as well.

F. System analysis and programming must be done in stages as described below and the Contractor must provide all required hardware required for its implementation:
   1. Control leaving chilled water temperature of each chiller.
   2. Turn on and off as needed auxiliary motors, valves, pumps, and so on, all under full software stored program control.
   3. Chiller water temperature reset.
   4. Control or proportion the total refrigeration (tons) load each chiller will produce at various partial loads, based on optimized efficiency of operation of total plant.
   5. Control condenser water temperature and relate to actual needs of Chiller Plant.
   6. Adjust speed of variable frequency drives to maintain proper condenser water and chilled water flow rates to each chiller.

2.9 PROGRAMMING APPLICATION FEATURES

A. Trend Point:
   1. Sample up to 50 points, real or computed, with each point capable of collecting 10,000 samples at intervals specified in minutes, hours, days, or month.
   2. Output trend logs as line-graphs or bar graphs. Output graphic on terminal, with each point for line and bar graphs designated with a unique color, vertical scale either actual values or percent of range, and horizontal scale time base. Print trend logs up to 12 columns of one point/column.

B. Alarm Messages:
   1. Allow definition of minimum of 100 messages, each having minimum length of 100 characters for each individual message.
   2. Assign alarm messages to system messages including point's alarm condition, point's off-normal condition, totaled point's warning limit, hardware elements advisories.
   3. Output assigned alarm with "message requiring acknowledgment".
   4. Operator commands include define, modify, or delete; output summary listing current alarms and assignments; output summary defining assigned points.

C. Weekly Scheduling:
   1. Automatically initiate equipment or system commands, based on selected time schedule for points specified.
   2. Program times for each day of week, for each point, with one minute resolution.
   3. Automatically generate alarm output for points not responding to command.
   4. Allow for holidays, minimum of 366 consecutive holidays.
   5. Operator commands:

a. System logs and summaries.
b. Start of stop point.
c. Lock or unlock control or alarm input.
d. Add, delete, or modify analog limits and differentials.
e. Adjust point operation position.
f. Change point operational mode.
g. Open or close point.
h. Enable/disable, lock/unlock, or execute interlock sequence or computation profile.
i. Begin or end point totals.
j. Modify total values and limits.
k. Access or secure point.
l. Begin or end HVAC or load control system.
m. Modify load parameter.
n. Modify demand limiting and duty cycle targets.

6. Output summary: Listing of programmed function points, associated program times, and respective day of week programmed points by software groups or time of day.

D. Interlocking:
1. Permit events to occur, based on changing condition of one or more associated master points.
2. Binary contact, high/low limit of analog point or computed point capable of being used as master. Master capable of monitoring or commanding multiple slaves.
3. Operator commands:
a. Define single master/multiple master interlock process.
b. Define logic interlock process.
c. Lock/unlock program.
d. Enable/disable interlock process.
e. Execute terminate interlock process.
f. Request interlock type summary.

E. Interface to World Wide Web:
1. Contractor must provide all programming and interfaces as required to display and access all system features, including alarms, maintenance messages, graphics, etc. on the World Wide Web.
2. The central BAS console must be arranged to monitor, control and supervise all system items specified in this section, remotely, via the World Wide Web, using secured network connections. Specific alarms as defined by the City of New York must be connected to the Library Public Safety Network. Contractor must be responsible for all software and hardware requirements, as required for a complete and operational system. Contractor must be responsible for coordinating network interface requirements with the City of New York.
3. Coordinate Uniform Resource Locator (URL) address name with the Commissioner. Contractor must be responsible for coordinating and obtaining Internet Service Provider.

2.10 ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. Disconnect Switch: Factory-mount on equipment.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify conditioned power supply is available to control units and to operator workstation.

B. Verify field end devices, wiring, and pneumatic tubing is installed prior to installation proceeding.

3.3 INSTALLATION

A. Install control units and other hardware in position on permanent walls where not subject to excessive vibration.

B. Install software in control units and in operator workstation. Implement features of programs to specified requirements and appropriate to sequence of operation. Refer to Section 23 09 93.

C. Install with 120 volts alternating current, 15 amp dedicated emergency power circuit to each programmable control unit.

D. Install conduit and electrical wiring in accordance with Division 26.

E. Install electrical material and installation in accordance with appropriate requirements of Division 26.

F. Install all devices, sensors, etc. in sheet metal enclosures to prevent dust, dirt and water damage. Provide outdoor rated enclosures for devices exposed to weather.

3.4 MANUFACTURER'S FIELD SERVICES

A. Start and test systems. Allow adequate time for start-up and testing prior to placing control systems in permanent operation.

B. Furnish service technician employed by system installer to instruct the Commissioner in operation of systems plant and equipment for 3-day period.

3.5 COMMISSIONING, TESTING AND ACCEPTANCE

A. Coordinate all requirement with commissioning section 23 08 00.

B. Perform a three-phase commissioning procedure consisting of field I/O calibration and commissioning, system commissioning and integrated system program commissioning. Document all commissioning information on commissioning data sheets which must be submitted prior to acceptance testing. Commissioning work which requires shutdown of system or deviation from normal function must be performed when the operation of the system is not required. Commissioning must be coordinated with the

Commissioner to ensure systems are available when needed. Notify the operating personal in writing of the testing schedule so that the Commissioner is present throughout the commissioning procedure.

1. Prior to system program commissioning, verify that each control panel has been installed according to plans, specifications and approved shop drawings. Test, calibrate and bring online each control sensor and device. Commissioning to include, but not be limited to:
   a. Sensor accuracy at 10, 50 and 90% of range.
   b. Sensor range.
   c. Verify analog limit and binary alarm reporting.
   d. Point value reporting.
   e. Binary alarm and switch settings.
   f. Actuator ranges.
   g. Fail safe operation on loss of control signal, electric power, network communications.

C. After control devices have been commissioned (i.e., calibrated, tested and signed off), each BAS program must be put online and commissioned. The Contractor must, in the presence of the Commissioner, demonstrate each programmed sequence of operation and compare the results in writing. In addition, each control loop must be tested to verify proper response and stable control, within specified accuracies. System program test results must be recorded on commissioning data sheets and submitted for record. Any discrepancies between the specification and the actual performance will be immediately rectified and retested.

D. After all BAS programs have been commissioned, the Contractor must verify the overall system performance as specified. Tests must include, but not be limited to:
1. Data communication, both normal and failure modes.
2. Fully loaded system response time.
3. Impact of component failures on system performance and system operation.
4. Time/Date changes.
5. End of month/ end of year operation.
6. Season changeover.
7. Global application programs and point sharing.
8. System backup and reloading.
9. System status displays.
10. Diagnostic functions.
11. Power failure routines.
12. Battery backup.
13. Smoke Control, stair pressurization, stair, vents, in concert with Fire Alarm System testing.
14. Testing of all electrical and HVAC systems with other division of work.

E. Submit for approval, a detailed acceptance test procedure designed to demonstrate compliance with contractual requirements. This acceptance test procedure will take place after the commissioning procedure but before final acceptance, to verify that sensors and control devices maintain specified accuracies and the system performance does not degrade over time.

F. Using the commissioning test data sheets, the Contractor must demonstrate each point. The Contractor must also demonstrate all system functions. The Contractor must demonstrate all points and system functions until all devices and functions meet specification.

G. The Contractor must supply all instruments for testing and turn over same to the Commissioner after acceptance testing.
   1. All test instruments must be submitted for approval.
      a. Test Instrument Accuracy:

Temperature:	1/4F or 1/2% full scale, whichever is less.
Pressure:	High Pressure (psi): 1/2 psi or 1/2% full scale, whichever is less.
Low Pressure: (in w.c.)	1/2% of full scale
Humidity:	2% RH
Electrical:	1/4% full scale

H. After the above tests are complete and the system is demonstrated to be functioning as specified, a thirty-day performance test period must begin. If the system performs as specified throughout the test period, requiring only routine maintenance, the system will be accepted. If the system fails during the test, and cannot be fully corrected within eight hours, the Commissioner may request that performance tests be repeated.

3.6 DEMONSTRATION AND INSTRUCTION

A. Furnish basic operator instruction for 16 persons on data display, alarm and status descriptors, requesting data, execution commands and log requests. Include a minimum of 40 hours instructor time. Furnish instructions on site.

B. Demonstrate complete and operating system to the Commissioner.

3.7 ELECTRICAL WIRING AND MATERIALS

A. Install, connect and wire the items included under this Section and all other Sections of HVAC work. This work includes providing required conduit, wire, fittings, transformers and related wiring accessories. All conduit and wiring must be installed in accordance with Division 26 Specifications.

B. Provide conduit and wiring between thermostats, aquastats and unit heater motors, all control and alarm wiring for all control and alarm devices for all Sections of Specifications.

C. Provide 120 volt, single phase, 60 hertz emergency power to every B.M.S. Direct Digital Control Controller panel, HVAC/Mechanical Equipment Controller, PC console, power supply, transformer, annunciator, modems, printers and to other devices as required. It is the intent that the entire building management system, except terminal equipment, be operative under emergency power conditions in the building.

D. Provide status function conduit and wiring for equipment covered under this Section.

E. Provide conduit and wiring between the B.M.S. panels and the temperature, humidity, or pressure sensing elements, including low voltage control wiring in conduit.

F. Provide conduit and control wiring for devices specified in this Section.

G. Provide conduit and signal wiring between motor starters/disconnect switches in motor control centers and high and/or low temperature relay contacts and remote relays in B.M.S. panels located in the vicinity of motor control centers.

H. Provide conduit and wiring between the PC workstation, electrical panels, metering instrumentation, indicating devices, miscellaneous alarm points, remotely operated contactors, and B.M.S. panels, as shown on the drawings or as specified.

I. All wiring to be compliant with New York City building code and the NEC.

J. Provide all conduit wiring for boiler systems, chillers and AC units, as required for a complete and operational system.

K. Provide electrical wall box and conduits for all wall mounted devices.

L. 120 Volt wiring will be provided by Division 26 in the Telecom Closets on each floor for VAV boxes. HVAC Contractor must extend this wiring as required and provide all 120 volt to 24 volt transformers and wiring to each VAV box, controller, etc.

M. Reference Division 26 Specifications and drawings for conduit, wiring and accessories requirements.

END OF SECTION 23 09 23

SECTION 23 09 93 - SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 points to be connected to Direct Digital Control system.

B. Related Sections:
   1. Section 23 09 23 - Direct Digital Control System for HVAC: For equipment, devices, system components and software to implement sequences of operation.
   2. All sections related to products requiring control and monitoring.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate mechanical system controlled and control system components.
   1. Label with settings, adjustable range of control and limits. Submit written description of control sequence.
   2. Submit flow diagrams for each control system, graphically depicting control logic.
   3. Submit draft copies of graphic displays indicating mechanical system components, control system components, and controlled function status and value.
   4. Coordinate submittals with information requested in Section 23 09 23.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of components and set points of controls, including changes to sequences made after submission of shop drawings.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 AIR HANDLING UNITS (RTU-3 and RTU-4)

A. Safeties:
1. Automatic Operation: When alarmed, smoke detectors will stop the supply air and (through software interlock) and the return air fan. When smoke condition is cleared and detectors are reset, the system resumes normal operation.
2. Upon activation, the supply fan and (through software interlocked) and the return air fan will both shut down. To prevent nuisance fan shutdowns, there is a time delay of 0-30 seconds (adjustable) for both detectors before activation occurs. Once the fans have been shut down, manual reset, through a push button located at the Direct Digital Control Panel, is required to restart them.
3. The supply fan will shut down upon a high discharge pressure or low suction pressure condition and will stop the associated return fan through software interlock. The return fan will shut down upon a low suction pressure condition and will stop the associated supply fan through software interlock. The RTU units must be capable of remote restart at the BMS.

B. Unit Off:
1. Upon unit shutdown on schedule or a command from BAS, the fan motors will be de-energized, the air handling units outside air dampers and spill air dampers will close; the return air damper will open. The zone dampers will be open.

C. System Start Up:
1. The supply air fan of the air handling unit will be started per operation schedule or on a command from BMS and enable the outdoor air, spill air, and return air dampers. The zone dampers will fully open, and the supply and return fan will ramp up slowly, after 15 min of operation the zone dampers will go to their seasonal position. The supply fan and return fan will than modulate to maintain the fixed pressure setpoint set by the balancer for the respective seasonal operation. The outside air, return air and spill damper will modulate to their normal operating positions.
2. During system start up in heating season, the economizer cycle will be locked out for five minutes (adjustable) to prevent unstable operation of the outside air damper.

D. Unit On:
1. Occupied Mode:
   a. Static pressure sensor located 2/3 downstream will modulate the supply and return fan variable speed drive to maintain the static pressure setpoint.
      1) The unit operates to maintain a specific CFM during the heating and cooling season. The balancer must determine the static pressure setpoint for each seasonal mode.
         a) The supply and return fan unit VFD will modulate to maintain the pressure. The unit will operate as a constant volume system, with different volumes based on the season.
   b. Downstream zone damper operation:
      1) The RTU units serve multiple downstream zone dampers that operate to maintain a specific CFM at each diffuser, the dampers operate in a heating and cooling position.
      2) Although each damper will be modulating, the dampers will be commanded to a fixed position during the heating or cooling season. The balancer will coordinate with the BMS to determine this fixed position relative to the percentage damper command.
      3) The dampers must have a separate potentiometer-based position feedback to assure that the commanded versus the actual position is accurate.
      4) The CFM requirements for each diffuser is shown on the mechanical drawings.

2. Unoccupied Mode:
   a. In the unoccupied mode, the Outdoor air dampers will be closed. Spill Air dampers will be closed and return air dampers will be open. The zone dampers will be open. Fans will remain on standby.

E. Seasonal Mode:
1. System operation is automatically indexed to "Cooling Season" when the outside air temperature is greater than 61°F. When the outdoor air temperature is between 55°F and 60°F, 100% outside air will be used for cooling; below 56°F, outside air temperature program indexes system to "Heating Season". These modes setpoints can be adjusted at the BMS.
2. The air handling unit system's air discharge temperature is maintained at a given setpoint for the heating and cooling season:
   a. Heating Season – 80°F (adjustable)
   b. Cooling Season – 55°F (adjustable)

F. Heating:
1. To maintain discharge air temperature setpoint in the "Heating Season", the discharge air temperature sensor will modulate the gas fired furnace on the unit to maintain the adjustable heating season setpoint.
2. The downstream dampers will modulate and stay at the position set by the balancer to maintain a specific heating season CFM at the diffusers downstream.
3. The unit supply fan and return fan will operate to maintain a specific pressure setpoint as set by the balancer to maintain the CFM requirements downstream.

G. Cooling:
1. To maintain discharge air temperature setpoint in the "Cooling Season", the discharge air temperature sensor will activate the DX cooling system on the unit to maintain the adjustable cooling season setpoint.
2. The downstream dampers will modulate and stay at the position set by the balancer to maintain a specific cooling season CFM at the diffusers downstream.
3. The unit supply fan and return fan will operate to maintain a specific pressure setpoint as set by the balancer to maintain the CFM requirements downstream.

H. Economizer – 100% Outside Air for Cooling:
1. The economizer cycle, set for 100% outside air, will be operative whenever the outside air temperature is between 55°F and 60°F. (adj.). Below 55°F the air handler will be in heating mode. Above 61°F the air handler will be in cooling mode. For the economizer cycle at 100% outside air, the outside air damper will be open, the return air damper will be closed, and the spill air damper will stay open. The zone dampers will open to 100%.
2. During economizer operation, if the space temperature drops below 68°F the RTU unit after a 15 min time delay will activate heating mode. If the space temperature increases to above 74°F the RTU unit after a 15 min time delay will activate cooling mode.

I. Ventilation:
1. The unit must be provided with an outside air flow measuring station. The interior spaces will have a CO2 sensor. Based on feedback from the CO2 sensor, the RTU units will modulate the outside air, return air and spill air damper to provide the required outside air ventilation.

3.3 AIR HANDLING UNITS (AC-1)

A. Safeties:
1. Automatic Operation: When alarmed, smoke detectors will stop the supply air and (through software interlock) the return air fan. When smoke condition is cleared and detectors are reset, the system resumes normal operation.
2. Upon activation, the supply fan and (through software interlocked) the return air fan both shut down. To prevent nuisance fan shutdowns, there is a time delay of 0-30 seconds (adjustable) for both detectors before activation occurs. Once the fans have been shut down, manual reset, through a push button located at the Direct Digital Control Panel, is required to restart them.
3. Static Pressure Operation: The supply fan will shut down upon a high discharge pressure or low suction pressure condition and will stop the associated return fan through software interlock. The return fan will shut down upon a low suction pressure condition and stop the associated supply fan through software interlock. The unit must be capable of remote restart at the BMS.

B. Unit Off:
1. Upon unit shutdown on schedule or a command from BAS, the fan motors will be de-energized, the air handling unit's minimum and maximum outside air dampers and spill air dampers will close; the return air damper will open.

C. System Start Up:
1. The supply air fan of the air handling unit will be started per operation schedule or on a command from BMS and enable the outdoor air, spill air and return air dampers. The return air fan will be started through software interlock. The supply and return air fans will start with their respective variable speed drives at minimum flow position and remain at minimum flow for sixty seconds (adjustable). The outside air damper will open 100%. The spill air damper will open as required to meet outside air and the spill air damper will remain closed and remain in this position unless overridden by economizer control or by requirement for 100% outside air.
2. During system start up in winter, the economizer cycle will be locked out for five minutes (adjustable) to prevent unstable operation of the outside air damper.

D. Unit On:
1. Occupied Mode:
   a. Static pressure sensor located 2/3 downstream will modulate the supply and return fan variable speed drive to maintain the static pressure setpoint.
2. Unoccupied Mode:
   a. In the unoccupied mode, the Outdoor air dampers will be closed. Spill Air dampers will be closed and return air dampers will be open.

E. Seasonal Mode:
1. System operation is automatically indexed to "Cooling Season" when the outside air temperature is greater than 61°F. When the outdoor air temperature is between 55°F and 60°F, 100% outside air will be used for cooling; below 56°F, outside air temperature program indexes system to "Heating Season". These modes setpoints can be adjusted at the BMS.
2. The air handling unit system's air discharge temperature is maintained at a given setpoint for the heating and cooling season:
   a. Heating Season – 80°F (adjustable)
   b. Cooling Season – 55°F (adjustable)

F. Heating:
   1. To maintain discharge air temperature setpoint in the “Heating Season”, the discharge air temperature sensor will modulate the gas fired furnace on the unit to maintain the adjustable heating season setpoint.

G. Cooling:
   1. To maintain discharge air temperature setpoint in the “Cooling Season”, the discharge air temperature sensor will activate the DX cooling system on the unit to maintain the adjustable cooling season setpoint.

H. Economizer – 100% Outside Air for Cooling:
   1. The economizer cycle, set for 100% outside air, will be operative whenever the outside air temperature is between 55°F and 60°F. (adj.). Below 55°F the air handler will be in heating mode. Above 61°F the air handler will be in cooling mode. For the economizer cycle at 100% outside air, the outside air damper will be open, the return air damper will be closed, and the spill air damper will stay open.
   2. During economizer operation, if the space temperature drops below 68°F., the AC unit after a 15 min time delay will activate heating mode. If the space temperature increases to above 74°F., the AC unit after a 15 min time delay will activate cooling mode.

I. Ventilation:
   1. The unit must be provided with an outside air flow measuring station. The interior spaces have a CO2 sensor. Based on feedback from the CO2 sensor, the RTU units will modulate the outside air, return air and spill air damper to provide the required outside air ventilation.

3.4 TYPICAL EXHAUST FAN CONTROL

A. When the exhaust fan is off, its associated spill air damper or intake damper will be closed. When the exhaust fan is on, its associated dampers will open.

B. Start/stop programming of all such fans must be programmable from the BMS.

C. Provide status of the exhaust fan at the BMS.

D. For exhaust fans with VFD’s, points can be connected via BACnet or Modbus.

3.5 SUPPLY FAN CONTROL (SF-1)

A. When the supply fan is off, its associated spill air damper or intake damper will be closed. When the exhaust fan is on, its associated dampers will open.

B. Start/stop programming of all such fans must be programmable from the BMS.

C. Provide status of the supply fan at the BMS.

D. Points can be connected via BACnet or Modbus.

3.6 TYPICAL UNIT HEATERS AND CABINET UNIT HEATERS

A. The unit heaters are supplied with a thermostat to start/stop the unit based on space conditions.

B. The BMS must be capable of intercepting the thermostat to remote start/stop the unit.

C. The BMS must monitor the status of the unit fan running.

D. The BMS must monitor the status of the electric heating.

3.7 SPLIT AC SYSTEM

A. The split AC system must have entirely built-in control system. The BMS must interface to the system via a BACnet/IP or BACnet MS/TP connection.
   1. The BMS must display all read points on the BMS graphics.
   2. The BMS must be capable of modifying setpoints on all read/write points.

END OF SECTION 23 09 93

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. Section Includes:
1. Refrigerant piping.
2. Unions, flanges and couplings.
3. Refrigerant moisture and liquid indicators.
4. Valves.
5. Refrigerant strainers.
6. Refrigerant pressure regulators.
7. Refrigerant pressure relief valves.
8. Refrigerant filter-driers.
9. Refrigerant solenoid valves.
10. Refrigerant expansion valves.
11. Electronic expansion valves.
12. Refrigerant receivers.
13. Bedding and cover materials.

B. Related Sections:
1. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment: Product requirements for pipe hangers and supports, sleeves, and firestopping for placement by this section.
2. Section 23 05 48 - Noise and Vibration Controls for HVAC Piping and Equipment: Product requirements for Vibration Isolation for placement by this section.
3. Section 23 05 53 - Identification for HVAC Piping and Equipment: Product requirements for pipe identification for placement by this section.
4. Section 23 07 00 - HVAC Insulation: Product requirements for Piping Insulation for placement by this section.
5. Division 26 - Wiring Connections: Execution requirements for electric connections specified by this section.

1.3 REFERENCES

A. Air-Conditioning and Refrigeration Institute:
1. ARI 495 - Refrigerant Liquid Receivers.
2. ARI 710 - Liquid-Line Driers.
3. ARI 730 - Flow-Capacity Rating and Application of Suction-Line Filters and Filter Dryers.
4. ARI 750 - Thermostatic Refrigerant Expansion Valves.
5. ARI 760 - Solenoid Valves for Use with Volatile Refrigerants.

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
   1. ASHRAE 15 - Safety Code for Mechanical Refrigeration.

C. American Society of Mechanical Engineers:
   1. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
   2. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
   3. ASME B31.5 - Refrigeration Piping.
   4. ASME Section VIII - Boiler and Pressure Vessel Code - Pressure Vessels.

D. ASTM International:
   1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
   2. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
   3. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
   4. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
   5. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
   6. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.

E. American Welding Society:
   1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.
   2. AWS D1.1 - Structural Welding Code - Steel.

F. Manufacturers Standardization Society of the Valve and Fittings Industry:
   1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
   2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
   3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

G. Underwriters Laboratories Inc.:
   1. UL 429 - Electrically Operated Valves.

1.4 SYSTEM DESCRIPTION

A. Where more than one piping system material is specified, provide compatible system components and joints. Use non-conducting dielectric connections when joining dissimilar metals in systems.

B. Provide flanges, unions, or couplings at locations requiring servicing. Use unions, flanges, or couplings downstream of valves and at equipment connections. Do not use direct welded or threaded connections to valves or equipment.

C. Provide pipe hangers and supports in accordance with ASME B31.5, MSS SP 58, MSS SP 69, and MSS SP 89.

D. Provide receivers on systems with piping runs exceeding 50 feet.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate layout of refrigeration piping system, including equipment, critical dimensions, and sizes.

C. Product Data:
   1. Piping: Submit data on pipe materials, fittings, and accessories.
   2. Valves: Submit manufacturers catalog information with valve data and ratings for each service.
   3. Hangers and Supports: Submit manufacturers catalog information including load capacity.
   4. Refrigerant Specialties: Submit manufacturers catalog information including capacity, component sizes, rough-in requirements, and service sizes for the following:
      a. Refrigerant moisture and liquid indicators.
      b. Refrigerant strainers.
      c. Refrigerant pressure regulators.
      d. Refrigerant pressure relief valves.
      e. Refrigerant filter-driers.
      f. Refrigerant solenoid valves.
      g. Refrigerant expansion valves.
      h. Electronic expansion valves.

D. Design Data: Indicate pipe size. Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.

E. Test Reports: Indicate results of refrigerant leak test piping system pressure test.

F. Manufacturer's Installation Instructions: Submit hanging and support methods, joining procedures and isolation.

G. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

H. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of valves, equipment and refrigerant accessories.

B. Operation and Maintenance Data: Submit instructions for installation, changing components and exploded assembly views.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Perform Work in accordance with ASME B31.5 code for installation of refrigerant piping systems.

C. Perform Work in accordance with NYCBC, NYCMC for welding hanger and support attachments to building structure.

D. Perform Work in accordance with NYCBC.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Fabricator or Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience, properly trained by manufacturer.

C. Coordinate piping system, hangers and supports under direct supervision of the Commissioner. Layout and sizing of piping must be approved by the manufacturer.

1.9 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.10 DELIVERY, STORAGE AND HANDLING

A. Dehydrate and charge refrigeration components including piping and receivers, seal prior to shipment. Maintain seal until connected into system.

B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Do not install underground piping when bedding is wet or frozen.

1.12 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 REFRIGERANT PIPING

A. Copper Tubing: ASTM B280, Type ACR hard drawn or annealed.
   1. Fittings: ASME B16.22 wrought copper.
   2. Joints: Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy with melting range 1190 to 1480 degrees F.

B. Steel Pipe: ASTM A53/A53M, Grade B, Schedule 40, black for all refrigerant relief vent piping.
   1. Fittings: ASTM A234/A234M forged steel welding type.
   2. Joints: Welded.

2.2 UNIONS, FLANGES AND COUPLINGS

A. 2 inches and Smaller:
   1. Ferrous Piping: 450 psig malleable iron, threaded.
   2. Copper Pipe: Bronze, soldered joints.

B. 2-1/2 inches and Larger:
   1. Ferrous Piping: 450 psig forged steel, slip-on.
   2. Copper Piping: Bronze.
   3. Gaskets: 1/16 inch thick preformed neoprene.

C. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.3 PIPE HANGERS AND SUPPORTS

A. Reference Section 23 05 29 for support requirements.

2.4 REFRIGERANT MOISTURE AND LIQUID INDICATORS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Alco Controls Div., Emerson Electric Co.
   2. Parker Hannifin Corp., Refrig. & Air Cond. Div. Model.
   3. Sporlan Valve Co. Model.
   4. Or approved equal.

B. Indicators:
   1. Port: Single, UL listed.
   2. Body: Copper or brass, flared or solder ends.
   3. Sight glass: Color-coded paper moisture indicator with removable element cartridge and plastic cap.
   4. Maximum working pressure: 500 psig
   5. Maximum working temperature: 200 degrees F.

2.5 VALVES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Alco Controls Div., Emerson Electric Co.
   2. Parker Hannifin Corp., Refrig. & Air Cond. Div.
   3. Sporlan Valve Co.
   4. Or approved equal.

B. Diaphragm Packless Valves:
   1. UL listed, globe or angle pattern, forged brass body and bonnet solder or flared ends.
   2. Phosphor bronze and stainless steel diaphragms, rising stem and hand wheel.
   3. Stainless steel spring, nylon seats, disc with positive back seating.

4. Maximum working pressure: 500 psig.
5. Maximum working temperature: 275 degrees F.

C. Packed Angle Valves:
1. Forged brass, solder or flared ends.
2. Forged brass seal caps with copper gasket, rising stem and seat with back seating, molded stem packing.
3. Maximum working pressure: 500 psig.
4. Maximum working temperature: 275 degrees F.

D. Ball Valves:
1. Two-piece bolted forged brass body with teflon ball seals and copper tube extensions, brass bonnet and seal cap, chrome plated ball, stem with neoprene ring stem seals, soldered or threaded ends.
2. Maximum working pressure: 500 psig.
3. Maximum working temperature: 300 degrees F.

E. Service Valves:
1. Forged brass body with copper stubs, brass caps, removable valve core, integral ball check valve, flared or solder ends.
2. Maximum working pressure: 500 psig.

F. Refrigerant Check Valves:
1. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   a. Alco Controls Div, Emerson Electric Co.
   b. Parker Hannifin Corp., Refrig. & Air Cond. Div.
   c. Sporlan Valve Co. Model.
   d. Or approved equal.
2. Globe Type:
   a. Cast bronze or forged brass body, forged brass cap with neoprene seal, brass guide and disc holder, phosphor-bronze or stainless steel spring, teflon seat disc.
   b. Maximum working pressure: 500 psig.
   c. Maximum working temperature: 300 degrees F.
3. Straight Through Type:
   a. Spring, neoprene seat.
   b. Maximum working pressure: 500 psig.
   c. Maximum working temperature: 200 degrees F.

2.6 REFRIGERANT STRAINERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Alco Controls Div., Emerson Electric Co.
2. Parker Hannifin Corp., Refrig. & Air Cond. Div.
3. Sporlan Valve Co.
4. Or approved equal.

B. Straight Line or Angle Line Type:
1. Brass or steel shell, steel cap and flange, and replaceable cartridge, with screen of stainless steel wire or monel reinforced with brass.

2. Maximum working pressure: 450 psig.

C. Straight Line, Non-Cleanable Type:
1. Steel shell, copper plated fittings, stainless steel wire screen.
2. Maximum working pressure: 500 psig.

2.7 REFRIGERANT PRESSURE REGULATORS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Alco Controls Div., Emerson Electric Co.
2. Parker Hannifin Corp., Refrig. & Air Cond. Div.
3. Sporlan Valve Co.
4. Or approved equal.

B. Brass body, stainless steel diaphragm, direct acting, adjustable over 0 to 80 psig range, for maximum working pressure of 450 psig.

2.8 REFRIGERANT PRESSURE RELIEF VALVES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Alco Controls Div., Emerson Electric Co.
2. Parker Hannifin Corp., Refrig. & Air Cond. Div.
3. Sporlan Valve Co.
4. Or approved equal.

B. Straight Through or Angle Type: Brass body and disc, neoprene seat, factory sealed and stamped with ASME UV and National Board Certification NB; for standard 450 psig setting; selected to ASHRAE 15.

2.9 REFRIGERANT FILTER-DRIERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Alco Controls Div., Emerson Electric Co.
2. Parker Hannifin Corp., Refrig. & Air Cond. Div.
3. Sporlan Valve Co.
4. Or approved equal.

B. Replaceable Cartridge Angle Type:
1. Shell: ARI 710, UL listed, brass removable cap, for maximum working pressure of 500 psig.

C. Permanent Straight Through Type:
1. ARI 710, UL listed, steel shell with molded desiccant filter core, for maximum working pressure of 500 psig.

2.10 REFRIGERANT SOLENOID VALVES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Alco Controls Div., Emerson Electric Co.
2. Parker Hannifin Corp., Refrig. & Air Cond. Div.

3. Sporlan Valve Co.
4. Or approved equal.

B. Valve: ARI 760, pilot operated, copper or brass or steel body and internal parts, synthetic seat, stainless steel stem and plunger assembly, integral strainer, with flared, solder, or threaded ends; for maximum working pressure of 500 psig. Stem designed to allow manual operation in case of coil failure.

C. Coil Assembly: UL 429, UL listed, replaceable with molded electromagnetic coil, moisture and fungus proof, with surge protector and color-coded lead wires, integral junction box with pilot light.

D. Electrical Characteristics: 120 volts.

2.11 REFRIGERANT EXPANSION VALVES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Alco Controls Div., Emerson Electric Co.
2. Parker Hannifin Corp., Refrig. & Air Cond. Div.
3. Sporlan Valve Co.
4. Or approved equal.

B. Angle or Straight Through Type: ARI 750; design suitable for refrigerant, brass body, internal or external equalizer, bleed hole, mechanical pressure limit (maximum operating pressure MOP feature), non-adjustable superheat setting, replaceable inlet strainer, with replaceable capillary tube and remote sensing bulb and remote bulb well.

C. Selection: Evaluate refrigerant pressure drop through system to determine available pressure drop across valve. Select valve for maximum load at design operating pressure and minimum 10 degrees F superheat. Select to avoid being undersized at full load and oversized at part load.

2.12 ELECTRONIC EXPANSION VALVES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Alco Controls Div., Emerson Electric Co.
2. Parker Hannifin Corp., Refrig. & Air Cond. Div.
3. Sporlan Valve Co.
4. Or approved equal.

B. Valve:
1. Brass bodies with flared or solder connection, needle valve with floating needle and machined seat, stepper motor drive.
2. Electrical Characteristics: 12 VA, 12 volts DC.

C. Evaporation Control System:
1. Electronic microprocessor-based unit in enclosed case, proportional integral control with adaptive superheat, maximum operating pressure function, pre-selection allowance for electrical defrost and hot gas bypass.
2. Electrical Characteristics: 12 VA, 115 volts, single phase, 50/60 Hz.

D. Refrigeration System Control: Electronic microprocessor-based unit in enclosed case, with proportional integral control of valve, on/off thermostat, air temperature alarm (high and low), solenoid valve control, liquid injection adaptive superheat control, maximum operating pressure function, night setback thermostat, timer for defrost control.

2.13 REFRIGERANT RECEIVERS

A. Internal Diameter 6 inch and Smaller: ARI 495, UL listed, steel, brazed; 450 psig maximum pressure rating, with taps for inlet, outlet, and pressure relief valve.

B. Internal Diameter 6 inch and Larger: ARI 495, welded steel, tested and stamped in accordance with ASME Section VIII; 450 psig with taps for liquid inlet and outlet valves, pressure relief valve, and magnetic liquid level indicator.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Ream pipe and tube ends. Remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment with flanges or unions.

D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.3 REFRIGERANT SIZING

A. Submit manufacturer’s computerized calculations in accordance with ASHRAE procedures to confirm pipe sizes.

3.4 INSTALLATION - INSERTS

A. Reference Section 23 05 29 for support requirements.

3.5 INSTALLATION - PIPE HANGERS AND SUPPORTS

A. Reference Section 23 05 29 for support requirements.

3.6 INSTALLATION - ABOVE GROUND PIPING SYSTEMS

A. Route piping parallel to building structure and maintain gradient.

B. Install piping to conserve building space, and not interfere with use of space.

C. Group piping whenever practical at common elevations.

D. Sleeve pipe passing through partitions, walls and floors. Refer to Section 23 05 29.

E. Install pipe identification in accordance with Section 23 05 53.

F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

G. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors with Section 08 31 00.

H. Arrange refrigerant piping to return oil to compressor. Provide traps and loops in piping, and provide double risers as required. Slope horizontal piping 0.40 percent in direction of flow.

I. Flood refrigerant piping system with nitrogen when brazing.

J. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.

K. Prepare unfinished pipe, fittings, supports, and accessories, ready for finish painting. Refer to Section 09 90 00.

L. Install valves with stems upright or horizontal, not inverted.

M. Insulate piping and equipment; refer to Section 23 07 00.

N. Provide replaceable cartridge filter-dryers, with isolation valves and bypass with valve.

O. Locate expansion valve sensing bulb immediately downstream of evaporator on suction line.

P. Provide external equalizer piping on expansion valves with refrigerant distributor connected to evaporator.

Q. Install flexible connectors at right angles to axial movement of compressor, parallel to crankshaft.

R. Provide electrical connection to solenoid valves. Refer to Division 26.

S. Fully charge completed system with refrigerant after testing.

T. Follow ASHRAE 15 procedures for charging and purging of systems and for disposal of refrigerant.

U. Install refrigerant piping in accordance with ASME B31.5.

3.7 INSTALLATION - REFRIGERANT SPECIALTIES

A. Refrigerant Liquid Indicators:
   1. Install line size liquid indicators in main liquid line downstream of condenser.
   2. When receiver is provided, install line size liquid indicators in liquid line downstream of receiver.
   3. Install line size liquid indicators downstream of liquid solenoid valves.

B. Refrigerant Valves:
   1. Install service valves on compressor suction and discharge.
   2. Install gage taps at compressor inlet and outlet.
   3. Install gage taps at hot gas bypass regulators, inlet and outlet.
   4. Install check valves on compressor discharge.
   5. Install check valves on condenser liquid lines on multiple condenser systems.
   6. Install refrigerant charging valve in liquid line between receiver shut-off valve and expansion valve.

C. Strainers:
   1. Install line size strainer upstream of each automatic valve.
   2. Where multiple expansion valves with integral strainers are used, install single main liquid-line strainer.
   3. On steel piping systems, install strainer in suction line.
   4. Install shut-off valves on each side of strainer.

D. Install pressure relief valves on ASME receivers. Install relief valve discharge piping to terminate outdoors.

E. Filter-Dryers:
   1. Install permanent filter-dryers in low temperature systems.
   2. Install permanent filter-dryer in systems containing hermetic compressors.
   3. Install replaceable cartridge filter-dryer vertically in liquid line adjacent to receivers.
   4. Install replaceable cartridge filter-dryer upstream of each solenoid valve.

F. Solenoid Valves:
   1. Install in liquid line of systems operating with single pump-out or pump-down compressor control.
   2. Install in liquid line of single or multiple evaporator systems.
   3. Install in oil bleeder lines from flooded evaporators to stop flow of oil and refrigerant into suction line when system shuts down.

3.8 FIELD QUALITY CONTROL

A. Test refrigeration system in accordance with ASME B31.5.

B. Pressure test refrigeration system with dry nitrogen to 1.3 times working pressure. Perform final tests at 27 inches vacuum and working pressure using electronic leak detector.

C. Repair leaks.

D. Retest until no leaks are detected.

END OF SECTION 23 23 00

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SECTION 23 31 00 - HVAC DUCTS AND CASINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
1. Duct Materials.
2. Insulated flexible ducts.
3. Casings.
4. Ductwork fabrication.
5. Duct cleaning.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Product requirements for concrete for placement by this section.
2. Section 09 90 00 - Painting and Coating: Execution requirements for Weld priming, weather resistant, paint or coating specified by this section.
3. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment: Product requirements for hangers, supports and sleeves for placement by this section.
4. Section 23 33 00 - Air Duct Accessories: Product requirements for duct accessories for placement by this section.

1.3 REFERENCES

A. ASTM International:
1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. ASTM A90/A90M - Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
3. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
4. ASTM A568/A568M - Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
5. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
6. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
8. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
9. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. National Fire Protection Association:
   1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.
   2. NFPA 90B - Standard for the Installation of Warm Air Heating and Air Conditioning Systems.
   3. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

C. Sheet Metal and Air Conditioning Contractors:
   1. SMACNA - HVAC Air Duct Leakage Test Manual.
   2. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

D. Underwriters Laboratories Inc.:
   1. UL 181 - Factory-Made Air Ducts and Connectors.

E. National Air Duct Cleaners Association
   1. NADCA Standards for duct cleaning.

1.4 PERFORMANCE REQUIREMENTS

A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Submit duct fabrication drawings, drawn to scale not smaller than 3/8 inch equals 1 foot, on drawing sheets same size as Contract Documents, indicating:
   1. Fabrication, assembly, and installation details, including plans, elevations, sections, details of components, and attachments to other work.
   2. Duct layout, indicating pressure classifications and sizes in plan view. For exhaust duct systems, indicate classification of materials handled as defined in this section.
   3. Fittings.
   4. Reinforcing details and spacing.
   5. Seam and joint construction details.
   6. Penetrations through fire rated and other walls.
   7. Hangers and supports, including methods for building attachment, vibration isolation, and duct attachment.
   8. Submit shop drawings indicating duct runs, material, extent of internal lining, fire dampers, volume dampers access doors and elevation of all ducts.
   9. Also submit a book of Shop Standards for Sheetmetal Fabrication, for approval, before starting fabrication of any portion of ductwork.

C. Product Data: Submit data for duct materials, duct liner and duct connectors.

D. Samples: Submit two (2) samples of typical shop fabricated duct fittings.

E. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and flexible.

C. Maintain one (1) copy of each document on site.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience properly trained by manufacturer.

1.9 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.

B. Maintain temperatures during and after installation of duct sealant.

1.11 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 DUCT MATERIALS

A. Galvanized Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock-forming quality, having G90 zinc coating of in conformance with ASTM A90/A90M.

B. Aluminum Ducts: ASTM B209; aluminum sheet, alloy 3003-H14. Aluminum Connectors and Bar Stock: Alloy 6061-T6 or of equivalent strength.

C. Fasteners: Rivets, bolts, or sheet metal screws.

D. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.2 CASINGS/PLENUMS

A. Fabricate casings in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and construct for operating pressures indicated.

B. Reinforce access door frames with steel angles tied to horizontal and vertical plenum supporting angles. Furnish hinged access doors where indicated or required for access to equipment for cleaning and inspection.

C. Provide all metal housing, casings or plenums. Metal casings or plenums must be constructed and jointed by external 1-1/2" standing seams of No. 16 USS gauge galvanized steel sheets, reinforced with 1-1/2" x 1-1/2" x 1/4" angles spaced not more than 3'-0" apart. Additional angles must be provided wherever necessary to prevent vibration.

D. Bottom panels must be constructed to form watertight pans not less than 6" deep, with brass drains with strainers and threaded outlets located in each compartment where required. The bottom of each compartment must be pitched to the drain. Provide water seal in drain lines to carry lines to nearest indirect drain.

E. Casing or plenums must be provided with steel supports, of type approved by the Commissioner to properly support the equipment and to maintain pitch to the drains. Where insulated, they must be arranged with adequate means of attaching the insulation, including the bottom, if any.

F. The Contractor must provide heavy rigid plates with all required drilling and cutouts, heavy braced to reduce vibration, for the installation of thermometers, thermostats and other instruments.

G. Longitudinal reinforcing angles must be installed on the inside in accordance with the following schedule:

Height of Side				Diagonal Bracing
Walls or Width of Roof	No. Angles	Angle Spanning	Length of Casing	Pairs of Braces
Up to 6'	0	-	Any	None
Up to 8'	1	Middle	Any	None
8' to 12'	2	1/3 points	Any	None
Over 12'	Variable	4' Centers	3&4 Panels	1
			5&6 Panels	2
			7&8 Panels	3

1. Angle size must be 1-1/2" x 1-1/2" x 1/8" to 12' casing length, and 1-1/2" x 1/2" x 3/16" over 12' casing length.
   a. Note: Provide knee-bracing for top of casing wherever required.

H. All joints must be caulked with Minnesota Mining Formula EC 1057, Alumastic, 3M or approved equal to make them airtight.

I. Casing or plenums must be supported on galvanized steel legs. The bottom at the floor and at any other connection to masonry must be riveted to 1-1/2" x 1-1/2" x 1/8" galvanized steel angles which must be secured to masonry with expansion shields and caulked tight with cement.

J. Provide angles above and below access doors and frames for access doors.

2.3 DOUBLE WALL PLENUMS

A. General:
1. Double-wall (insulated) pressurized plenum equipment enclosures must be provided for all mixed air, return air and supply air discharge plenums. All panels and components must be prefabricated and supplied by a nationally recognized manufacturer with published standards of construction, assembly and technical performance. The manufacturer must have produced a standardized prefabricated panel system for at least 10 years. Construction and performance of the installed system and components must conform to all specifications listed in this document. The system and components must not be susceptible to damage from extended exposure to airflow, pressure differentials, vibration, air temperature or humidity.

B. Joint Construction:
1. Panels must be of "snap-lock" construction, such that adjacent panels are held together rigidly with an integral, continuous self-locking joint on both inside and outside panel surfaces. These joints must not require screws, H-connectors, tape or any other type of additional fasteners or connectors.
2. For plenums in contact with air having temperature less than 60°F. during the summer, thermal break joints must be provided.

C. Panel Construction:
1. All panels must be 4 inches thick, with a solid galvanized steel exterior shell, and a perforated interior galvanized steel shell.
2. The outer and inner shells must be tack or spot welded to perimeter and internal longitudinal steel channels and box-end internal closures, in such a manner and spacing that the panel assembly will not fail at the maximum operating loads specified in the Structural Performance specifications given in this document.
3. The outer shell must be constructed of galvanized steel with a minimum 20-gauge thickness.
4. The inner must be constructed of galvanized steel with a minimum 22-gauge thickness.
5. Perforated materials must be 3/32-inch-diameter round holes with staggered spacing, 3/16 inch on center. The perforated material must have a 23 percent open area.
6. All perimeter and internal longitudinal steel channel members must be constructed of ASTM Type A-446 structural quality galvanized steel with a minimum 18-gauge thickness of ASTM Type A-526 commercial-quality galvanized steel with a minimum 16-gauge thickness.
7. All steel panel surfaces, internal channels, and trim items must be fabricated from zinc-coated steel with a hot-dipped galvanized coating (minimum G-90 coating class as determined by ASTM A-525) and must meet all requirements of ASTM A-526 for commercial-quality galvanized carbon steel.
8. Each panel assembly must be completely filled with acoustical/thermal insulating material that is non-combustible, inert, mildew-resistant and vermin-proof. Insulation must not settle within the panel assembly. No insulating materials will be used that have a flame spread greater than 25 or a smoke developed greater than 50.

D. Components and Installation:

1. All plenum base channels must be installed on a level concrete curb, the dimensions of which will be determined from plan-view shop drawings of the system provided by the system manufacturer. Spacing of base channel attachments must be as outlined in the manufacturer's standard details of assembly.
2. All assembly trim items must be constructed of hot-dipped galvanized steel (minimum 18-gauge thickness) and furnished in standard lengths to be field cut to the required dimensions. Spacing of sheet metal screws, application of duct sealant and positioning of trim must be in accordance with the plenum manufacturer's published erection and installation details.
3. All mechanical joints and external trim items must be sealed with a UL-Classified duct sealant in accordance with manufacturer's recommendations. In order to show that joints have been sealed properly, enough sealant must be used to that excess sealant is extruded from all completed external joints.
4. For enclosures to be installed indoors, joints and trim must be sealed with a solvent-based duct sealant that is a polymeric rubber formulated to withstand temperatures from -20 to +150°F. Sealant must be formulated such that surface preparation or solvent cleaning is not necessary. Sealant must have a UL Classification marking with a flame spread of 15 and smoke developed of 20 when applied to 18-gauge galvanized steel and a flame spread of 10 and smoke developed of 0 when applied to organic reinforced cement board, both at a coverage of 31 square feet per gallon. Sealant must exceed 750 hours without becoming brittle under ASTM-D572 test conditions (oxygen bomb).
5. For enclosures to be installed indoors and outdoors, joints and trim must be sealed with a solvent-based duct sealant that is a neoprene-phenolic mastic formulated to withstand temperatures from 02- to +300°F. Sealant must be formulated such that surface preparation or solvent cleaning is not necessary. Sealant must have a UL Classification marking with a flame spread of 5 and smoke developed of 0 when applied to 18-gauge galvanized steel and a flame spread of 5 and smoke developed of 5 when applied to inorganic reinforced cement board, both at a coverage of 53 square feet per gallon. Sealant must exceed 1,000 hours under ASTM-D572 test conditions (oxygen bomb) without becoming brittle under 500 hours in QUV accelerated-exterior-aging apparatus without degradation (under ASTM-C732 test conditions).
6. Personnel access doors must be provided where specified on drawings and must be 24 inches wide by 60 inches high unless otherwise indicated. All doors must be the same nominal thickness as the prefabricated standard door panel in which they are mounted. All access door panels and doors must be constructed with a solid inner and outer shell (minimum 20-gauge thickness). Each door must be installed in the door panel at the factory and have a minimum of two ball-bearing hinges and two wedge-lever door latches. All levers must be operable from the interior and exterior sides of the door panels. All doors must be installed to open against the air pressure differential. Doors must seat against neoprene gasket materials, installed around the entire perimeter of the door frame in such a manner that door operation will provide direct compression with no sliding action between the door and gasket.
7. Doors must be furnished with windows, which are composed of double-glazed layers of wire-reinforced safety-glass, separated by an air space, and sealed against acoustical and air leakage by interior and exterior rubber seals.
8. Openings for pipe and conduits must be field cut to ensure proper positioning. All framing members, collars and bellmouth fittings must be insulated, welded and sealed according to the plenum manufacturer's published installation details.

E. Structural Performance:
   1. The entire plenum installation must be designed by the plenum manufacturer to be self-supporting. Where roof spans and wall loadings require additional structural strength, it must be provided by

heavier panel skins, additional internal longitudinal reinforcing members or additional structural members and necessary supporting pipe columns. The installer must furnish and install all structural members and pipe columns according to the drawings and published installation details provided by the plenum manufacturer.

2. The finished plenum installation must be above to withstand a positive internal static pressure of 6 inches w.g. and a negative internal static pressure of 6 inches w.g. Installations subjected to the effects of weather must be able to withstand a wind loading of 100 pounds per square foot.
3. Under the conditions specified in the previous section, the assembled structure must not exhibit any panel joint deflections in excess of L/200, where L is the unsupported span length of any panel section within the completed plenum.

F. Acoustical Performance:

1. The plenum manufacturer must provide certified testing data obtained from an acoustical laboratory, listing sound absorption and transmission loss characteristics of the panel assembly. When requested by the Commissioner, the plenum manufacturer must arrange to have a copy of all pertinent acoustical laboratory reports forwarded directly from the laboratory to the Commissioner.
2. When tested according to ANSI/ASTM C423-66 or a subsequent version of this standard, the panel assembly must have minimum sound absorption coefficients, as shown in the following table, in the 1/3 octave band center frequencies. The coefficients used must be those reported by the acoustical laboratory.

Sound Absorption Coefficients 1/3 Octave Band							
Center Frequency (Hz)	125	250	500	1000	2000	4000	NEC
	0.63	1.09	1.17	1.08	1.03	0.97	1.00

3. When tested according to ANSI/ASTM E90-70 or a subsequent version of this standard, the panel assembly must have minimum airborne sound transmission losses, as shown in the following table, in the combined full octave band center frequencies.

Sound Transmission Losses Octave Band							
Center Frequency (Hz)	125	250	500	1000	2000	4000	8000
	16	24	35	45	53	58	37

G. Thermal Performance:

1. Insulating materials used in all prefabricated panel assemblies must have the following maximum thermal conductance at a mean temperature of 75°F: 0.06 Btu per hour per square foot per degree Fahrenheit.

2.4 ACCESS DOORS FOR CASING AND PLENUMS

A. Access doors not less than 20" x 48" must be provided in equipment casings and plenums. They must consist of No. 16 USS gauge galvanized steel sheets mounted on angle frames with crossbracing to prevent sagging or warping, and must have sponge rubber gaskets.

B. Door must be installed on angle or channel frames, extended where required to finish flush with insulation. In insulated casings, the doors must be of double construction, filled with insulation 1" thick. Door openings in casings must have angle frames to provide a true and uniform seating surface for the gasketed doors.

C. Each door must be equipped with three (3) 6-screw "T" shaped extra heavy zinc plated hinges with brass pins. Provide three (3) cast zinc lever type fasteners. Inside release levers must be provided for each door.

2.5 INSULATED PANELS

A. Provide insulated panels for all spaces to be blanked off inside fan housings and for unused portions of louvers and where noted on the drawings.

B. Inside and outside sheets of panels must be constructed of alloy 25 hard aluminum sheet 20 B & S gauge. Insulation must be 1-1/2 inches thick polyurethane.

C. Sections over 24 inches long must be internally braced with inside Z-bars.

D. Panels must be assembled and installed in such a manner as to be completely airtight and rigid.

2.6 DUCTWORK FABRICATION

A. Fabricate and support rectangular ducts in accordance with NYCBC, NYCMC, NFPA 96 and SMACNA HVAC Duct Construction Standards - Metal and Flexible. Provide duct material, gages, reinforcing and sealing for operating pressures indicated.

B. Ductwork must be continuous, be built with joints and seams presenting a smooth surface on the inside and neatly finished on the outside. All joints and seams for supply, exhaust, make-up and return air ductwork must be sealed airtight with approved non-hardening resilient caulking compound. "Airtight" means duct leakage not exceeding 5% of design air quantity. Should duct leakage exceed this limit, Contractor must reseal as required and rebalance systems at no cost to the City of New York. All ductwork must be sealed with high pressure duct sealant. Seal Class A, as defined by SMACNA, must be provided for all ductwork.

C. Ductwork is exposed to view and considered an architectural component of the project. External tapes are not allowed and sealants/welds must be finished in a workmanlike manner. All welding burns must be filed and scraped clean. Excess sealants and filler material must be removed. Duct supports must have a finished appearance.

D. Refer to Section 23 05 48 for Noise and Vibration Controls for HVAC Piping and Equipment.

E. Fabricate ducts having pressure class equal to or greater than the static pressure of the fans or equipment to which the duct is connected.

F. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation.

G. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream unless noted otherwise.

H. Provide standard 45-degree lateral wye takeoffs. When space does not allow 45-degree lateral wye takeoff, use 90-degree conical tee connections.

2.7 HANGERS AND SUPPORTS

A. Where hanger straps are used, they must be 1" x 18 ga. minimum, galvanized steel.

B. Rectangular duct risers must be supported at each floor by angles or channels secured to the sides of the duct with welds, bolts, sheet metal screws or blind rivets.

C. Ducts over 60 inches wide must be suspended on a trapeze type hanger. The duct must not be secured to the hanger.

D. Hanger spacing must vary between 4 ft. and 8 ft. depending on duct size and distance between construction joints, such that, 4 ft. sections must be supported every 4 ft.

E. Provide inserts, fishplates and other methods recommended by SMACNA, and as approved, for supporting hanger straps and trapeze hangers. Do not use or submit power actuated fasteners, expansion nails or pins for supporting duct hangers.

2.8 DUCT SEALANTS

A. Use the following sealants for joints and seams and for acoustic lining and vapor barrier application to all ductwork unless called for otherwise:

1. Foster #32-19, Childers CP-146, Design Polymerics DP 1015 or approved equal for sealing high and low pressure ductwork.
2. 3M-425, JVCC AF30-SW, Polyken 345 or approved equal for taping joints in vapor-proof barriers.
3. Foster #85-20/85-60, Childers CP-127, Design Polymerics DP 2501 or approved equal for attaching acoustic lining.
4. Foster #30-36, Childers CP-50AMV1, Design Polymerics DP 3050 or approved equal for binding edges on acoustic lining
5. Foster #30-65, Childers CP-35, Design Polymerics DP 3040 or approved equal as a vapor barrier coating on insulation

B. Use equivalent sealants if any of the above cannot provide flame spread rating of 25 and smoke developed rating 50 or less.

C. Duct sealants and adhesives must meet all N.Y.S. Part 205-VOC requirements for applications outlined herein and comply with low V.O.C. requirements as stated in Section 01 8 13.13 of the DDC General Conditions.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify sizes of equipment connections before fabricating transitions.

3.3 INSTALLATION

A. Install and seal ducts in accordance with NYCBC, NYCMC, NFPA 96 and SMACNA HVAC Duct Construction Standards - Metal and Flexible. All seams and joints must be sealed to meet SMACNA Seal Class A.

B. During shipping, storage on-site and throughout construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system throughout the entire fabrication and installation process.

C. Provide internally insulated (lined) ductwork in accordance with Section 23 05 48, Noise and Vibration Controls for HVAC Piping and Equipment.

D. Use crimp joints with beaded sleeve couplings for joining round duct sizes 8 inch and smaller. Use flanged joints for ducts larger than 8 inches.

E. Install duct hangers and supports in accordance with Section 23 05 29.

F. Use double nuts and lock washers on threaded rod supports.

G. Set plenum doors 6 to 12 inches above floor. Arrange door swing so fan static pressure holds door in closed position.

H. Casings: Install floor-mounted casings on 4-inch-high concrete curbs. Refer to Section 03 30 00. At floor, rivet panels on 8-inch centers to angles. Where floors are acoustically insulated, furnish liner of 18 gage galvanized expanded metal mesh supported at 12-inch centers, turned up 12 inches at sides with sheet metal shields.

I. Coordinate with all affected trades to ensure that no ceilings, equipment or other materials other than as specifically provided herein are supported from ductwork or the ductwork hanger system.

J. Coordinate with other trades as necessary to ensure that access doors have been provided in hung ceilings, shaft wall, or other construction, of ample size for proper operation and maintenance of the installation.

K. While the drawings must be adhered to as closely as possible, the right is reserved to vary the run and size of ducts during the progress of the work if required to meet structural conditions.

L. Sheet metal sub-contractor must install all ductwork in strict adherence to the ceiling height schedules indicated on the drawings. Sheet metal sub-contractor must consult with the Heating, Fire Protection, Electric and Plumbing sub-contractors and must establish the necessary space requirements for each trade. The sheet metal ductwork must, whether indicated or not, rise and/or drop and/or change in shape to clear any and all conduits, lighting fixtures, sprinklers, plumbing and heating piping to maintain the desired ceiling heights.

M. Transition pieces from rectangular to round at fan discharge must be 16 gauge all-welded construction. Provide suitable angle reinforcement. Branches off medium and high pressure duct mains must have conical taps.

N. Provide watertight stainless steel or copper counter flashings around all ducts passing through openings in exterior wall or through roof.

O. Provide a fire damper and sheetmetal sleeve for each duct penetration through fire rated walls. Wherever ducts penetrate Mechanical Equipment Room walls, floor and ceiling slabs, and no fire smoke or fire damper is required, the entire space between duct and wall sleeve or slab opening must be tightly packed with approved soundproof material. Each face of opening must further be caulked airtight with approved non-hardening resilient caulking.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Install openings in ductwork where required to accommodate thermometers and controllers. Install pitot tube openings for testing of systems. Install pitot tube complete with metal can with spring device or screw to prevent air leakage. Where openings are provided in insulated ductwork, install insulation material inside metal ring.

B. Connect diffusers to low pressure ducts with 18 inches maximum length of flexible duct held in place with strap or clamp.

C. Connect air outlets and inlets to supply ducts with 18 inches maximum length of flexible duct. Do not use flexible duct to change direction.

3.5 DUCT PRESSURE TEST

A. Pressure Testing of Ductwork
   1. Air pressure testing during erection must include separate air leakage tests of plenum, the horizontal distribution system ductwork and, after all ductwork is installed and the central station apparatus is erected, leakage testing of the entire System. The testing must apply to all ductwork in systems constructed to 3" w.g. or higher pressure classes.
   2. Test all ductwork at corresponding pressure class to which it is constructed. Duct leakage must be limited to the following:

Average Size of Run Diameter or Equivalent	100 ft. Run (A	B)
12 inches or less	10	1"
20 inches or less	15	2"
30 inches or less	25	6"

Average Size of Run Diameter or Equivalent	100 ft. Run (A	B)
40 inches or less	30	9"
50 inches or less	30	9"

(A) Permissible loss in cfm.
(B) Corresponding differential gauge reading (0.875 inch diameter orifice plate).

3. Tests must be made prior to insulation of system being tested using suitable test equipment including test blower, "U" tube, orifice, tubing and cocks, arranged to indicate the amount of air leakage.
4. The leakage tests of the ductwork must be made with pressure in the system, obtained by operation of the test blower.
5. All joints must be inspected and checked for audible leakage, repaired if necessary and retested.
6. Contractor must test ductwork using SMACNA leakage test methods to limit amount of leakage per sq. ft. of ductwork prescribed for Leakage Class 6 or 6" WG Duct Design.

3.6 CLEANING

A. Scope of Work:
1. Contractor must provide all labor, materials, facilities, equipment and services to thoroughly clean HVAC system including all supply air and exhaust ductwork, associated air devices, turning vanes, dampers, reheat coils, etc. Contractor must remove, store and re-install ceiling tiles as required for access to systems. Contractor must provide and install duct access doors as required for proper access. Contractor must repair or replace all damaged ceiling tiles, wall penetrations, ceiling penetrations, floor penetrations, insulation, control components or other damaged items to match existing.
2. Determine cleaning method to prevent damage to existing systems. Notify the Commissioner of proposed method and impact on system prior to start. Also notify the Commissioner of any system defects discovered during cleaning process.

B. Clean duct systems with high power vacuum machines. Protect equipment with potential to be harmed by excessive dirt with filters, or bypass during cleaning. Install access openings into ductwork for cleaning purposes.

C. The duct system must be inspected and certified by an air system cleaning specialist, member of NADCA, to confirm that it meets all NADCA standards.

3.7 CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN

A. The Contractor must incorporate all protective measures as required to prevent the contamination of the duct system and air distribution system. Air pollutants as described in the “SMACNA-IAQ Guidelines for Occupied Buildings Under Construction” Tables 2-2 and 2-3 must be prevented from entering the duct system and air distribution system. Preventative measures including, but not limited to the following, must be incorporated:
1. All stored ductwork and air distribution equipment must be kept dry and clean.
2. Sealing of all ductwork and louvers prior to finish cleaning of building.
3. Utilization of temporary filters.
4. Sealing of fans, fan coil units, etc.

5. Duct and equipment cleaning.
6. Provisions for temporary construction exhaust fans to remove dust, odors, etc.
7. HVAC protection as defined in Chapter 3 of the above noted SMACNA manual.
8. Source control as defined in the above noted SMACNA manual.
9. Pathway interruption as defined in the above noted SMACNA manual.
10. Housekeeping as defined in the above noted SMACNA
11. Scheduling as defined in the above noted SMACNA manual.

B. It is the intent that the permanent HVAC systems will not be used for temporary heating and cooling. Provide temporary heating and cooling as required to meet construction requirements.

C. After final cleaning of HVAC system and building, the system must be flushed with 100% outdoor air for a two-week time period in accordance with ASHRAE Standard 62.

3.8 SCHEDULES

A. Ductwork Material Schedule:

AIR SYSTEM	MATERIAL
Supply	Galvanized Steel
Supply	Galvanized Steel
Return and Spill	Galvanized Steel
General Exhaust	Galvanized Steel
Kitchen Hood Exhaust	Stainless Steel
Dishwasher Exhaust	Stainless Steel
Fume Hood Exhaust	Stainless Steel
Outside Air Intake	Galvanized Steel
Combustion Air	Galvanized Steel
Emergency Generation Ventilation	Galvanized Steel

B. Ductwork Pressure Class Schedule:

AIR SYSTEM	PRESSURE CLASS
Constant Volume Supply	3 inch wg regardless of velocity.
Variable Air Volume Supply (downstream of VAV boxes)	2 inch wg regardless of velocity.
Variable Air Volume Supply (upstream of VAV boxes)	6 inch wg
Return and Relief, Spill	3 inch wg
General Exhaust	3 inch wg
Dishwasher Exhaust	3 inch wg
Fume Hood Exhaust	6 inch wg
Emergency Generation Ventilation	2 inch wg

1. Note: Minimum pressure class for systems other than those listed above must be 2” w.g.

END OF SECTION 23 31 00

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SECTION 23 33 00 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
1. Back-draft dampers.
2. Combination fire-and-smoke dampers.
3. Duct access doors.
4. Smoke dampers.
5. Volume control dampers.
6. Remote cable control damper.
7. Flexible duct connections.
8. Duct test holes.
9. Dial thermometers.
10. Static pressure gages.

B. Related Sections:
1. Section 23 09 23 - Direct-Digital Control System for HVAC: Execution and Product requirements for connection and control of Combination Smoke and Fire Dampers for placement by this section.
2. Section 23 31 00 - HVAC Ducts and Casings: Requirements for duct construction and pressure classifications.
3. Division 26 - Wiring Connections: Execution requirements for connection of electrical Combination Smoke and Fire Dampers specified by this section.

1.3 REFERENCES

A. Air Movement and Control Association International, Inc.:
1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

B. ASTM International:
1. ASTM E1 - Standard Specification for ASTM Thermometers.

C. National Fire Protection Association:
1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.
2. NFPA 92A - Recommended Practice for Smoke-Control Systems.

D. Sheet Metal and Air Conditioning Contractors:
1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
2. SMACNA - Fire, Smoke and Radiation Damper Installation Guide

E. Underwriters Laboratories Inc.:
   1. UL 555 - Standard for Safety for Fire Dampers.
   2. UL 555C - Standard for Safety for Ceiling Dampers.
   3. UL 555S - Standard for Safety for Smoke Dampers.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers, duct access doors, and duct test holes.

C. Product Data: Submit data for shop fabricated assemblies and hardware used.

D. Product Data: Submit for the following. Include where applicable electrical characteristics and connection requirements.
   1. Fire dampers including locations and ratings.
   2. Smoke dampers including locations and ratings.
   3. Backdraft dampers.
   4. Flexible duct connections.
   5. Volume control dampers.
   6. Cable control dampers.
   7. Duct access doors.
   8. Duct test holes.

E. Product Data: For fire dampers, smoke dampers, and combination fire and smoke dampers, submit the following:
   1. Include UL ratings, dynamic ratings, leakage, pressure drop and maximum pressure data.
   2. Indicate materials, construction, dimensions, wiring diagrams and installation details.
   3. Damper pressure drop ratings based on tests and procedures performed in accordance with AMCA 500.

F. Manufacturer's Installation Instructions: Submit for Fire and Combination Smoke and Fire Dampers.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of access doors, test holes.

B. Operation and Maintenance Data: Submit for Combination Smoke and Fire Dampers.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Dampers tested, rated and labeled in accordance with the latest UL requirements.

C. Damper pressure drop ratings based on tests and procedures performed in accordance with AMCA 500.

D. Perform Work in accordance with NYCBC and NYCMC.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Protect dampers from damage to operating linkages and blades.

B. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.

C. Storage: Store materials in a dry area indoor, protected from damage.

D. Handling: Handle and lift dampers in accordance with manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.11 COORDINATION

A. Coordinate Work where appropriate with building control Work.

1.12 WARRANTY

A. Furnish five-year manufacturer warranty for air duct accessories.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR ALL ACCESSORIES

A. All accessories must have a pressure rating equivalent to the duct system that they are installed in.

B. Material construction must match system that accessories are installed in.

2.2 BACK-DRAFT DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ruskin
2. Greenheck
3. Air Balance, Inc.
4. Or approved equal

B. Product Description: Multi-Blade, back-draft dampers: Parallel-action, gravity-balanced, Galvanized 16 gage thick steel. Blades, maximum 6-inch width, center pivoted, with felt or flexible vinyl sealed edges. Blades linked together in rattle-free manner with 90-degree stop, steel ball bearings, and plated steel pivot pin. Furnish dampers with adjustment device to permit setting for varying differential static pressure.

2.3 COMBINATION FIRE AND SMOKE DAMPERS (FSD)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Ruskin.
2. Greenheck
3. Nailor
4. Or approved equal.

B. Fabricate in accordance with NFPA 90A, UL 555, and UL 555S.

C. Fire Resistance: 1-1/2 hours.

D. Leakage Rating: Class I, maximum of 8 cfm at 4 inches wg differential pressure.

E. Damper Temperature Rating: 350 degrees F for smoke control systems.

F. Frame: 13 gage, galvanized steel.

G. Blades:
1. Style: Airfoil-shaped, single piece, double skin.
2. Action: Opposed.
3. Orientation: Horizontal.
4. Material: Minimum 16 gage equivalent thickness, galvanized steel.
5. Width: Maximum 6 inches.

H. Bearings: Stainless steel pressed into frame.

I. Seals: Silicone blade edge seals and flexible stainless steel jamb seals.

J. Linkage: Concealed in frame.

K. Release Device: Close in controlled manner and allow damper to be automatically reset.

L. Actuator:
1. Type: Electric 120 volt, 60 hertz, two-position, fail close.
2. Mounting: External.
3. Each combination fire smoke damper must be equipped with a UL Classified “Fire Stat” to permit damper to reopen during dynamic smoke control and must mechanically and electrically close damper

upon reaching the damper's maximum degradation test temperature in accordance with UL555S. Damper can be opened via the Fire Alarm System for smoke purge. The damper operation and construction must meet requirements of UL555S, latest edition.

4. All wiring material required to interconnect the operator with detection and/or alarm or other systems must be furnished by the Contractor.

M. Fall-safe design must enable damper to automatically assume the desired position when power is interrupted.

N. Finish: Mill galvanized.

O. Damper switch package to remotely indicate blade positions.

P. Factory installed sleeve and mounting angles per local codes. Furnish silicone caulk factory applied to sleeve at damper frame to comply with leakage rating requirements.

Q. Damper for Out-of-Wall (OW) installations must have factory-provided integral sleeve with UL required insulation. Sleeve configurations must meet project requirement.

2.4 DUCT ACCESS DOORS

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.

B. Fabrication: Rigid and close fitting of galvanized steel or stainless steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, furnish minimum 1 inch thick insulation with sheet metal cover, minimum 22 gage interior casing.

1. Less than 12 inches square, secure with sash locks.
2. Up to 18 inches Square: Furnish two hinges and two sash locks.
3. Up to 24 x 48 inches: Three hinges and two compression latches.
4. Larger Sizes: Furnish additional hinge.
5. Access doors located on the bottom of ducts must have cam fasteners in lieu of hinges in order to avoid interference with ceiling channel supports.
6. Provide access doors upstream and downstream of reheat coils.
7. Provide access door for all dampers including volume dampers, fire dampers, smoke dampers, combination dampers and motorized dampers.
8. Access panels with sheet metal screw fasteners are not acceptable.

2.5 DYNAMIC FIRE DAMPERS

A. Fabricate in accordance with NFPA 90A and UL 555.

B. Fire Resistance: 1-1/2 hours.

C. Dynamic Closure Rating: Dampers classified for dynamic closure to 2000 fpm and 4 inches wg static pressure.

D. Construction:

1. Integral Sleeve Frame: Minimum 14 gage roll formed galvanized steel. Length: 12 inches.

2. Blades:
   a. Style: Curtain type.
   b. Action: Spring closure upon fusible link release.
   c. Material: Minimum 24 gage roll formed, galvanized steel.
3. Closure Springs: Type 301 stainless steel, constant force type.

E. Fusible Link Release Temperature: 212 degrees F.

F. Mounting: Vertical or horizontal as indicated on Drawings.

G. Duct Transition Connection, Damper Style:
1. B style - rectangular connection, blades out of air stream, high free area.
2. G style - A style connection, grille mounting tabs at end of sleeve for grille.

H. Finish: Mill galvanized:
1. Manufactures: Subject to compliance with requirements, provide products by one of the following:
   a. Ruskin
   b. Greenheck
   c. Nailor
   d. Or approved equal.

I. Damper for Out-of-Wall (OW) installations must have factory-provided integral sleeve with UL required insulation. Sleeve configuration must meet project requirements.

2.6 SMOKE DAMPERS

A. Fabricate in accordance with NFPA 90A and UL 555S.

B. Fire Resistance: 1-1/2 hours.

C. Leakage Rating: Class I, maximum of 8 cfm at 4 inches wg differential pressure.

D. Damper Temperature Rating: 350 degrees F for smoke control systems.

E. Frame: 16 gage, galvanized steel.

F. Blades:
1. Style: Airfoil-shaped, single piece, double skin.
2. Action: Opposed.
3. Orientation: Horizontal.
4. Material: Minimum 16 gage equivalent thickness, galvanized steel.
5. Width: Maximum 6 inches.

G. Bearings: Stainless steel pressed into frame.

H. Seals: Silicone blade edge seals and flexible stainless steel jamb seals.

I. Linkage: Concealed in frame.

J. Actuator:
   1. Type: Electric 120 volt, 60 hertz, two-position, fail close and Electric 24 volt, 60 hertz, two-position, fail close.

K. Sleeve: Factory installed 20 gage sleeve, minimum 12 inches long.

L. Finish: Mill galvanized.

2.7 VOLUME CONTROL DAMPERS

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.

B. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 x 72 inches. Assemble center and edge crimped blades in prime coated or galvanized frame channel with suitable hardware.

C. End Bearings: Except in round ductwork 12 inches and smaller, furnish end bearings. On multiple blade dampers, furnish oil-impregnated nylon or sintered bronze bearings. Furnish closed end bearings on ducts having pressure classification over 2 inches wg.

D. Quadrants:
   1. Furnish locking, indicating quadrant regulators on single and multi-blade dampers.
   2. On insulated ducts mount quadrant regulators on standoff mounting brackets, bases, or adapters.
   3. Where rod lengths exceed 30 inches furnish regulator at both ends.

2.8 REMOTE CABLE CONTROL VOLUME DAMPERS

A. Provide cable control system for all volume dampers located above gypsum board and other inaccessible ceilings.

B. Bowden, Durodyne, Dayton or approved equal cable control kit must provide all required hardware that will be mounted onto all rectangular and round volume dampers and provide all interlocking gears and cabling for ceiling mounted control. Coverplate must be 7/8-inch diameter cold rolled steel cover with zinc plating for painting. Provide five (5) 12-inch wrenches for operation.

2.9 FLEXIBLE DUCT CONNECTIONS

A. Provide a suitable flexible connection in both the intake and discharge sides of each fan and air handling unit, where they connect to ductwork.

B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.

C. Connector: Fabric crimped into metal edging strip.
   1. Fabric: UL 181 Class 0 listed fire-retardant neoprene coated woven glass fiber fabric conforming to NFPA 90A, minimum density 30 oz per sq yd.
   2. Net Fabric Width: Minimum 6 inches wide; maximum 10 inches wide.
   3. Metal: 3 inch wide and 24 gage galvanized steel.

D. High Density Vinyl Sheet: Minimum 0.55 inch thick, 0.87 lbs. per sq ft, 10 dB attenuation in 10 to 10,000 Hz range.

2.10 DUCT TEST HOLES

A. Permanent Test Holes: Factory fabricated, airtight flanged fittings with screw cap. Furnish extended neck fittings to clear insulation.

B. Provide tappings in ducts for thermometers where specified. In addition, provide an airtight plugged tapping located as follows:
1. Upstream of each reheat coil.
2. Downstream of each reheat coil.
3. In each supply and return air duct at each floor.

2.11 DIAL THERMOMETERS

A. Thermometer: ASTM E1, stainless steel case, bimetallic helix actuated with silicone fluid damping, white with black markings and black pointer hermetically sealed lens, stainless steel stem.
1. Size: 3 inch.
2. Lens: Clear Lexan.
3. Accuracy: 1 percent.
4. Calibration: Degrees F.

2.12 STATIC PRESSURE GAGES

A. Dial Gages: 3-1/2 inch diameter dial in metal case, diaphragm actuated, black figures on white background, front calibration adjustment, 2 percent of full scale accuracy.

B. Accessories: Static pressure tips with compression fittings for bulkhead mounting, 1/4 inch diameter tubing.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify rated walls are ready for fire damper and fire smoke damper installation. Verify the framed opening size in dry walls.

B. Verify ducts and equipment installation is ready for accessories.

C. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

3.3 INSTALLATION

A. Install in accordance with NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 23 31 00 for duct construction and pressure class.

B. Install dampers and accessories where indicated on Drawings.

C. Access Doors: Install access doors at the following locations and as indicated on Drawings:
1. Spaced every 50 feet of straight duct.
2. Upstream of each reheat coil.
3. Before and after each duct mounted filter.
4. Before and after each duct mounted coil.
5. Before and after each duct mounted fan.
6. Before and after each automatic control damper.
7. Before and after each fire damper, smoke damper, combination fire and smoke damper.
8. Downstream of each VAV box.
9. Install at locations for cleaning kitchen exhaust ductwork in accordance with NFPA 96 and NYCMC.

D. Access Door Sizes: Install minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated on Drawings. Install 4 x 4 inch for balancing dampers only. Review locations prior to fabrication.

E. Install temporary duct test holes where indicated on Drawings and required for testing and balancing purposes. Cut or drill in ducts. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

F. Install fire dampers, combination fire and smoke dampers and smoke dampers at locations as indicated on Drawings and where required. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
1. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92A UL555 and UL555S.
2. Install dampers square and free from racking with blades running horizontally.
3. Do not compress or stretch damper frame into duct or opening.
4. Handle damper using sleeve or frame. Do not lift damper using blades, actuator, or jack shaft.
5. Install bracing for multiple section assemblies to support assembly weight and to hold against system pressure. Install bracing as needed.

3.4 INSTALLATION - THERMOMETERS

A. Install thermometers in air duct systems on flanges.

B. Locate duct-mounted thermometers minimum 10 feet downstream of mixing-dampers, coils, or other devices causing air turbulence.

C. Install static pressure gages to measure across filters and filter banks, (inlet to outlet). On multiple banks, provide manifold and single gage.

D. Provide instruments with scale ranges selected according to service with largest appropriate scale.

E. Install thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.

F. Adjust thermometers to final angle, clean windows and lenses, and calibrate to zero.

G. Install thermometers in the following locations:
   1. Each supply air zone.
   2. Outside air.
   3. Return air.
   4. Mixed air.

3.5 DEMONSTRATION

A. Demonstrate re-setting of fire dampers and fire smoke dampers to Commissioner.

3.6 STATIC PRESSURE AND FILTER GAGES

A. Install filter and static pressure gages in the following locations:
   1. Built up filter banks.
   2. Unitary filter sections.
   3. Supply fan discharge.

END OF SECTION 23 33 00

SECTION 23 34 00 - HVAC FANS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Centrifugal fans.
   2. Centrifugal square inline fans.

B. Related Sections:
   1. Section 23 05 13 - Common Motor Requirements for HVAC Equipment: Product requirements for motors for placement by this section.
   2. Section 23 05 48 - Noise and Vibration Controls for HVAC Piping and Equipment: Product requirements for resilient mountings and snubbers for fans for placement by this section.
   3. Section 23 07 00 - HVAC Insulation: Product requirements for power ventilators for placement by this section.
   4. Section 23 09 23 - Direct Digital Control System for HVAC: Controls remote from unit.
   5. Section 23 31 00 - HVAC Ducts and Casings: Product requirements for hangers for placement by this section.
   6. Section 23 33 00 - Air Duct Accessories: Product requirements for duct accessories for placement by this section.
   7. Division 26 - Wiring Connections: Execution and product requirements for connecting equipment specified by this section.

1.3 REFERENCES

A. American Bearing Manufacturers Association:
   1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
   2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

B. Air Movement and Control Association International, Inc.:
   1. AMCA 99 - Standards Handbook.
   2. AMCA 204 - Balance Quality and Vibration Levels for Fans.
   3. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
   4. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
   5. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.

C. American Refrigeration Institute:
   1. ARI 1060 - Air-to-Air Energy Recovery Ventilation Equipment Certification Equipment Program.

D. National Electrical Manufacturers Association:
   1. NEMA MG 1 - Motors and Generators.
   2. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

E. Underwriters Laboratories Inc.:
   1. UL 705 - Power Ventilators, Smoke Control File No. MH17511.
   2. UL 762 Grease Removal File No. MH11745.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate size and configuration of fan assembly, mountings, weights, ductwork and accessory connections.

C. Product Data: Submit data on each type of fan and include accessories, fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, electrical characteristics and connection requirements.

D. Manufacturer's Installation Instructions: Submit fan manufacturer’s instructions.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

F. Submit motor data in accordance with 23 05 13.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Performance Ratings: Conform to AMCA 210 and bear AMCA Certified Rating Seal.

C. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.

D. UL Compliance: All fans must be UL listed and labeled, designed, manufactured, and tested in accordance with UL 705. Fans used for smoke control must comply with UL 705 File No. MH17511. Fans used for grease removal must comply with UL 762 File No. MH11745.

E. Balance Quality: Conform to AMCA 204.

F. Energy Recovery Unit Wheel Energy Transfer Rating: Meet ARI 1060.

G. Perform Work in accordance with NYCBC.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience properly trained by manufacturer.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Protect motors, shafts, and bearings from weather and construction dust.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.11 WARRANTY

A. Furnish five-year manufacturer's warranty for fans.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL FANS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Greenheck Corp.
   2. New York Blower
   3. Twin Cities
   4. Or approved equal

B. Performance:
   1. Performance Base: Sea level conditions.
   2. Temperature Limit: Maximum 300 degrees F. for non-smoke control systems and 600 degrees F. for smoke control systems.
   3. Static and Dynamic Balance: Eliminate vibration or noise transmission to occupied areas.

C. Wheel and Inlet:
   1. Backward Inclined: Steel construction with smooth curved inlet flange, back plate, backward curved blades welded to flange and back plate; cast steel hub riveted to back plate and keyed to shaft with set screws.
   2. Forward Curved: Galvanized steel construction with inlet flange, back plate, shallow blades with inlet and tip curved forward in direction of airflow, welded to flange and back plate; steel hub swaged to back plate and keyed to shaft with set screw.

3. Airfoil Wheel: Steel construction with smooth curved inlet flange, back plate die formed hollow airfoil shaped blades continuously welded at tip flange, and back plate; cast steel hub riveted to back plate and keyed to shaft with set screws.
4. Wheels must be continuously welded construction.

D. Housing:
1. Steel continuously welded, braced and designed to minimize turbulence with spun inlet bell and shaped cut-off.
2. Factory finish before assembly to manufacturer's standard. For fans handling air downstream of humidifiers, furnish two additional coats of paint.
3. Bolted construction with horizontal flanged split housing, where indicated.
4. Fabricate plug fans without volute housing, in lined steel cabinet.

E. Bearings and Sleeves:
1. Bearings: Pillow block type, self-aligning, grease-lubricated roller bearings, or ABMA 11, L-10 life at 120,000 hours.
2. Shafts: Hot rolled steel, ground and polished, with key way, protectively coated with lubricating oil, and shaft guard.
3. V-Belt Drive: Cast iron or steel sheaves, dynamically balanced, keyed. Variable and adjustable pitch sheaves for motors 15 hp and under, selected so required rpm is obtained with sheaves set at mid-position. Fixed sheave for 20 hp and over or fan controlled by VFD, matched belts (minimum 2 belts), and drive rated as recommended by manufacturer or minimum 1.5 times nameplate rating of motor.
4. Belt Guard: Fabricate to SMACNA Standard; 0.106 inch thick, 3/4 inch diamond mesh wire screen welded to steel angle frame or equivalent, prime coated. Secure to fan or fan supports without short circuiting vibration isolation, with provision for adjustment of belt tension, lubrication, and use of tachometer with guard in place.

F. Accessories:
1. Inlet/Outlet Screens: Galvanized steel welded grid.
2. Access Doors: Shaped to conform to scroll, with quick opening latches and gaskets.
3. Scroll Drain: 1/2 inch steel pipe coupling welded to low point of fan scroll.

2.2 CENTRIFUGAL SQUARE INLINE FANS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Greenheck Corp.
2. Loren Cook Company
3. Twin Cities
4. Or approved equal

B. Product Description: V-belt drive with galvanized steel housing lined with 1 inch acoustic glass fiber insulation, integral inlet cone, removable access doors on 3 sides, inlet and outlet duct collar, gravity backdraft damper in discharge, horizontal hanging brackets.

C. Fan Wheel: Backward inclined centrifugal type, aluminum construction.

D. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

E. Motor and Drive Mounting: Out of air stream.

F. Motor: Open drip proof or TEFC to suit the application

G. Bearings: ABMA 9 life at 200,000 hours.

H. Accessories:
1. Belt guard.
2. Motor cover.
3. Inlet safety screen.
4. Outlet safety screen.
5. Flexible duct connector.
6. Filter box with throwaway type filter.
7. Flanged inlet and outlet.
8. Inlet and Outlet ductwork companion flange.
9. Disconnect Switch: NEMA 250 Type 1, heavy duty enclosure.
10. Fan speed controller.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify roof curbs are installed and dimensions are as shown on shop drawings.

3.3 PREPARATION

A. Install roof curbs.

3.4 INSTALLATION

A. Install motorized dampers on inlet to roof and wall exhaust fans.

B. Provide backdraft dampers on outlet from cabinet and ceiling fans and as indicated on Drawings.

C. Install safety screen where inlet or outlet is exposed.

D. Pipe scroll drains to nearest floor drain.

E. Provide adjustable sheaves required for final air balance. Replace adjustable sheave with fixed sheaves after balancing as required.

F. Each fan must be factory painted inside and out with high grade machinery grey enamel paint.

G. Fans with wheel diameters up to 27 inches must have overhung wheel and pulley, Arrangement 2. Fans with larger diameter wheels must have overhung pulley, Arrangement 3. Fans with wheels 24 inches and larger must have cleanout door in scroll, with wedge type latches.

H. Fans too large to pass through available doorways may be split in halves along center of shaft, with hubs, etc., arrange to bolt together when erected. Such bolts must have double nuts and cotter pins to prevent same from loosening. Provide scroll drains in all fans.

I. Fan wheel diameters shown are minimum diameter. Fan BHP indicated for each duty must not be exceeded over its entire operating range.

J. Exhaust fans exposed to outdoor weather must have two coats of chlorinated rubber base paint applied in the factory.

K. Insulated fans: Cleanout doors must be raised type to finish flush with outside of insulation covering.

3.5 MANUFACTURER'S FIELD SERVICES

A. Before start-up, factory technician must be on site to certify the alignment in a written report.

B. Furnish services of factory-trained representative for minimum of one (1) day to start-up, calibrate controls, and instruct the City of New York on operation and maintenance.

3.6 CLEANING

A. Vacuum clean coils and inside of fan cabinet.

3.7 DEMONSTRATION

A. Demonstrate fan operation and maintenance procedures.

3.8 PROTECTION OF FINISHED WORK

A. Do not operate fans for until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION 23 34 00

SECTION 23 37 00 - AIR OUTLETS AND INLETS

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Diffusers.
   2. Registers.
   3. Louvers.
   4. Goosenecks.

B. Related Sections:
   1. Section 10 21 40 - Stationary Metal Blade Wall Louvers.
   2. Section 09 90 00 - Painting and Coating: Execution and product requirements for Painting of ductwork visible behind outlets and inlets specified by this section.
   3. Section 23 33 00 - Air Duct Accessories: Volume dampers for inlets and outlets.

1.3 REFERENCES

A. Air Movement and Control Association International, Inc.:
   1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
   1. ASHRAE 70 - Method of Testing for Rating the Performance of Air Outlets and Inlets.

C. Sheet Metal and Air Conditioning Contractors:
   1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit sizes, finish, and type of mounting. Submit schedule of outlets and inlets showing type, size, location, application, throw, and noise level.

C. Samples: Submit one (1) of each required air outlet and inlet type.

D. Test Reports: Rating of air outlet and inlet performance.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of air outlets and inlets.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Test and rate diffuser, register, and grille performance in accordance with ANSI/ ASHRAE 70.

C. Test and rate louver performance in accordance with AMCA 500.

D. Perform Work in accordance with NYCBC.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience, and with service facilities within proximity of Project.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

PART 2 - PRODUCTS

2.1 RECTANGULAR CEILING DIFFUSERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Anemostat Air Products
2. E. H Price Company
3. Nailor Industries, Inc.
4. Titus
5. Or approved equal

B. Type: Square stamped, multi-core or plaque panel construction diffuser to discharge air in required pattern with sector baffles where indicated.

C. Frame: To match ceiling construction.

D. Fabrication: 24 gauge steel with baked enamel. Custom color selected by the Commissioner.

E. Accessories: Butterfly damper and multi-louvered equalizing grid with damper adjustable from diffuser face. Molded and foil-baked insulation blankets.

2.2 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Anemostat Air Products

2. E. H Price Company
3. Nailor Industries, Inc.
4. Titus
5. Or approved equal

B. Furnish materials in accordance with NYCBC.

C. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees, along long face.

D. Frame: 1-1/4 inch margin with concealed mounting.

E. Fabrication: Steel with 20 gage minimum frames and 22 gage minimum blades, steel and aluminum with 20 gage minimum frame, or aluminum extrusions, with factory finish. Custom color selected by the Commissioner.

F. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

G. Gymnasiums: Furnish front pivoted or welded in place blades, securely fastened to be immobile.

2.3 LINEAR MODULAR SLOT

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Anemostat Air Products
2. E. H Price Company
3. Nailor Industries, Inc.
4. Titus
5. Or approved equal

B. Type: Extruded aluminum, continuous linear slot with extruded aluminum pattern controller.

C. Frame: To match ceiling construction.

D. Fabrication: Aluminum extrusions .062 inch thick with end-caps, mitered corner and blank-offs for a continuous appearance.

E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.4 LOUVERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Greenheck Corp.
2. Industrial Louvers Inc.
3. Ruskin Manufacturing
4. Or approved equal

B. Furnish materials in accordance with NYCBC.

C. Louvers: As specified in Section 10 21 40.

D. Product Description: Stationary, Stormproof, drainable.

E. Type: 4 inch deep with blades on 45 degree slope with center baffle and return bend, heavy channel frame.

F. Fabrication: 12 gage thick extruded aluminum, welded assembly, with factory baked enamel finish. Custom color selected by the Commissioner.

G. Mounting: Furnish with interior angle flange for installation.

H. Bird Screen: Bird screen with 1/2 inch square mesh for exhaust and 3/4 inch for intake.

I. Insect Screen: Aluminum mesh, set in aluminum frame.

J. External louver must match architectural louvers and be approved by the Commissioner.

2.5 GOOSENECKS

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, of minimum 18 gage galvanized steel or stainless steel with bird screens.

B. Roof Curb: 24-inch high self-flashing, aluminum construction with continuously welded seams, built-in cant strips, 1 inch insulation and curb bottom, interior baffle with acoustic insulation, curb bottom, ventilated double wall, hinged curb adapter, and factory-installed nailer strip.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify inlet and outlet locations.

B. Verify ceiling and wall systems are ready for installation.

3.3 INSTALLATION

A. Install diffusers to ductwork with airtight connection.

B. Install balancing dampers on duct take-off to diffusers, grilles, and registers, whether or not dampers are furnished as part of diffuser, grille, and register assembly. Refer to Section 23 33 00.

C. Paint visible portion of ductwork behind air outlets and inlets matte black. Refer to Section 09 90 00.

D. Provide mounting frame/border to match ceiling construction for each type of outlet.

E. Install insulation blanket on diffusers and taped to duct collar insulation and edges of diffuser to make airtight.

F. Install or secure the retainer cable for diffusers having removable cores.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry and lighting arrangement.

END OF SECTION 23 37 00

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SECTION 23 40 00 - HVAC AIR CLEANING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Disposable, extended area panel filters.
   2. Filter frames and housings.
   3. Filter gages.

B. Related Sections:
   1. Section 23 05 13 - Common Motor Requirements for HVAC Equipment: Product requirements for motors for placement by this section.
   2. Division 26 - Wiring Connections: Execution requirements for wiring products for placement by this section.

1.3 REFERENCES

A. Air-Conditioning and Refrigeration Institute:
   1. ARI 850 - Commercial and Industrial Air Filter Equipment.

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
   1. ASHRAE 52.1 - Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter.

C. Military Standardization Documents:
   1. MIL MIL-STD-282 - Filter Units, Protective Clothing, Gas-Mask Components, and Related Products: Performance-Test Methods.

D. Underwriters Laboratories Inc.:
   1. UL 586 - High-Efficiency. Particulate, Air Filter Units.
   2. UL 867 - Electrostatic Air Cleaners.
   3. UL 900 - Air Filter Units.

1.4 PERFORMANCE REQUIREMENTS

A. Conform to ARI 850, Section 7.4.

B. Dust Spot Efficiency: Plus or minus 5 percent.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate filter assembly and filter frames, dimensions, motor locations, and electrical characteristics and connection requirements.

C. Product Data: Submit data on filter media, filter performance data, dimensions and electrical characteristics.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit instructions for operation, changing, and periodic cleaning.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience.

1.9 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

PART 2 - PRODUCTS

2.1 DISPOSABLE, EXTENDED AREA PANEL FILTERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Camfil Farr
2. Flanders
3. AAF
4. Or approved equal

B. Media: UL 900 Class 1, pleated, fine, glass fiber laminated to synthetic backing; supported and bonded to welded wire grid by corrugated aluminum separators.
1. Frame: Non-flammable for pre-filter, Galvanized steel for final filter.
2. Nominal thickness: 2 inches for pre-filter, 12 inches for final filter.

C. Rating, ASHRAE 52.2:
1. Dust spot efficiency: MERV 7/7A for pre-filter, MERV 13/13A for final filter.

2. Initial resistance at 500 fpm: Refer to drawing.
3. Recommended final resistance: Refer to drawing.

2.2 FILTER FRAMES AND HOUSINGS

A. General: Fabricate filter frames and supporting structures of 16 gage galvanized steel or extruded aluminum T-section construction with necessary gaskets between frames and walls. The track must accommodate 2-inch pre-filter and 12-inch final filter.

B. Standard Sizes: For interchange ability of filter media of other manufacturers; for panel filters, size for 24 x 24 inches filter media, minimum 2 inches thick and minimum 12 inches thick; for extended surface and high efficiency particulate air filters, provide for upstream mounting of panel filters.

C. Side Servicing Housings: Flanged for insertion into ductwork, of reinforced 16 gage galvanized steel; access doors with continuous gaskets and positive locking devices on both sides; extruded aluminum tracks or channels for primary and secondary filters with positive sealing gaskets.

2.3 FILTER GAGES

A. Direct Reading Dial: 3-1/2 inch diameter diaphragm actuated dial in metal case. Furnish vent valves, black figures on white background, front calibration adjustment, range 0-2.0 inch wg, 2 percent of full scale accuracy.

B. Accessories: Static pressure tips with integral compression fittings, 1/4 inch aluminum tubing, 2-way or 3-way vent valves.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install filters with felt, neoprene gaskets to prevent passage of unfiltered air around filters.

B. Install filter gage static pressure tips upstream and downstream of filters. Mount filter gages on outside of filter housing or filter plenum, in accessible position. Adjust, calibrate and level.

C. Do not operate fan system until temporary filters are in place. Replace temporary filters used during construction and testing, with clean set.

D. Seal any gaps between filter framing and unit casing to airtight.

END OF SECTION 23 40 00

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SECTION 23 73 00 - INDOOR CENTRAL-STATION AIR-HANDLING UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes modular factory fabricated air-handling units and accessories.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Execution requirements for housekeeping pads specified by this section.
2. Section 23 05 13 - Common Motor Requirements for HVAC Equipment: Product requirements for electric motors for placement by this section.
3. Division 23 05 15 - Variable-Frequency Motor Controllers: Variable frequency controllers.
4. Section 23 05 48 - Noise and Vibration Controls for HVAC Piping and Equipment: Product requirements for Vibration Isolation for placement by this section.
5. Section 23 07 00 - HVAC Insulation: Product requirements for insulation for placement by this section.
6. Section 23 09 23 - Direct Digital Control System for HVAC: Controls remote from unit.
7. Section 23 09 93 - Sequence of Operations for HVAC Controls: Sequences of operation applying to units in this section.
8. Section 23 23 00 - Refrigerant Piping: Product requirements for refrigerant piping connections to air handling units.
9. Section 23 33 00 - Air Duct Accessories: Product requirements for flexible duct connections for placement by this section.
10. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Wiring Connections: Electrical connection to units
11. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Wiring Connections: Electrical connection to units
12. Section 26 05 33 - Raceway and Boxes for Electrical Systems: Wiring Connections: Electrical connection to units.

1.3 REFERENCES

A. American Bearing Manufacturers Association:
1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

B. Air Movement and Control Association International, Inc.:
1. AMCA 99 - Standards Handbook.
2. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.

3. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
4. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
5. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

C. Air-Conditioning and Refrigeration Institute:
1. ARI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils.
2. ARI 430 - Central-Station Air-Handling Units.
3. ARI 610 - Central System Humidifiers for Residential Applications.
4. ARI Guideline D - Application and Installation of Central Station Air-Handling Units.

D. National Electrical Manufacturers Association:
1. NEMA MG 1 - Motors and Generators.

E. Sheet Metal and Air Conditioning Contractors:
1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

F. Underwriters Laboratories Inc.:
1. UL 900 - Air Filter Units.
2. UL - Fire Resistance Directory.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate assembly, unit dimensions, weight loading, required clearances, construction details, field connection details, and electrical characteristics and connection requirements.

C. Product Data, submit the following:
1. Published Literature: Indicate capacities, ratings, gages and finishes of materials, and electrical characteristics and connection requirements.
2. Filters: Data for filter media, filter performance data, filter assembly, and filter frames.
3. Fans: Performance and fan curves with specified operating point plotted, power, RPM.
4. Sound Power Level Data: Fan outlet and casing radiation at rated capacity.
5. Finish and color chart.
6. Dampers: Include leakage, pressure drop, and sample calibration curves. Indicate materials, construction, dimensions, and installation details.
7. Electrical Requirements: Power supply wiring including wiring diagrams for interlock and control wiring. Indicate factory installed and field installed wiring.
8. Furnish one print and one sepia of each of the following for approval:
    a. Floor plan showing dimensions and details for installation, including total weight of unit and of each section for multiple section units.
    b. Front and side views as required to completely describe accessories and show required dimensions.
    c. Details of housing construction showing materials of construction, structural elements, methods of providing thermal breaks and door seals, equipment supports, housing insulation and piping, details of wall air sealing design, electrical and control penetration of housing and assembly instructions and requirements.

d. Submit complete shop Drawings on fans, coils, condensate drain system, filters, etc. contained within the unit including fan performance curves.
e. Submit design performance including motor horsepower, CFM, fan static, coil conditions and internal unit pressure drops.
f. Approval of Drawings does not relieve the supplier from the responsibility of furnishing the specified product under these Specifications.
g. After the installation of the units is complete, furnish one complete set of full size blue line prints and one unfolded full size 'sepia" of each drawing as-built to the Commissioner.

D. Samples: Submit two (2) of each type of replacement filter media with frame.

E. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements and include start-up instructions.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit instructions for lubrication, filter replacement, motor and drive replacement, spare parts lists and wiring diagrams.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Outside Air Damper Leakage: Test in accordance with AMCA 500.

C. Perform Work in accordance with NYCBC.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Accept units and components on site in factory protective containers, with factory shipping skids and lifting lugs. Inspect for damage.

B. Protect units from weather and construction traffic by storing in dry, roofed location.

PART 2 - PRODUCTS

2.1 AIR HANDLING UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Buffalo
   2. York
   3. Carrier
   4. Trane
   5. Or approved equal

B. Configuration: Fan section plus accessories, including:
   1. Cooling coil section.
   2. Heating coil.
   3. Filter section.
   4. Combination filter/mixing box section.
   5. Mixing box section.
   6. Face and bypass damper section.

C. Performance Base: Sea level pressure or altitude.

D. Fabrication: Conform to AMCA 99 and ARI 430.

2.2 CASING

A. Channel base and drain pan of welded steel. Assemble sections with gaskets and bolts. Unit must be constructed of a complete frame with removable panels and supports.

B. Outside Casing:
   1. Galvanized Steel: 18 gauge.

C. Inside Casing: Galvanized Steel: Solid, 22 gage for all sections except as noted below.
   1. Galvanized Steel: Perforated, 22 gage for all fan sections.
   2. Stainless Steel: Solid, 22 gage cooling coil, humidifier, mixing and outdoor air intake sections.

D. Floor Plate:
   1. Galvanized Steel: 0.1381 inch thick.

E. Insulation: Neoprene coated, glass fiber, applied to internal surfaces with adhesive and weld pins with exposed edges of insulation coated with adhesive.
   1. 'K' factor at 75 degrees F: Maximum 0.26 Btuh inch/ sq ft/ degrees F.
   2. Density: 1-1/2 inch thick, 1-1/2 lbs/cu ft.

F. Finish: Manufacturers standard paint on exterior.

G. Walk-in Access Doors: Minimum 18-inch width Galvanized steel (to match interior wall for the section which it is located) insulated sandwich construction, for flush mounting, with three (3) hinges, gasket,

safety latches, and handle assemblies, and 12 x 12 inch inspection window of 1/4 inch thick Plexiglas on both sides of the unit.

H. Lights: Located in accessible sections suitable for damp locations with wire guards, factory wired to weatherproof switch and pilot light-mounted on casing exterior. In humidifier sections, furnish lights suitable for wet locations.

I. Drain Pans: Double thickness stainless steel with insulation between layers with welded corners. Cross break and pitch to drain connection. Furnish drain pans under cooling coil section, mixing section, humidifier section and plenum sections.

J. Strength: Furnish structure to brace casings for suction pressure of 4 inch wg, and positive pressure of 6 inches, with maximum deflection of 1 in 200.

2.3 FANS

A. Fans must be either forward curved, backward inclined air foil, single width, single inlet, centrifugal, double width, double inlet, centrifugal, vane axial or plug type fan. Refer to Contract Drawings.

B. Fan Module: The vibration levels of the complete fan assembly must be checked and excessive vibration (including that caused by fan imbalance) must be eliminated in the factory. Fan shaft must be properly sized and protectively coated with lubricating oil. Fan wheels must be keyed to fan shaft to prevent slipping. Fan shafts must be solid and designed so that fan shaft does not pass through its first critical speed as the unit comes up to its rated rpm. Fan shafts must not exceed 70% of their first critical speed at any cataloged rpm. Fan modules must be provided with an access door on the drive side of the fan. Fan wheels must be fully welded.

C. FC Fan Modules: Fan must be double-width, double-inlet, multiblade type as produced by the unit manufacturer. Fan must be forward curved (FC) as required for stable operation and optimum energy efficiency. Fan must be equipped with self-aligning, anti-friction bearings with an L-10 life of 120,000 hours. Fan performance must be certified as complying with ARI Standard 430-89.

D. BI Fan Modules: Fan must be double-width, double-inlet, multiblade type as produced by the unit manufacturer. Fan must be backward curved (BI) as required for stable operation and optimum energy efficiency. Fan must be equipped with self-aligning, anti-friction bearings with an L-10 life of 120,000 hours. Fan performance must be certified as complying with ARI Standard 430-89.

E. AF Fan Modules: Fan must be double-width, double-inlet, multiblade type as produced by the unit manufacturer. Fan must be backward-inclined airfoil (AF) as required for stable operation and optimum energy efficiency. Fan must be equipped with self-aligning, anti-friction bearings with an L-10 life of 120,000 hours. Fan performance must be certified as complying with ARI Standard 430-89.

F. Fan Isolation: Fan connection must be isolated from unit casing by a flexible canvas duct with restraints.

G. Performance Ratings: Conform to AMCA 210 and label with AMCA Certified Rating Seal.

H. Sound Ratings: AMCA 301, tested to AMCA 300 and label with AMCA Certified Sound Rating Seal.

I. Bearings: Self-aligning, grease lubricated, ball or roller bearings with lubrication fittings extended to exterior of casing with copper tube and grease fitting rigidly attached to casing.

J. Mounting: Locate fan and motor internally on welded steel base coated with corrosion resistant paint. Factory mount motor on slide rails. Furnish access to motor, drive, and bearings through removable casing panels or hinged access doors. Mount base on vibration isolators. Provide housed Two-Inch Spring Isolators: Fan motor assemblies must be internally isolated from unit casing with a housed 2-inch deflection spring isolator, furnished and installed by unit manufacturer. Provide thrust restraints to limit horizontal travel during startup to 1/4".

K. Fan Modulation: Variable Frequency Drive. Refer to Section 23 05 15.

2.4 MOTORS

A. Refer to Section 23 05 13 for motor requirements.

2.5 BEARINGS AND DRIVES

A. Bearings: Pillow block type, self-aligning, grease-lubricated roller bearings, or ABMA 11, L-10 life at 120,000 hours.

B. Shafts: Solid, hot rolled steel, ground and polished, with key-way, and protectively coated with lubricating oil.

C. V-Belt Drive: Cast iron or steel sheaves, dynamically balanced, bored to fit shafts, and keyed. Variable and adjustable pitch sheaves for motors 15 hp and under selected so required rpm is obtained with sheaves set at mid-position. Fans controlled by VFD must have fixed sheaves.

D. Belt Guard: Fabricate to SMACNA Standard; 3/4 inch thick diamond mesh wire screen welded to steel angle frame or equivalent, prime coated. Secure to fan or fan supports without short circuiting vibration isolation, with provision for adjustment of belt tension, lubrication, and use of tachometer with guard in place.

2.6 COILS

A. Casing with access to both sides of coils. Enclose coils with headers and return bends fully contained within casing. Slide coils into casing through removable end panel with blank off sheets and sealing collars at connection penetrations.

B. Drain Pans: 24 inch downstream of coil and down spouts for cooling coil banks more than one coil high.

C. Eliminators: Three break of Type 304 stainless steel, mounted over drain pan.

D. Air Coils: Certify capacities, pressure drops, and selection procedures in accordance with ARI 410.

E. Fabrication:
1. Tubes: 5/8 inch OD seamless copper expanded into fins, brazed joints.
2. Fins: Aluminum.

3. Casing: stainless steel for cooling coils; die formed channel frame of galvanized steel for others.

F. Refrigerant Coils:
1. Headers: Seamless copper tubes with silver brazed joints.
2. Liquid Distributors: Brass or copper venturi distributor with seamless copper distributor tubes.
3. Configuration: Down feed with bottom suction.

2.7 FILTERS

A. Filter Box: Section with filter guides, access doors from both sides, for side loading with gaskets and blank-off plates.

B. Filter Media: UL 900 listed, Class I, approved by local authorities.

C. Flat: 2 inches disposable, extended area panel filters. MERV-7A.

D. Extended Surface: 12-inch Filter box with holding frames and blank-off sheets, extended surface retained, high efficiency media filters with MERV-13A.

E. Filter Gauges: 3-1/2 inch diameter diaphragm actuated dial in metal case, 2 inch diameter diaphragm actuated dial in metal case, with static pressure tips.

F. Each filter section must be designed and constructed to house the specific type of filter shown on the equipment schedule. A double-walled hinged access door of the type described above must be provided on both sides of the section.

G. Filter tracks in flat sections must be of extruded aluminum for increased rigidity.

H. Filter sections must accept 2-inch and 12-inch filters. Sections must include side access slide rails.

I. Refer to Section 23 40 00 for additional filter requirements.

2.8 DAMPERS

A. Mixing Boxes: Section with factory-mounted air foil shaped outside and return air dampers of galvanized steel with vinyl bulb edging and edge seals in galvanized frame, with galvanized steel axles in self-lubricating brass bearings, in parallel blade arrangement with damper blades positioned across short air opening dimension. Furnish removable, full width support for freeze-protection thermostat, with removable end panel to permit support removal.

B. Mixing boxes and filter-mixing boxes must have parallel blades, interconnecting outside-air and return-air dampers. All mixing boxes and filter- mixing boxes must have a double-walled hinged access doors. Outside air and spill air damper must have minimum (open-close) and maximum (modulating) damper sections for proper control as noted in Contract Drawings. Spill (exhaust) dampers must be opposed blade type. Provide 16 gauge steel floors to protect insulation.

C. Outside Air Damper Leakage: Maximum 3.0 cfm per square foot at 1.0 inches wg pressure differential. Provide minimum and maximum sections with separation shafts. Refer to control section for size and location (min. and max.).

D. Damper Actuators: Furnish factory installed electronic damper actuators for outside air, return air, exhaust air dampers and face and bypass dampers.

2.9 OUTSIDE AIR MEASURING AND MODULATION DEVICE

A. Factory mounted in outside air and return air openings.

B. Damper and airflow measurement assembly sized to accommodate minimum outside airflow.

C. Construction:
1. Frame: Extruded aluminum.
2. Blades:
   a. Modulating Air Control:
      1) Style: Airfoil-shaped, single-piece.
      2) Action: Parallel.
      3) Orientation: Horizontal.
      4) Material: Heavy gage 6063-T5 extruded aluminum.
      5) Width: Maximum 5 inches.
   b. Stationary Sensing:
      1) Style: Airfoil-shaped, single-piece.
      2) Orientation: Horizontal.
      3) Material: Heavy gage 6063-T5 extruded aluminum.
      4) Width: Maximum 5-1/4 inches.
      5) Finish: Anodized.
3. Bearings: Self-lubricating molded synthetic sleeve, turning in extruded hole in frame.
4. Seals:
   a. Blade: Extruded rubber. Mechanically attached to blade edge.
   b. Jamb: Stainless steel, flexible metal compression type.
   c. Linkage: Concealed in frame.
   d. Axles: Minimum 1/2 inch diameter plated steel, hex-shaped, mechanically attached to blade.
   e. Mounting: Vertical.
   f. Electric Actuator: 24 V, 60 Hz, modulating, with position feedback.
5. Digital Controller: Application specific controller. Programming logic and calibration in nonvolatile EPROM. Controller uses generic 0 - 10 vdc inputs and outputs for interface to building automation system.
6. Air Straightener Section: 3 inches deep section contained in 5-inch-long sleeve attached to damper-airflow monitor frame.
7. Finish: Mill aluminum.

D. Performance Data:
1. Temperature Rating: Withstand -40 to 140 degrees F.
2. Accuracy: Plus or minus 5 percent.
3. Leakage: Maximum of 2.0 cfm per square foot at 1.0 inches wg pressure differential.
4. Measures from 15 percent to 100 percent of unit nominal air flow.

5. Adjusts air flow for temperature variations.
6. Provides 2 to 10 volt DC signal corresponding to actual air flow.

E. Provide baffles in mixing box for proper measurement.

2.10 CONTROLS

A. Controls: Refer to Sections 23 09 23.

2.11 CAPACITY – Refer to Schedule on Contract Drawings.

2.12 FACTORY TESTING

A. Factory test units at 6-inch wg positive operating pressure and 4-inch w.g. negative pressure to verify air volume and discharge static capability, casing leakage rate, acceptable velocity profiles at filters and coils, acceptable sound power levels at unit discharge and inlet and acceptable transmitted noise levels external to the unit.

B. Provide power, seals for unit inlet and outlet, and an approved unit discharge test duct to meet the requirements of the AMCA test standards.

C. Air volume and discharge static test must verify that air volume output is within the range of 100 to 110 percent of the scheduled nominal cfm requirements when operating at design external static pressure at the unit inlet and outlet. Air volume test must be per AMCA 210.

D. Casing leakage test must verify that the leakage rate does not exceed 1 percent of the unit rated supply volume at 100 percent of the deadhead fan static. Leakage tests must be conducted using the standard sealing system employed by the unit manufacturer. Temporary sealing methods such as caulking in the factory to meet test requirements are not acceptable.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install in accordance with ARI 430.

B. Install floor mounted units on concrete housekeeping pads at least 4 inches high and 6 inches wider than unit. Refer to Section 03 30 00.

C. Provide fixed sheaves required for final air balance.

D. Unit manufacturer must provide factory-trained service personnel that are employees of the manufacturer to supervise installation and start-up of the air handling units on the job site.

E. Insulate coil headers located outside airflow as specified for piping. Refer to Section 23 07 00.

F. Connect humidifiers to water supply. Install gate valve on water supply piping. Install 3/4 inch hose bibb accessible from interior. Pipe drain and overflow to nearest floor drain.

G. Install condensate piping with trap and route from drain pan to nearest floor drain.

3.3 INSTALLATION - REFRIGERANT COILS

A. Install sight glass in liquid line within 12 inches of coil. Refer to Section 23 23 00.

B. Install piping specialties in accordance with Section 23 23 00.

3.4 MANUFACTURER'S FIELD SERVICES

A. Furnish services of factory-trained representative for minimum of one (1) day to leak test, refrigerant pressure test, evacuate, dehydrate, charge, start-up, calibrate controls, and instruct the Commissioner on operation and maintenance.

3.5 CLEANING

A. Vacuum clean coils and inside of unit cabinet.

B. Install temporary filters during construction period. Replace with permanent filters at Substantial Completion.

3.6 DEMONSTRATION

A. Demonstrate unit operation and maintenance.

B. Furnish services of manufacturer's technical representative for one (1) hour day to instruct the City of New York’s personnel in operation and maintenance of units. Schedule instruction with the Commissioner, provide at least 7 days’ notice to the Commissioner of instruction date.

3.7 PROTECTION OF FINISHED WORK

A. Do not operate units until ductwork is clean, filters are in place, bearings lubricated and fan has been test run under observation.

END OF SECTION 23 73 00

SECTION 23 81 03 - PACKAGED, ROOFTOP AIR CONDITIONING UNITS - SMALL-CAPACITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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. Packaged rooftop air conditioning unit.
   2. Roof curb.

B. Related Sections:
   1. Section 23 09 23 - Direct-Digital Control System for HVAC: Controls remote from unit.
   2. Section 23 09 93 - Sequence of Operations for HVAC Controls: Sequences of operation applying to units in this section.
   3. Section 23 33 00 - Air Duct Accessories: Flexible connections.
   4. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Wiring Connections: Electrical connection to units
   5. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Wiring Connections: Electrical connection to units
   6. Section 26 05 33 - Raceway and Boxes for Electrical Systems: Wiring Connections: Electrical connection to units.

1.3 REFERENCES

A. Air-Conditioning and Refrigeration Institute:
   1. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
   2. ARI 270 - Sound Rating of Outdoor Unitary Equipment.
   3. ARI 340/360 - Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment.

B. Air Movement and Control Association International, Inc.:
   1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

C. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
   1. ASHRAE 52.1 - Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter.
   2. ASHRAE 62 - Ventilation for Acceptable Indoor Air Quality.
   3. ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings.

D. ASTM International:
   1. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.

E. National Fire Protection Association:
   1. NFPA 54 - National Fuel Gas Code.
   2. NFPA 58 - Liquefied Petroleum Gas Code.
   3. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.

1.4 DEFINITIONS

A. Energy Efficiency Ratio (EER) - Ratio of net cooling capacity in Btuh to total rate of electric input in watts under designated operating conditions.

B. Seasonal Energy Efficiency Ratio (SEER) - Total cooling output of an air conditioner during its normal annual usage period for cooling (in Btu) divided by total electric energy input during the same period (in Wh).

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit data indicating:
   1. Cooling and heating capacities.
   2. Dimensions.
   3. Weights.
   4. Rough-in connections and connection requirements.
   5. Duct connections.
   6. Electrical requirements with electrical characteristics and connection requirements.
   7. Controls.
   8. Accessories.

C. Test Reports: Submit results of factory test at time of unit shipment.

D. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

F. Manufacturer's Field Reports: Submit start-up report.

G. Project Record Documents: Record actual locations of controls installed remotely from units.

H. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, installation instructions, and maintenance and repair data.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Cooling Capacity: Rate in accordance with ARI 210/240

C. Sound Rating: Measure in accordance with ARI 270.

D. Insulation and adhesives: Meet requirements of NFPA 90A.

E. Performance Requirements: Conform to minimum EER prescribed by ASHRAE 90.1 when tested in accordance with ARI 210/240.

F. Outside Air Damper Leakage: Test in accordance with AMCA 500.

G. Perform Work in accordance with NYCBC.

H. Maintain one (1) of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Accept units on site. Inspect for damage.

B. Protect units from damage by storing off roof until roof mounting curbs are in place.

1.10 COORDINATION

A. Coordinate installation of roof curbs with roof structure, roof deck and roof membrane installation.

1.11 WARRANTY

A. Furnish five-year manufacturer warranty for rooftop unit compressor.

B. The air handler unit casing must be provided with a lifetime warranty against corrosion resistance under normal use.

1.12 GUARANTEE SERVICE

A. Furnish, service and maintenance of equipment for one (1) year from Date of Substantial Completion. Include maintenance items as shown in manufacturer's operating and maintenance data, including filter replacements, fan belt replacement, controls checkout and adjustments.

B. Furnish 24-hour emergency service on breakdowns and malfunctions for this guarantee period.

PART 2 - PRODUCTS

2.1 ROOFTOP AIR CONDITIONING UNITS

A. Manufacturers: Subject to compliance with the requirements, provide products by one of the following:
1. Annexair
2. Trane
3. York
4. Or approved equal

B. Product Description:
1. Self-contained, packaged, factory assembled and wired, consisting of cabinet, supply fan, refrigerant cooling coil, compressor, refrigeration circuit, condenser, gas-fired heating section, air filters, controls, and accessories.

C. Air Cooled Condensing Unit with Variable Speed Compressors:
1. Provide an integral air-cooled condensing section with variable speed compressors. The condensing section must be factory piped, wired, and charged with R-410A refrigerant. The section must be from the same manufacturer as the air handling unit. Factory mounting and piping an air-cooled condensing unit, provided by a third party is not acceptable. Furthermore, the exterior cabinet of the air-cooled section must be of the same construction and paint color as the air handling unit.
2. Compressors must be variable speed scroll type that can modulate from 25% to 100% capacity per compressor. Variable capacity compressors which do not modulate the speed of the scrolls are not considered equal to a variable speed scroll since they consume more energy at the same capacity output. Mechanically stepped scrolls which are unloaded via a digital signal to a solenoid valve, in a timed sequence, will not be acceptable for this application.
3. The variable speed scrolls must be operated via a factory supplied variable speed controller per compressor, and all tandem compressors will modulate in unison. Using a single variable speed controller on the lead circuit alone is not efficient during part load conditions, therefore will not be acceptable for this application.
4. Each compressor and controller assembly must be equipped with the following features:
   a. permanent magnet motor
   b. electronic expansion valve
   c. a crankcase heater function
   d. anti-short cycling
   e. built-in phase loss detector
   f. EMC filter
   g. oil return management system
   h. reverse rotation protection
5. All refrigeration parts, including the compressor and the speed controller will be located in a closed and vented service compartment, separate from the condenser coil airflow. Compressors located in compartments open to the outside are not acceptable. Compressors must be mounted on rubber isolators to limit vibration transmission and include flexible hoses on both the suction and discharge refrigeration lines. Flexible hoses must be pressure tested up to 620 psig. All air-cooled condensing units above 18 tons will have a minimum of two compressors. Condenser fans must have 7 air foil type blades with external mounted asynchronous motors that are class F insulated, IP54 and 100%

variable speed. Each condenser fan bank must be provided with a variable voltage controller which modulates via refrigerant head pressure control for superior part load performance. All the condenser fans in a fan bank must modulate in unison for each respective circuit. Staging condenser fans are not an acceptable mode of control for head pressure control. Protective guards must be included on all condenser fans, and condenser coils. The coil protective guards must be ideal to keep coil at maximum operating performance, protect the condenser from hail damage and allow for easy cleaning with quick release latches. The condenser coils must be micro-channel design for maximum efficiency performance, consist of a single pass arrangement with integral receiver, and be pressure tested at 650 psig.

6. Coil construction must consist of aluminum alloys for the fins, tubes and manifolds. Copper tube, aluminum fin condenser coils are not acceptable as they require more refrigeration charge for the same capacity output.
7. The following components must be included in each refrigeration circuit:
   a. Liquid line filter dryer,
   b. hi and low pressure switch,
   c. hi and low pressure transducers,
   d. suction and liquid lines shutoff valves
   e. suction line accumulators.
8. Refrigeration piping must use Shrader type connections for all components, including but not limited to valves and transducers. Under no circumstances must the units leave the factory without a complete run test and a copy of the QC report be provided upon request.

D. Configuration: As indicated on Drawings.

E. Roof Mounting Curb: Refer to architectural and structural drawings.

F. Housing:
1. The unit housing must be no-through metal with 2" Thermo-Composite and foam panel construction - interior and exterior or an all-aluminum 4" Foam thermal break construction - interior and exterior. Thermal break construction using a gasket to insulate two panels is not an acceptable equivalent to a no-through metal constructed casing. No-through metal construction will be inherent to all the component construction in the assembly. All panels and access doors must be double wall construction with R14 foam insulation for every 2" of construction. All foam insulation must be Greenguard certified. Any insulation incorporating CFCs or HCFCs in its construction is strictly prohibited from this application. Unit casing will have no exterior condensation at interior AHU temperatures down to 43F while unit exterior conditions are maintained at 95ºF dry bulb / 85ºF wet bulb. The air handling unit manufacturer's general construction must be tested to demonstrate the thermal performance of the unit casing. The test must include placing the entire test unit in a climate controlled environment and exposing the unit to the conditions mentioned previously. If the manufacturer does not have access to such equipment, an independent testing agent must be hired to transport the test unit to a qualified test facility, and perform the test at the expense of the manufacturer. Inability to provide this option to the Commissioner will make the manufacturer ineligible to bid on this project.
2. The panels must be tested in accordance with SMACNA and ASHRAE 111 to have a deflection of no more than L/1150 at 10" and withstand air pressures up to 8" w.c with less than 1% leakage. Fire resistance of the panel will be in compliance with UL 94 rated at 5VA; and a flame spread / smoke development in compliance with UL 723 ASTM E84 Class 1 rating.

3. Thermo-Composite or aluminum panels must be provided for the entire unit construction, including but not limited to, walls, doors, floors, roof, interior partitions, and electrical compartment. Panels must be non-load bearing type. The frame must consist of anodized extruded aluminum profiles which incorporates a thermally broken construction; welded together for reinforcement and insulated for superior thermal performance. Base structure must be fully welded G-90, painted exterior, and have integral lifting lugs which can be removed once the unit is installed. All roof and side wall seams must be positively sealed to prevent water and air leakage. The OA and EA compartment must have 1" PVC drains extended to exterior of unit.
4. Access doors must be provided to all major components to facilitate quick and easy access. Access doors will be made from the same material as the unit casing and must incorporate thermal break construction. Fan access door(s) must have L-handles, with one handle interlinking multiple latches and threaded insert fastening handles for all remaining doors. If access doors do not open against unit operating pressure, provide safety latches that allow access doors to partially open after first handle movement and fully open after second handle movement. Removable panels provided for equipment pull out for coil(s), and air to air heat exchanger section(s) must have key tooled threaded insert fasteners. Hinges must be Nylon hinge type designed to open 180 degrees.
5. Unit must have the entire exterior finished with a PVDF coating designed for UV resistance. Panels must be painted the manufacturer's standard color white gray RAL 9002. If custom color is required, please specify the associated RAL color code. Panels must pass ASTM B117 3000-hour salt fog resistance test and ASTM D4585 3000-hour moisture condensation resistance test. In addition, paint must meet AAMA 620-02 standard for color, chalking, gloss retention, and abrasion resistance.

G. OA Weather Hood:
1. The outdoor intake weather hood will be completely constructed in aluminum for superior corrosion resistance. The hood must be shipped loose for field installation by the installing contractor. Painted galvanized hoods will not be acceptable due to its susceptibility to corrosion. The outdoor air hood must be designed with a 4" extruded aluminum louver, bird screen and a plenum enclosure with drain holes. The louver blades must be drainable type with a maximum 45 degree angle and curved with integral rain baffle. The louver design must not allow more than 0.03 oz/ft2 water penetration when tested in accordance with AMCA 500. The pressure drop of the complete hood assembly must not exceed 0.05" wc at a maximum 500 fpm face velocity. A Pre-filter rack system must be installed within the weather hood enclosure to prevent outdoor air dust and debris from entering the damper and unit casing plenum. Pre-filters installed inside the unit casing plenum and downstream of the outdoor damper will not be acceptable as this will increase overall maintenance on the damper, reduce indoor air quality and promote mold and bacteria growth. Filter access in the hood must be accomplished via the louver that is installed with a stainless steel piano hinge and spring loaded latch. No tools or ladders must be required to access the pre-filters in the weather hood assembly.
2. The exhaust air outlet louvers must be 2" extruded aluminum, with non- restricting blade design and bird screen

H. Fans:
1. The fans must be carefully positioned and installed at an optimal distance to respect uniform airflow across the heat exchanger & coil(s).
2. Plenum Fans ER model: Fans must be direct drive radial centrifugal fans with free running impeller. No fan belts will be acceptable for this application. Fans must be compact, optimized and construction made of galvanized sheet steel with backward curved 7-blade high efficiency impeller, protected by an epoxy powder coating. To reduce vibration, the impeller must be balanced with hub

to an admissible vibration severity of less than 2.8 mm/s in conformity with DIN ISO 14694 and proof must be supplied for each individual impeller. Tests must be made according to DIN ISO 1940 Part 1, quality of balancing G2.5/6.3. The single inlet must be mounted onto constant speed direct drive motor, equipped with an air flow optimized inlet cone from galvanized sheet steel. Fans must be completely certified as per ISO 5801 and in accordance with AMCA standards. Fan/ fan bank will require to be operated by a Variable speed drive or one VFD per fan must be provided w/Backdraft Isolation damper at the event of a fan failure. Plenum fan must come equipped with guard grilles for the air intake side.

3. The fan housing and motor assembly must be isolated from the unit cabinetry with a minimum 95% efficient isolators. Fan(s) must have flexible duct canvas and galvanized spring isolators. Painted isolators are unacceptable. Heavy duty Seismic rubber isolators for all fan sizes.

I. Sound Attenuation In Fan Compartment:
   1. The fan section must be constructed with a perforated interior liner, same construction as the housing interior lining and must be insulated with Permacote anti-microbial coating fiber glass. The perforated lining must be installed on fixed panels only, with exception on the interior ceiling

J. Fan Motors:
   1. The fan motors must meet NEMA standard dimensions and comply with the Energy policy Act of 1997. Motors must have premium efficiencies with low noise and vibration output. Motors must be certified and were built in accordance with ISO 9001 quality control system. Motors must have TEFC enclosure with Premium efficiency performance.
   2. A shaft grounding brush kit will be provided to prevent electrical damage to motor bearings by safely channeling harmful shaft currents to ground.

K. DX Coils:
   1. Coils must be factory installed in the unit. Coils must be designed with respective circuits to match the design requirements. All coils must have a distributor per circuit connection. Primary surface must be round seamless (3/8" O.D.) copper tube staggered in the direction of airflow. Secondary surface must consist of rippled aluminum plate fins for higher capacity and structural strength. Fins must have full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Tubes must be mechanically expanded into the fins to provide a continuous primary to secondary compression bond over the entire finned length for maximum heat transfer rates.
   2. Casing must be constructed of continuous stainless steel. Coils must be circuited for counter-flow heat transfer to provide maximum mean effective temperature difference for maximum heat transfer rates. Headers must have intruded tube holes to provide a large brazing surface for maximum strength and inherent flexibility.
   3. The complete coil must be tested with 315 pounds air pressure under warm water and be suitable for operation at 250 psig working pressures. Maximum finned coil height must be 60" and must not exceed 500 FPM face velocity.
   4. Drain pan must be provided on cooling coils. Cooling coils must sit on stainless steel tubular support rails, which will stand a minimum of (2) two inches above the highest point of the floor drain pan. Stacked coils must be provided for larger airflows and intermediate drain pans must be provided for each coil bank. Drain pans must be stainless steel with 1.25" stainless steel drain connections on one side only. Pan must be sloped in two planes.

L. Compressor: Hermetically sealed, resiliently mounted with positive lubrication, and internal motor overload protection. Furnish internal vibration isolators, short cycle protection.

M. Refrigeration circuit: Furnish each circuit with thermal expansion valve, filter-drier, suction, discharge, and liquid line service valves with gauge ports, high and low pressure safety controls. Dehydrate and factory charge each circuit with oil and refrigerant.

N. Condenser:
1. Coil: Copper tube copper fin coil assembly. Factory leak tested under water. Furnish coil with corrosion resistant coating capable of withstanding salt spray test of 1000 hours in accordance with ASTM B117.
2. Condenser Fan: Direct drive propeller fans statically and dynamically balanced. Wired to operate with compressor. Motor permanently lubricated with built-in thermal overload protection.

O. Indirect Gas Fired Duct Furnace:
1. Furnish and install where shown on plans Gas-fired Duct Furnace Heat Module(s). The module must be a Recognized Component by Intertek Testing Services (ITS / ETL).
2. All modules will have a minimum thermal efficiency of 80%. The module must employ a tubular heat exchanger and a draft inducer assembly to provide for positive venting of flue gases.
3. Burner assemblies must employ in-shot type burners constructed of aluminized steel body and sintered metal flame holder with integral carryover plenum. Each burner will have an input up to 50,000 Btuh. The ignition system will include a 6000 V Igniter and flame rod detection. Ceramic hot surface ignition systems are unacceptable.
4. Gas-fired duct furnace(s) provided must employ a tubular heat exchanger constructed of 18-gauge minimum, type 409 stainless steel, and 1 ¾" to 2 ¼" diameter having a minimum wall thickness of 0.047". Tubes must be produced to ASTM A249 standards for heat exchanger application. Tubes must employ integral formed-dimple restrictors to eliminate noise associated with expansion and contraction of internal baffles during heating cycles, and to provide for unobstructed drainage of condensate that occurs in the tubes during cooling operation. Drainage must be configured so that burners and burner surfaces are not exposed to condensate during cooling system operation.
5. Full Modulation control must be provided. On a call for heat and subsequent safe burner light OFF, the burner firing rate is controlled between 20% and 100% of full rated capacity. The modulation will be continuous between 20% and 100%; "stepped" modulation is not acceptable. Controls must include an ignition control with alarm capable contact and one hour auto reset on lockout, roll out switch, high limit switch and a proving switch of loss of the induced draft fan. Additionally, on modulating and 2-stage systems all timing and switching functions must be controlled through an electronic timer relay control. Staging controller available for 0 to 10VDC or 4 to 20mA input from building management control.
6. Burners will use Natural Gas (with gas pressure min 7"-max 14' 'wc) unless otherwise specified. Gas train compartment must be provided with a 1" PVC drain.

P. Pre-Filters:
1. Filters must be factory installed upstream of the heat exchanger and coils, in the supply airstream. The filters will be Aerostar Series 400, 2" MERV 8, Camfill, Honeywell or approved equal.
2. Each filter must consist of 100% synthetic media, expanded metal on the downstream and enclosing with high wet-strength beverage board with diagonal support bonded on air entering and air exiting side of each pleat. MERV 8, UL 900. The filter must be operated at 500 FPM, surface area 18 FT2

of media based on 24 x 24 x 2 initial static pressure at 0.24", final will be 1". Filters must be placed in a completely sealed, galvanized holding frame.

Q. Final Filters:
1. Filters must be factory installed upstream of the heat exchanger and coils. The air filters must be 4" MERV 13.
2. Each filter must consist of 100% synthetic gradient dual density media, in a 100% high impact plastic frame. Media is adhesively bonded to all four sides of the frame.
3. MERV 13 could be operated at 492 FPM, surface area 50 FT2 of media based on 24 x 24 x 2 initial static pressure at 0.36", final will be 1.5". Filters must be placed in a completely sealed, galvanized holding frame with quick release latches for easy replacement.

R. Mixed Air Casing:
1. Outside Air Damper Leakage: Maximum 3.0 cfm per square foot at 1.0 inches wg pressure differential.
2. Outside Air Damper: Automatic, two position (spring return). Interlocked to open when supply fan starts. Outside air damper normally closed and return air damper normally open. Furnish rain hood with screen.

S. Controls:
1. Furnish control to provide low ambient cooling to 0 degrees F.
2. Furnish low limit thermostat in supply air to close outside air damper and stop supply fan.
3. Furnish terminal strip on unit for connection of operating controls to remote BMS panel.
4. Control and Status Panel: Furnish, for integration to remote BMS panel, the following control and status indications:
    a. Cooling mode.
    b. Heating mode.
    c. Compressor 1.
    d. Compressor 2.
    e. Heating stage 1.
    f. Heating stage 2.
    g. Heating failure.
    h. Dirty filters.
    i. Fan only operation.
    j. Remote damper control.
    k. Low limit manual reset.
5. Furnish interface to Building Management Control System.
6. Microprocessor Based Controls:
    a. Factory mounted with the following features:
        1) Monitor each mode of operation.
        2) Evaporator fan status.
        3) Filter status.
        4) Supply air temperature.
        5) Outdoor air temperature.
    b. Diagnostics for BMS commands for staged heating, staged cooling, and fan operation.

T. Accessories:
   1. Convenience Outlet: Factory installed, 115 volt, 15 amp, GFCI type, internally mounted.
   2. Roof Curb Adaptor Package: Furnish duct support hardware to adapt unit to existing roof curb.

U. Capacity: As Scheduled on drawings.

V. Sound Levels: Not to exceed values scheduled on drawings.

2.2 ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. Electrical Characteristics: As scheduled on drawings.

B. Disconnect Switch: Factory mounted, non-fused type, interlocked with access door, accessible from outside unit, with power lockout capability.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify roof curbs are installed and dimensions are as shown on shop drawings.

3.3 INSTALLATION

A. Roof Curb:
   1. Coordinate curb installation and flashing.
   2. Install units on roof curb providing watertight enclosure to protect ductwork and utility services.
   3. Install gasket material between unit base and roof curb.

B. Connect units to supply and return ductwork with flexible connections. Refer to Section 23 33 00.

C. Install condensate piping with trap and route from drain pan to nearest roof drain.

D. Install components furnished loose for field mounting.

E. Install electrical devices furnished loose for field mounting.

F. Install control wiring between unit and field installed accessories.

G. Locate remote Direct Digital Control panels as indicated on Drawings.

3.4 INSTALLATION - NATURAL GAS HEATING SECTION

A. Connect natural gas piping in accordance with NFPA 54.

B. Connect natural gas piping to unit, full size of unit gas train inlet. Arrange piping with clearances for burner service.

C. Install the following piping accessories on natural gas piping connections:
1. Strainer.
2. Pressure gage.
3. Shutoff valve.
4. Pressure reducing valve.

D. Install natural gas piping accessories within unit casing.

3.5 MANUFACTURER'S FIELD SERVICES

A. Furnish initial start-up and shutdown during first year of operation, including routine servicing and checkout.

3.6 CLEANING

A. Vacuum clean coils and inside of unit cabinet.

B. Install new filters in units at Substantial Completion.

3.7 DEMONSTRATION

A. Demonstrate unit operation and maintenance.

B. Furnish services of manufacturer's technical representative for one 8-hour day to instruct the City of New York’s personnel in operation and maintenance of units. Schedule instructions with the Commissioner. Provide at least 7 days’ notice to the Commissioner of the instructing date.

3.8 SCHEDULES

A. See drawing M-401.00

END OF SECTION 23 81 03

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SECTION 23 81 26 - SPLIT-SYSTEM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Air handling unit.
   2. Condensing unit.

B. Related Sections:
   1. Section 03 30 00 - Cast-In-Place Concrete: Execution requirements for concrete foundations specified by this section.
   2. Section 23 05 48 - Noise and Vibration Controls for HVAC Piping and Equipment: Product requirements for Vibration Isolation for placement by this section.
   3. Section 23 09 23 - Direct-Digital Control System for HVAC: Controls remote from unit.
   4. Section 23 09 93 - Sequence of Operations for HVAC Controls: Sequences of operation applying to units in this section.
   5. Section 23 23 00 - Refrigerant Piping: Execution requirements for connection to refrigerant piping specified by this section.
   6. Section 23 33 00 - Air Duct Accessories: Flexible connections.
   7. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Wiring Connections: Electrical connection to units
   8. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Wiring Connections: Electrical connection to units
   9. Section 26 05 33 - Raceway and Boxes for Electrical Systems: Wiring Connections: Electrical connection to units.

1.3 REFERENCES

A. Air-Conditioning and Refrigeration Institute:
   1. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
   2. ARI 270 - Sound Rating of Outdoor Unitary Equipment.
   3. ARI 340/360 - Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment.
   4. ARI 365 - Commercial and Industrial Unitary Air-Conditioning Condensing Units.

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
   1. ASHRAE 52.1 - Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter.
   2. ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings.

C. ASTM International:
   1. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.

D. National Electrical Manufacturers Association:
   1. NEMA MG 1 - Motors and Generators.

E. National Fire Protection Association:
   1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit data indicating:
   1. Cooling and heating capacities.
   2. Dimensions.
   3. Weights.
   4. Rough-in connections and connection requirements.
   5. Duct connections.
   6. Electrical requirements with electrical characteristics and connection requirements.
   7. Controls.
   8. Accessories.

C. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements and are approved for New York City installation.

E. Manufacturer’s Field Reports: Submit start-up report for each unit.

F. Manufacturer computerized refrigerant tubing sizing calculations.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of controls installed remotely from units.

B. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, installation instructions, and maintenance and repair data.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Performance Requirements: Energy Efficiency Rating (EER) not less than prescribed by ASHRAE 90.1 when used in combination with compressors and evaporator coils when tested in accordance with ARI 210/240 and ARI 340/360.

C. Cooling Capacity: Rate in accordance with ARI 210/240 and ARI 340/360.

D. Sound Rating: Measure in accordance with ARI 270.

E. Insulation and adhesives: Meet requirements of NFPA 90A and ASTM G-21/22.

F. Perform Work in accordance with NYCBC.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience properly trained by manufacturer.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Accept units and components on site in factory protective containers, with factory shipping skids and lifting lugs. Inspect for damage.

B. Comply with manufacturer's installation instruction for rigging, unloading and transporting units.

C. Protect units from weather and construction traffic by storing in dry, roofed location.

1.10 COORDINATION

A. Coordinate installation of condensing units with concrete pad roof structure.

B. Coordinate installation of air handling units with building structure.

1.11 WARRANTY

A. Furnish five-year manufacturer’s warranty for compressors.

1.12 GUARANTEE SERVICE

A. Furnish service and maintenance of equipment for one (1) year from Date of Substantial Completion. Include maintenance items as shown in manufacturer's operating and maintenance data, including filter replacements, fan belt replacement, and controls checkout and adjustments.

PART 2 - PRODUCTS

2.1 SPLIT SYSTEM AIR CONDITIONING UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Carrier Corp.
2. Mitsubishi
3. McQuay International
4. The Trane Company
5. York International
6. Or approved equal

B. Furnish materials in accordance with NYCBC.

C. Product Description: Split system consisting of air handling unit and condensing unit including cabinet, evaporator fan, refrigerant cooling coil, compressor, refrigeration circuit, condenser, electric heating coil, hot water heating coil, steam heating coil, air filters, controls, air handling unit accessories, condensing unit accessories, and refrigeration specialties.

2.2 AIR HANDLING UNIT

A. Configuration: As indicated on Drawings.

B. Cabinet:
1. Panels: Constructed of galvanized steel with baked enamel finish. Access Panels: Located on both sides of unit. Furnish with duct collars on inlets and outlets.
2. Insulation: Factory applied to each surface to insulate entire cabinet. 1/2 inch thick neoprene coated glass fiber with edges protected from erosion.

C. Evaporator Fan: Forward curved centrifugal type, resiliently mounted with adjustable belt drive and high efficiency motor complying with NEMA MG1, Type 1. Motor permanently lubricated with built-in thermal overload protection. Furnish oversize motor for high static pressure systems.

D. Evaporator Coil: Constructed of copper tubes expanded onto aluminum fins. Factory leak tested under water. Removable, Steel, double-sloped drain pan with piping connections on both sides.

E. Refrigeration System: Single or Dual refrigeration circuits controlled by factory installed thermal expansion valve.

F. Electric Heating Coil: Helical nickel-chrome resistance wire coil heating elements with refractory ceramic support bushings easily accessible with automatic reset thermal cut-out, built-in contactors, galvanized steel frame, control circuit transformer and fuse, air flow proving device load fuses. Number of stages or SCR control as indicated on Drawings.

G. Air Filters: 1-inch thick UL Class 1 glass fiber disposable media in metal frames. 25 to 30 percent efficiency based on ASHRAE 52.1.

H. Air Handling Unit Accessories:
1. Discharge Plenum: with construction and finish matching unit casing. Integral grille of aluminum construction and adjustable louvers.
2. Return Air Grille: mounted in return air opening of aluminum construction and fixed louvers.
3. Mounting Subbase with construction and finish matching unit casing.
4. Vibration Isolators: Spring type.

2.3 CONDENSING UNIT

A. General: Factory assembled and tested air-cooled condensing units, consisting of casing, compressors, condensers, coils, condenser fans and motors, and unit controls.

B. Unit Casings: Exposed casing surfaces constructed of galvanized steel with manufacturer's standard baked enamel finish. Designed for outdoor installation and complete with weather protection for components and controls, and complete with removable panels for required access to compressors, controls, condenser fans, motors, and drives.

C. Compressor: Single refrigeration circuit or two independent refrigeration circuits with rotary semi-hermetic reciprocating type compressors, resiliently mounted, with positive lubrication, and internal motor overload protection.

D. Condenser Coil: Constructed of copper tubing mechanically bonded to aluminum fins, factory leak and pressure tested.

E. Controls: Furnish operating and safety controls including high and low pressure cutouts. Control transformer. Furnish magnetic contactors for compressor and condenser fan motors.

F. Condenser Fans and Drives: Direct drive propeller fans statically and dynamically balanced. Wired to operate with compressor. Permanently lubricated ball bearing type motors with built-in thermal overload protection. Furnish high efficiency fan motors.

G. Condensing Unit Accessories: Furnish the following accessories:
1. Controls to provide low ambient cooling to 0 degrees F.
2. Time delay relay.
3. Anti-short cycle timer.
4. Disconnect switch.
5. Vibration isolators.
6. Hot gas bypass kit.
7. Coil with corrosion resistant coating capable of withstanding salt spray test of 1000 hours in accordance with ASTM B117.
8. Condenser Coil Guard: Condenser fan openings furnished with PVC coated steel wire safety guards.
9. Suction and discharge pressure gauges.

H. Refrigeration specialties: Furnish the following for each circuit:
1. Charge of compressor oil.
2. Holding charge of refrigerant.
3. Replaceable core type filter drier.
4. Liquid line sight glass and moisture indicator.
5. Shut-off valves on suction and liquid piping.
6. Liquid line solenoid valve.
7. Charging valve.
8. Oil level sight glass.
9. Crankcase heater.
10. Hot gas muffler.
11. Pressure relief device.

I. Refrigerant must be R-410a. Furnish charge of refrigerant.

2.4 CONTROLS

A. Thermostat: Remote space thermostat with single-stage heating and two-stage cooling with automatic changeover. Furnish system selector switch and fan control switch auto-on.

B. Thermostat: 7-day programmable electronic space thermostat with single-stage heating and two-stage cooling with automatic changeover and heating setback and cooling setup capability. Furnish system selector switch and fan control switch, auto-on.

C. Furnish interface to Direct Digital Control System specified in Section 23 09 23.

2.5 CAPACITY – as indicated on Contract Schedules.

A. Electrical Characteristics and Components:
1. Electrical Characteristics: In accordance with Division 26 as scheduled on Contract Drawings.

B. Disconnect Switch: Factory mounted, non-fused type, interlocked with access door, accessible from outside unit, with power lockout capability.

2.6 ACCESSORIES

A. Condensate Pump:
1. A condensate pump must be factory installed within the air handling unit for automatic removal of condensate and humidifier flush water.
2. The condensate pump must include an internal overflow safety float switch which, when wired to the A/C's remote stop/start terminals, must open the A/C's control circuit, thereby shutting the A/C down in the event of a condensate overflow.
3. The condensate pump must be specifically designed to operate with the higher pump head not less than 25 feet.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify concrete pad for condensing unit is ready for unit installation.

3.3 INSTALLATION - AIR HANDLING UNIT

A. Install air handling units on supplemental steel with vibration isolators for suspended units. Refer to Section 23 05 48. Provide detail to be approved by the Commissioner.

B. Install floor-mounted units on concrete housekeeping pads at least 3-1/2 inches high and 6 inches wider than unit. Refer to Section 03 30 00.

C. Connect air handling units to supply and return ductwork with flexible connections. Refer to Section 23 33 00.

D. Install condensate piping with trap and route from drain pan to condensate drainage system.

E. Install components furnished loose for field mounting.

F. Install connection to electrical power wiring in accordance with Division 26.

G. Installation - Hot Water Heating Coil:
   1. Make connections to coils with unions or flanges.
   2. Connect water supply to leaving airside of coil (counter flow arrangement).
   3. Locate water supply at bottom of supply header and return water connection at top.
   4. Install water coils to allow draining and install drain connection at low points.
   5. Install the following piping accessories on hot water piping connections.
      a. On supply:
         1) Thermometer well and thermometer.
         2) Well for control system temperature sensor.
         3) Shutoff valve.
         4) Strainer.
         5) Control valve.
         6) Pressure gage.
      b. On return:
         1) Thermometer well and thermometer.
         2) Well for temperature sensor.
         3) Pressure gage.
         4) Shutoff valve.
         5) Flow control valve.
   6. Install valves and piping specialties as indicated on Drawings.
   7. Install automatic air vents at high points complete with shutoff valve.

H. Install Work in accordance with NYCBC.

3.4 INSTALLATION - CONDENSING UNIT

A. Install condensing units on vibration isolators. Refer to Section 23 05 48.

B. Install units on concrete foundations. Refer to Section 03 30 00.

C. Install refrigerant piping from unit to condensing unit. Install refrigerant specialties furnished with unit. Refer to Section 23 23 00.

D. Evacuate refrigerant piping and install initial charge of refrigerant.

E. Install electrical devices furnished loose for field mounting.

F. Install control wiring between air handling unit, condensing unit, and field installed accessories.

G. Install connection to electrical power wiring in accordance with Division 26.

H. Install Work in accordance with NYCBC.

3.5 MANUFACTURER'S FIELD SERVICES

A. Furnish initial start-up and shutdown during first year of operation, including routine servicing and checkout.

3.6 CLEANING

A. Vacuum clean coils and inside of unit cabinet.

B. Install temporary filters during construction period. Replace with permanent filters at Substantial Completion.

3.7 DEMONSTRATION

A. Demonstrate air handling unit operation and maintenance.

B. Demonstrate starting, maintenance and operation of condensing unit including low ambient temperature operation.

C. Furnish services of manufacturer's technical representative for one-hour day to instruct the City of New York’s personnel in operation and maintenance of units. Schedule instruction with the City of New York’s personnel. Provide at least 7 days’ notice to the Commissioner of instruction date.

3.8 PROTECTION OF FINISHED WORK

A. Do not operate air handling units until ductwork is clean, filters are in place, bearings lubricated and fan has been test run under observation.

END OF SECTION 23 81 26

SECTION 23 82 00 - CONVECTION HEATING AND COOLING UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Unit heaters.
   2. Cabinet unit heaters.
   3. Electric unit heaters.

B. Related Sections:
   1. Section 23 05 13 - Common Motor Requirements for HVAC Equipment: Product requirements for motors for placement by this section.
   2. Section 23 07 00 - HVAC Insulation: Execution requirements for insulation specified by this section.
   3. Section 23 31 00 - HVAC Ducts and Casings: Execution requirements for ducts specified by this section.
   4. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Wiring Connections: Execution requirements for electric connection to units as specified.
   5. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Wiring Connections: Execution requirements for electric connection to units as specified.
   6. Section 26 05 33 - Raceway and Boxes for Electrical Systems: Wiring Connections: Execution requirements for electric connection to units as specified.
   7. Section 26 27 26 - Wiring Devices: Wiring Connections: Execution requirements for electric connection to units as specified.

1.3 REFERENCES

A. Air-Conditioning and Refrigeration Institute:
   1. ARI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils.

B. Sheet Metal and Air Conditioning Contractors:
   1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

C. UL.

D. NEC and NYCEC.

1.4 SUBMITTALS

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate cross sections of cabinets, grilles, bracing and reinforcing, and typical elevations. Indicate schedules of equipment and enclosures typically indicating length and number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors and pilaster covers.

C. Product Data: Submit coil and frame configurations, dimensions, materials, rows, connections, and rough-in dimensions. Submit mechanical and electrical service locations, capacities and accessories or optional items.

D. Samples: Submit one sample of each radiation cabinet detailed.

E. Manufacturer's Installation Instructions: Submit assembly, support details, and connection requirements.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of components and locations of access doors in radiation cabinets required for access to valves.

B. Operation and Maintenance Data: Submit manufacturer’s descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listings.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Perform Work in accordance with NYCBC.

C. Maintain one (1) copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years documented experience properly trained by manufacturer.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Accept units on site in factory packing. Inspect for damage. Store under roof.

B. Protect coil fins from crushing and bending by leaving in shipping cases until installation, and by storing indoors. Protect coils from entry of dirt and debris with pipe caps or plugs.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 UNIT HEATERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. QMark
   2. Trane
   3. Berko
   4. Or approved equal.

B. Coils: Seamless copper tubing, 0.025 inch minimum wall thickness, silver brazed to steel headers, and with evenly spaced aluminum fins mechanically bonded to tubing.

C. Casing: 0.0478-inch thick steel with threaded pipe connections for hanger rods.

D. Finish: Factory applied baked primer of custom color to be selected by the Commissioner.

E. Fan: Direct drive propeller type, statically and dynamically balanced, with fan guard; horizontal models with permanently lubricated sleeve bearings; vertical models with grease lubricated ball bearings.

F. Air Outlet: Adjustable pattern diffuser on projection models and four-way louvers on horizontal throw models.

G. Motor: Permanently lubricated sleeve bearings on horizontal models, grease lubricated ball bearings on vertical models. Refer to Section 23 05 13.

H. Control: Local multi-speed disconnect switch and integral return air thermostat.

I. Capacity: As scheduled, based on 65 degrees F entering air temperature.

J. Electrical Characteristics: Refer to Contract Drawings.

2.2 CABINET UNIT HEATERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. QMark
   2. Trane
   3. Berko
   4. Or approved equal

B. Coils: Enclosed copper tube, aluminum finned element of coiled nickel-chrome resistance wire centered in tubes and embedded in refractory material.

C. Cabinet: 0.0598 inch thick steel with exposed corners and edges rounded, easily removed panels, glass fiber insulation and integral air outlet and inlet grilles.

D. Finish: Factory applied baked enamel of custom color as selected by the Commissioner on visible surfaces of enclosure or cabinet.

E. Fans: Centrifugal forward-curved double-width wheels, statically and dynamically balanced, direct driven.

F. Motor: Tap wound multiple speed permanent split capacitor with sleeve bearings, resiliently mounted.

G. Control: Multiple speed switch, factory wired, located in cabinet. Provide return air thermostat and local disconnect switch.

H. Filter: Easily removed 1 inch thick glass fiber throw-away type, located to filter air before coil.

I. Mixing Dampers: Where indicated, mixing sections with dampers.

J. Capacity: As Scheduled, based on 65 degrees F entering air temperature.

K. Electrical Characteristics: Refer to Contract Drawings.

2.3 ELECTRIC UNIT HEATERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. QMark
2. Trane
3. Berko
4. Or approved equal

B. Assembly: UL listed and labeled assembly with terminal box and cover, and built-in controls.

C. Heating Elements: Enclosed copper tube, aluminum finned element of coiled nickel-chrome resistance wire centered in tubes and embedded in refractory material.

D. Cabinet: 0.0478-inch thick steel with easily removed front panel with integral air outlet and inlet grilles.

E. Element Hangers: Quiet operating, ball bearing cradle type providing unrestricted longitudinal movement, on enclosure brackets.

F. Fan: Direct-drive propeller type, statically and dynamically balanced, with fan guard.

G. Motor: Permanently lubricated, sleeve bearings for horizontal models; ball bearings for vertical models.

H. Control: Separate fan speed switch and thermostat heat selector switch, factory wired, with switches built-in behind cover. Furnish thermal overload. Provide integral disconnect switch and return air thermostat.

I. Electrical Characteristics: Refer to Contract Drawings.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. For recessed units, verify recess dimensions are correct size.

B. Verify wall construction is ready for installation.

C. Verify concealed blocking and supports are in place and connections are correctly located.

3.3 INSTALLATION

A. Protect coils to prevent damage to fins and flanges. Comb out bent fins.

B. On water coils, install shut-off valve on supply piping and lockshield balancing valve on return piping. Locate water supply at bottom of supply header and return water connection at top. Install manual air vents at high points complete with stop valve. Install water coils to be drainable and install drain connection at low points. Refer to Section 23 21 13.

C. Insulate headers located outside airflow, insulate as specified for piping. Refer to Section 23 07 00.

D. Wire electric duct coils. Refer to Division 26.

E. Install equipment exposed to finished areas after walls and ceilings are finished and painted. Avoid damage.

F. Protection: Install finished cabinet units with protective covers during remainder of construction.

G. Unit Heaters: Hang from building structure, with pipe hangers anchored to building, not from piping. Mount as high as allowed by manufacturer to maintain greatest headroom unless otherwise indicated.

H. Cabinet Unit Heaters: Install at locations as indicated on Drawings. Coordinate to assure correct recess size for recessed units.

I. Install electric heating equipment including devices furnished by manufacturer but not factory mounted. Furnish copy of manufacturer's wiring diagram submittal. Install electrical wiring in accordance with manufacturer's submittals and Division 26.

3.4 CLEANING

A. After construction is completed, including painting, clean exposed surfaces of units. Vacuum clean coils and inside of cabinets.

B. Touch-up marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.

END OF SECTION 23 82 00

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SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:
   1. General requirements for Electrical Work.

1.3 DIVISION OF RESPONSIBILITY

A. The requirements under Section 26 05 00 are intended for the party or parties who have been duly awarded the applicable portion of work to be performed under the indexed sections of Division 26 also known as the Electrical Work.

B. In addition to electrical work required under Division 26, the scope of electrical work specified under Division 26 will include the provision of all required power wiring to the equipment specified under Division 23. Provide power to all motors, electric heaters, light fixtures, heat tracing equipment, control panels, electrically actuated valves, dampers, and other devices, specified under the various sections of the Divisions indicated.

1.4 MEASUREMENTS

A. Base all the measurements, both horizontal and vertical from established benchmarks. All work must agree with these established lines and levels. Verify all measurements at site; and check the correctness of same as related to the work.

1.5 LABOR AND MATERIALS

A. All materials and apparatus required for the work will be new, of first-class quality, and must be furnished, delivered, erected, connected and finished in every detail, and must be so selected and arranged as to fit properly into the building spaces.

B. Contractor must remove all materials delivered, or work erected, which does not comply with Contract Drawings and Specifications, and replace with proper materials, or correct such work as directed, at no additional cost to the City of New York.

1.6 COVERING OF WORK

A. No electrical equipment, raceways or other work of any kind must be covered up or hidden from view before it has been examined by the Commissioner. Any unsatisfactory or imperfect work or materials that may be discovered must be removed and corrected immediately.

1.7 PROTECTION

A. Contractor must protect the work and material of all trades from damage by the work or workmen, and must replace all damaged material with new.

B. Contractor must be responsible for work and equipment until the work is finally inspected, tested and accepted; must protect the work against theft, injury or damage; carefully store material and equipment received on site which is not immediately installed; close open ends of work with temporary covers or plugs during construction to prevent entry of obstructing material.

C. Contractor must be responsible for the preservation of all public and private property, along and adjacent to the work, and must use every precaution necessary to prevent damage or injury thereto. The Contractor must use suitable precautions to prevent damage to pipes, conduits and other underground structures or utilities, and must carefully protect from disturbance or damage all property marks until the Commissioner has witnessed or otherwise referenced the location, and must not remove them until directed.

D. All electrical equipment delivered to the site must have appropriate wrapping to protect them from rain, flood, wind, construction debris and all types of water damage normally encountered at construction sites. Protection of equipment such as switchboard, transformers, panelboards, luminaires and similar equipment will be the responsibility of the Contractor receiving such equipment at the jobsite for installation under Sections 26 24 16 - Panelboards, 26 27 26 - Wiring Devices, 26 28 13 - Fuses, 26 51 00 - Interior Lighting and 26 52 00 - Safety Lighting.

1.8 CUTTING AND PATCHING

A. Provide all cutting and rough patching required for systems and equipment included in these specifications. All finish patching will be done under General Construction work.

B. Furnish and locate all sleeves and inserts required before the floors and walls are built; Contractor must pay the cost of cutting and patching required for pipes where sleeves and inserts were not installed in time, or where incorrectly located. Provide all drilling required for the installation of hangers.

C. All holes cut through concrete slabs or arches must be punched or drilled from the underside. No structural members will be cut without the approval of the Commissioner and all such cutting must be done in a manner as directed by the Commissioner.

D. Contractor must not do any cutting that may impair strength of building construction. No holes, except for small screws, may be drilled in beams or other structural members without obtaining prior approval. All work must be done in a neat manner by mechanics skilled in their trades and as approved.

E. Provide sleeves and fire stopping at piping penetrations in floor, wall and roof.

1.9 SUBMITTAL PROCEDURE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Shop Drawings:
   1. Manufacturer's Drawings:

a. Submit equipment listed in all applicable Sections - include material specifications, operating characteristics and finishes, specified agency listings or approvals.
b. Cuts, brochures or other literature submitted for expeditious approval but incomplete or missing items of hardware or software (performance data) must be re-submitted until all system or equipment components have been reviewed and approved. Any item not included in the original or first submission will be considered outstanding work until such item of equipment or work has been submitted or installed in place exactly conforming to the intent of the contract documents.
c. Contractor must provide preliminary layout drawings of all major pieces of equipment (i.e., Switchgear, switchboards, transformers), confirming that the submitted product physically fits within the architectural enclosures. This drawing is required along with the manufacturer's product data.

2. Installation Drawings:
a. Furnish coordinated drawings of equipment installation, including interconnecting conduit and supports. Minimum scale for these drawings must be 1/4 inch equals one foot.
b. Coordinate space requirements for mechanical, plumbing and other trades in the vicinity of work.
c. Include connections, anchorages and fastenings for equipment and conduit.
d. Make allowance for clearances for access to and maintenance of equipment.
e. Do not install any conduits or equipment, in any area, prior to obtaining approval of its layout by means of submitting shop drawings.
f. Any missing items of equipment, material or labor, during initial submission of shop drawings, are to be completed and re-submitted for final approval. Shop drawing should not be used as a vehicle for obtaining variances, deviation or omission from the scope of Contract Documents. Approval of a submittal must pertain to the portions that conform to the intent of the Contract Documents.
g. Submission of any missing, incomplete or otherwise deviant layout is subject to re-submission until all contract requirements have been properly included or shown on the same layout.

C. Required Samples:
1. Color samples, for prefinished items.
2. Natural finish metals, for quality of finish.

D. Reports:
1. Compliance with listings and approvals for equipment and for fire ratings.
2. Acceptance certificates from inspecting agencies.
3. Complete printed and illustrated operating instructions where required in report format.
4. Manufacturer's performance tests on operating equipment.
5. Performance reports for vibration isolation equipment.
6. Additional reports as noted in other sections.

E. Specific references to any article, device, product or material, fixture or item of equipment by name, make or catalog number will be interpreted as establishing a basis of cost and a standard of quality. All devices must be of the make and type listed by Special Agencies, such as the Underwriters' Laboratories, and where required, approved by the Commissioner.

F. Contractor must be responsible for any deviations in equipment size or configuration and access requirement, from specified products.

1.10 COORDINATION

A. Contractor must prepare preliminary shop drawings suitable for use in coordinating the work with the work of other trades. Division 23 trade must prepare and furnish background drawings with ductwork at 3/8" = 1'-0" scale for all trades to indicate piping, cable tray and conduit in relation to all structural elements of the construction, including floor elevations; steel locations, size, and elevations; partitions locations; door locations and direction of swing; and all other information required to assure coordination of the electrical, sheetmetal and piping trades and fire protection in relation to the Architectural function of the project. Coordination meetings must be held under the supervision of the Commissioner. Each trade must have proper representation at all coordination meetings for the purpose of detailing, on the drawings mentioned above, the exact location and routing of their work. After the conclusion of the coordination at the working meetings, each trade must sign the coordinated drawing original, copies of which will be distributed by the Commissioner. Final shop drawings of all trades must be in accordance with the coordinated drawing, after which final shop drawings will be submitted for final approval.

B. If the trade contractor installs work so as to cause interference with work of other trades, the Contractor must make necessary changes in work to correct the condition without additional cost to the City of New York

C. Dimensional layout plans of equipment rooms must be made showing all bases, pads and inertia blocks required for electrical equipment. Include dimensions of bases, bolt layouts, details, etc.

D. Contractor must furnish all necessary templates, patterns, etc., for installing work and for purpose of making adjoining work conform, furnish setting plans and shop details to other trades as required.

1.11 ACOUSTICAL PERFORMANCE OF EQUIPMENT AND SYSTEMS

A. All work must be designed to operate, and must operate, under all conditions of load, without any objectionable sound or vibration. Sound or vibration noticeable outside of the room in which installed, or annoyingly noticeable inside its own room, will be considered objectionable. Sound or vibration conditions considered objectionable and caused by failure to follow the Contract Documents or manufacturer's installation instructions must be corrected in an approved manner by the Contractor at no expense to the City of New York.

1.12 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Instructions and Demonstration for City of New York's Personnel:
   1. After all equipment is functioning properly, each system is to be automatically operated for ten (10) working shifts, and not to be adjusted during this period. Any adjustments will void the test and start the time period all over again.
   2. During this period, instruct the City of New York's personnel in the use, operation and maintenance of all equipment of each system. Lesson will include lecture-type instruction given in a non-machine room environment. During the lesson, normal operation of the system installed and operating will be explained, along with troubleshooting procedures. This will be followed by a field inspection and demonstration of equipment.
   3. The above instruction is exclusive of that required of specified equipment manufacturers. If more stringent or longer instruction is indicated for specific equipment or systems, these requirements will supersede the above requirements.

B. Operating and Maintenance Data:
   1. Provide four (4) complete sets of manufacturer's catalogues, instructions, maintenance and repair information and parts lists for operating equipment and devices.
      a. Include coordination curves for overcurrent protective devices (fuses, circuit breakers and protective relays), factory furnished wiring diagrams and control diagrams.
      b. Submit seven sets of instructions for distribution.
   2. Data for the equipment actually installed is to be submitted.
   3. The data is to be carefully checked for accuracy by comparison with the installed equipment nameplates.
   4. Provide a recommended list of spare parts for equipment and list of special, non-standard tools to service equipment.
   5. Index and assemble the instructions in durable loose-leaf binders.
   6. The completed binders are to be available at the time the equipment installation begins.
   7. In addition, follow all requirements of DDC General Conditions.

1.13 RECORD DRAWINGS

A. Provide and maintain a currently up-to-date record set of reproducible prints showing all changes, additions or omissions made during construction. Contractor must produce the Record Drawings.

B. Deliver four (4) sets of all as-built drawings and one (1) set of AutoCAD electronic files of the record drawings to the City of New York's before submitting requisition for final payment.

C. Shop Drawings must be cross-referenced on the Record Drawings for this requirement where applicable.

D. Submit AutoCAD, or other as required by Commissioner, compatible as-built drawing files.

1.14 WARRANTY

A. Warranty time limits for equipment exceeding those indicated in DDC General Conditions are specified in individual Division 26 sections.

B. Follow all requirements of DDC General Conditions for Close-out Procedures, Operation and Maintenance Data and Project Record Documents.

PART 2 - PRODUCTS

2.1 IDENTIFICATION

A. Refer to Section 26 05 53 for requirements.

2.2 ACCESS DOORS

A. General:
   1. Steel, flush four-sided frame and door assembly, chemically cleaned after fabrication and painted with rust inhibitive primer.
   2. Provide hardware and locking devices.

3. Provide access doors required for access to electrical work through finished wall construction and non-removable ceiling construction.
4. Deliver doors and location information to appropriate trade for installation.
5. Security Areas must be provided with security access doors.

B. Furnish for installation by the appropriate trade, flush type access door or panel no smaller than 18" x 18" and no larger than 30" x 30" for all junction or pull boxes located in chases, walls, non-accessible hung ceilings or floors. Finish must be prime coat, except floor panels which must be polished brass or chrome plate. Doors and trim 14-gauge steel, frame 16-gauge steel, with flush concealed and standard flush locks, screwdriver operated cams.
1. All panels and their exact location subject to approval of the Commissioner.
2. Where space conditions prevent door swinging open, provide removable door on lift-up hinges. This will only be accepted on a case-by-case basis. This condition must be submitted to the Commissioner for approval prior to installation.
3. Furnish a complete list locating all access doors required in finished walls, ceilings, partitions, shafts and other inaccessible locations.

2.3 PAINTING

A. All conduit, outlet boxes, pull boxes, splice boxes, supports and miscellaneous electrical equipment within all Mechanical and Electrical equipment rooms must be painted (prime and finish) as specified herein.

B. All exposed equipment, enclosures, conduits, boxes and supports, except factory finished equipment, must be painted. All un-galvanized surfaces must be painted with zinc chromate or approved equal primer. Galvanized steel surfaces must be prime coated with a dry film thickness of 0.50 mils with one-coat of PPG ACRI-PRO 100 primer (PP335), Benjamin Moore, Valspar or approved equal.

C. Unless otherwise specified on the drawings, the Contractor performing the work specified under Division 26 must provide finish painting of all prime painted electrical equipment described above.

D. All exposed equipment, enclosures, conduits, boxes and supports, except factory finished equipment, must be finish painted with two coats of finish paint. Finish paint must be compatible with the applied primer. Finish painting must be performed as specified under the requirements of Division 09. The color of the finish paint must be as determined by the Commissioner from the paint manufacturer's standard colors.

E. All damaged factory painted surfaces must be repaired to match original surface. If, in opinion of the Commissioner, such repairs are unsatisfactory, item in question must be completely refinished or replaced with new.

2.4 CLEANING AND ADJUSTING

A. Notification:
1. Inform the Commissioner of all cleaning schedules one week prior to starting.
2. Notify the Commissioner again, 48-hours prior to each event. If the Commissioner does not attend the procedures, notify in writing, the specific task performed 24-hours after each event.
3. Damage to the building and equipment resulting from tests must be repaired at no additional cost to the City of New York.

4. Tests claimed to have been performed without following above procedures will be deemed as not performed.

B. Cleaning:
1. Clean out all debris and dirt from the interior of all switchboards, panelboards, transformers and switches. Blow out transformers with dry nitrogen; pressure must not exceed 15 psi. Use Vacuum cleaner with bag and cartridge filters to remove dirt and debris from the interior of switchboards, panelboards and switches. After cleaning, the systems must be tested by an independent organization.
2. Clean all materials and equipment; leave in condition ready to operate and ready to receive succeeding finishes where required.
3. Clean the operating equipment and systems to be dust free inside and out.

C. Permanent Equipment Operating During Construction:
1. Use only in same service as the permanent applications.
2. Expendable media, including lamps used for temporary operation and similar materials are to be replaced just prior to acceptance.

D. Retouch or repaint equipment furnished with factory finish as required to provide same appearance as new.

E. Tools:
1. Provide one set of specialized or non-standard maintenance tools and devices required for servicing the installed equipment.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

A. Temporary Protection:
1. Provide and maintain protection for the work whether completed or in progress.
2. Provide suitable coverings and enclosures.

B. Scaffolding, Rigging and Hoisting:
1. Provide all scaffolding, rigging and hoisting services necessary for erection, and/or delivery into the premises, of any equipment and apparatus furnished. Remove from the premises when no longer required.

C. Waterproofing:
1. Where any work pierces waterproofing, including waterproof concrete, the method of installation must be as approved by the Commissioner before work is done. The Contractor must provide all necessary sleeves, caulking and flashing required to make openings absolutely watertight.

3.3 EQUIPMENT BASES, PLATFORMS AND SUPPORTS

A. Provide supporting platforms, steel supports, anchor bolts, inserts, etc., for all equipment and apparatus requiring access for service and maintenance.

B. Obtain prior approval for installation method of structural steel required to frame into building structural members for the proper support of equipment, conduit, etc. Welding will be permitted only when approved by the Commissioner.

C. Submit shop drawings of supports for approval to the Commissioner before fabricating or constructing.

D. Provide leveling channels, anchor bolts, complete with nuts and washers, for all apparatus and equipment secured to concrete pads and further supply exact information and dimensions for the location of these leveling channels, anchor bolts, inserts, concrete bases and pads.

E. Where supports are on concrete construction, take care not to weaken concrete or penetrate waterproofing.

3.4 ACCESSIBILITY

A. The installation of electrical equipment, including panelboards, disconnect switches, motor starters, etc., must be in accordance with the requirements of Article 110 of the New York City Electrical Code relative to working space around equipment. Equipment which is installed and does not have the working space required by the NYCEC, must be relocated by the Contractor at no additional cost to the City of New York.

3.5 MODIFICATIONS TO EXISTING WORK

A. Contractor must perform all work as shown or as specified, within the existing site and structures as part of this Contract without detriment to the existing systems or equipment to be kept in operation or maintained in their places.

B. As-Built drawings are not available on the existing installations. Any drawings that may be available to the Contractor are for information only. All field criteria must be field verified by the Contractor.

C. All cutting must be done only by mechanics skilled in the particular trade which is affected. No cutting will be done without proper protections against damage, dirt and dust resulting therefrom or without proper safeguards to workmen, the public, and occupants of buildings.

D. Before cutting is started in any location, Contractor must carefully investigate conditions influencing human and structural safety. Existing piping, wiring and items concealed in walls and slabs, wherever these walls and slabs are removed, must be properly relocated, rerouted or removed as the case may require.

E. General Construction trades must perform all finish masonry, repairing, restoring and finishing of all cut openings and closing up of existing openings.

F. Where circumstances necessitate the temporary shutdown of any facilities or otherwise interfere with access to building, the Commissioner must be given notice of such shutdowns a minimum of 5 business days in advance of the proposed shutdown. All shutdowns must be approved in writing by the Commissioner.

G. In all areas where interface, relocation or alternation work is to be done, Contractor must disconnect and remove from the premises all existing conduits, wire, panelboards, switchboards, etc., that will not be required to remain in service after the alterations are completed. All such equipment (except as requested as salvage by the Commissioner) will become the property of the Contractor, and must remove same from the premises immediately upon disconnection.

H. Move or relocate any existing electrical equipment, conduits and conductors which may temporarily interfere with the construction, (to a temporary location) if the existing equipment is to be kept in operation during construction. Also install temporary conduits, conductors and panelboards that might be required (during demolition or excavation and during the construction) in order to maintain services to the existing systems.

I. Coordinate the work with the General Construction trades and provide necessary dimensions for all openings.

J. Upon completion, remove all temporary conduits, conductors and panelboards, etc., and leave all areas clean and free from material and debris resulting from work performed under this Section. Provide rough patching in areas shown.

3.6 USE OF EQUIPMENT

A. The use of any equipment, or any part thereof, for purposes other than testing even with the Commissioner's consent, will not be construed to be an acceptance of the work on the part of the Commissioner, nor will it be construed to obligate the Commissioner any way to accept improper work or defective materials.

B. Use of permanent equipment for temporary services must be approved in writing by the Commissioner.

3.7 CODES, RULES, PERMITS AND FEES

A. The Contractor must give all necessary notices, obtain all permits and filings including, but not limited to, New York City Department of Buildings, New York State DEC, New York City and State Building Code requirements, and pay all government sales taxes, fees, and other costs, in connection with the work. The Contractor must file all necessary plans, prepare all documents and obtain all necessary approvals; obtain all required certificates of inspection for the work and deliver same to the Commissioner before request for acceptance and final payment for the work.

B. The complete design and construction must conform to the requirements of the NYCBC, NYCEC, NYCFC and any other local or state code which may govern.

3.8 FINAL REVIEW

A. Contractor must arrange and schedule final review of work and must notify the Commissioner in writing that the Contractor has thoroughly checked the work and, in the opinion of the Contractor, is ready for final review.

B. During the entire period scheduled for these reviews, the Contractor and representatives of each manufacturer of equipment involved must be present. All of these organizations must have sufficient and competent personnel present so that adjustments can be made to all systems without delay.

3.9 ACCEPTANCE

A. The operation or the temporary use of the equipment and the mechanical and electrical installation, by the Commissioner does not constitute an acceptance of the work. The final acceptance is to be made after the Contractor has adjusted the equipment, demonstrated that it fulfills the requirements of the Contract Documents, and has furnished all the required Certificates.

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 Wire and Cable.
2. Metal Clad Cable (Type MC).
3. Wiring Connectors and Connections.

B. Related Sections:
1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
2. Section 26 05 53 - Identification for Electrical Systems.

1.3 REFERENCES

A. International Electrical Testing Association (NETA):
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

B. National Fire Protection Association (NFPA):
1. NFPA 70 - National Electrical Code.
2. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

C. Underwriter's Laboratories (UL):
1. UL 83 – Thermoplastic-Insulated Wire and Cables.
2. UL 486A & 486B – Wire Connectors.
3. UL 486C – Splicing Wire Connectors.
4. UL 486D – Insulated Wire Connector Systems for Underground Use or in Damp or Wet Locations.
5. UL 486E – Standard for Safety for Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors.
6. UL 510 – Standard for Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape.
7. UL 1569 – Standard for Metal-Clad Cables.
8. UL 1581 – Reference Standard for Electrical Wires, Cables and Flexible Cords.

1.4 SYSTEM DESCRIPTION

A. Product Requirements: Provide products as follows:

1. Solid conductor for feeders and branch circuits 10 AWG and smaller.
2. Stranded conductors for control circuits.
3. Conductor not smaller than 12 AWG for power and lighting circuits.
4. Conductor not smaller than 14 AWG for control circuits.
5. Use No. 10 AWG conductors for 20 amperes, 120 volt branch circuits longer than 75 feet. Use No. 8 AWG conductors for 20 amperes, 120 volt branch circuits longer than 200 feet.

B. Wiring Methods: Provide the following wiring methods:
1. Concealed Dry Interior Locations: Use only building wire in raceway.
2. Exposed Dry Interior Locations: Use only building wire in raceway.
3. Above Accessible Ceilings: Use only building wire in raceway.
4. Wet or Damp Interior Locations: Use only building wire in raceway.
5. Exterior Locations: Use only building wire, Type USE-2 or XHHW insulation in raceway.
6. Underground Locations: Use only building wire, Type USE-2 or XHHW insulation in raceway.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data:
1. Submit for wiring connectors, including insulating materials.
2. Submit for tapes, including arc-proofing tapes.
3. Submit for cable ties.

C. Test Reports: Indicate procedures and values obtained.

D. Test Reports: Submit Calibration reports for torque drivers and torque wrenches used for electrical connections. Torque drivers and wrenches must be lab calibrated prior to use on the project and every three months thereafter.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of components and circuits.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

1.8 FIELD MEASUREMENTS

A. Verify field measurements are as indicated on Drawings.

1.9 COORDINATION

A. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.

1.10 WARRANTY

A. Furnish five-year manufacturer warranty for building wire, metal clad cable, wiring connectors, conductor pulling lubricants, tape, arc/fireproofing tape, cable support and cable ties.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Colonial Wire and Cable Co.
2. Diamond Wire and Cable Co.
3. Essex Group, Inc.
4. General Cable Co.
5. Southwire, Inc.
6. American Insulated Wire, Inc.
7. AFC Cable Systems
8. Or approved equal

B. Product Description: Single conductor insulated wire.

C. Conductor: Copper. Solid for No. 10 AWG and smaller; stranded (Class B) for No. 8 AWG and larger.

D. Insulation Ratings: 600 volts; 90 degrees C.

E. Insulation Types:
1. Type THHN/THWN or XHHW insulation for feeders and branch circuits No. 6 AWG and larger.
2. Type THHN/THWN for feeders and branch circuits No. 8 AWG and smaller.
3. Type TFFN/TFN/AMW insulation for dimmer control wiring, No. 16 or No. 18 AWG conductors. TFFN conductors must be stranded.

F. For conductor sizes No. 6 AWG and smaller, conductor insulation must be color coded as indicated in the table under Article 3.8.

2.2 METAL CLAD CABLE

A. Conductor: Copper, solid.

B. Insulation Voltage Rating: 600 volts, 90 degrees C.

C. Insulation Material: Type THHN/THWN or XHHW.

D. Conductor insulation must be color coded as indicated in the table under Article 3.8.

E. Armor Material: Steel.

F. Armor Design: Interlocked metal tape.

G. Fittings: Steel only. Die-cast zinc fittings must not be used.

H. Type MC cable must only be utilized for temporary power and lighting branch circuits.

2.3 WIRING CONNECTORS

A. General
1. Temperature rating of all connections and insulation materials must not be less than that of the conductors and in no case must be less than 75 degrees C.
2. Connectors with a copper rating must be copper with tin-plating.
3. Pre-molded insulators must be by the same manufacturer as the connector.

B. Hydraulic Compression Splices – Standard or long barrel butt splices:
1. FCI Burndy: YS-L or YS series.
2. Thomas & Betts: 54800 or 54500 series.
3. Ilsco: CT or CTL series.
4. Or approved equal

C. Hydraulic Compression Terminations – one-hole and two-hole, long barrel lugs:
1. FCI Burndy: YA, YAZ or YA-2N series.
2. Thomas & Betts: 54100, 54900 or 54800 series.
3. Ilsco: CRA, CRL or CRL2 series.
4. Or approved equal

D. Hydraulic Compression Taps ‘H’ shaped copper crimp tap:
1. FCI Burndy: YH or YSH series.
2. Thomas & Betts: CHT series.
3. Blackburn
4. Or approved equal

E. Lugs, Bolt Type:
1. FCI Burndy, Type KA-U
2. Ilsco Type TA
3. Thomas & Betts
4. Or approved equal

F. Heat Shrink Tubing:
1. FCI Burndy, Type HS-H-PF
2. Ilsco Type Heavy Wall
3. Tyco Electronics/Raychem Type WCSM
4. Thomas & Betts Type HSFR
5. Or approved equal

G. Spring Wire Connectors:
1. Buchanan
2. Ideal
3. King Industries
4. NSI Industries
5. Thomas & Betts
6. 3M
7. Or approved equal

H. Crimp Type Connectors (power and control wiring, No 10 AWG and smaller):
1. FCI Burndy
2. Buchanan
3. Ilsco Thomas & Betts
4. Or approved equal

2.4 CONDUCTOR PULLING LUBRICANTS

A. Description: Water soluble, polymer-based, non-toxic and non-sensitizing wire lubricant with volatile solids less than 6%. The lubricant must have no flash point in gel state and must leave a non-flammable residue when dry. Lubricant must be approved by the conductor manufacturer as being suitable for use with their insulation.

B. Appearance: Thick gel material, suitable for application with electrically operated pumping equipment.

C. Useful temperature range: 20 - 100 degrees F.

D. Lubricant must be equal to the following:
1. American Polywater Corporation; Polywater Clear, Polywater J.
2. Ideal Industries; Clear Glide or AquaGel II.
3. Clearco Products Company, WSC#60.
4. Or approved equal.

2.5 TAPE

A. Insulation tape must have a minimum of 350 volts per mil dielectric strength.
1. Vinyl Tape:
a. 3M Scotch No. 33.
b. HellermanTyton Type ET33.
c. ShurTape EV 077C
d. Or approved equal.
2. Phase Identification Tape:
a. 3M Scotch No. 35.
b. HellermanTyton Type ETST66.
c. ShurTape EV 077C
d. Or approved equal.

B. Rubber tape must be self-fusing, non-corrosive, with minimum 350 volts per mil dielectric strength, and meeting the requirements of Federal Specification HH-I-553.

1. 3M Electrical Tape 70.
2. Plymouth 20 Plysil.
3. Hellerman
4. Or approved equal

2.6 ARC/FIREPROOFING TAPE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. 3M
   2. Plymouth Rubber Company/Bishop
   3. Hellerman
   4. Or approved equal

B. The tape must consist of a flexible, unsupported intumescent elastomer. The tape must be .030 inches thick and must be capable of 100% elongation. The tape must be self-extinguishing and must not support combustion. The tape must be non-corrosive to metallic cable sheaths and compatible with synthetic cable jackets. The tape must be secured by a band consisting of two layers of glass cloth electrical tape.
   1. Arc-proofing tape: Subject to compliance with requirements, provide one of the following:
      a. 3M No. 77 with 3M Scotch No. 69 glass cloth tape
      b. Bishop No. 53 with Plymouth/Bishop No. 77 Plyglas glass cloth tape.
      c. Hellerman
      d. Or approved equal

C. All fireproofing tapes must be products of one manufacturer.

2.7 CABLE SUPPORTS

A. Cable Supports for Vertical Conduit must be as specified in Section 26 05 33 – Raceways and Boxes for Electrical Systems.

2.8 CABLE TIES

A. Cable ties must be self-locking type with a minimum width of .180 inches.

B. All cable ties must be suitable for use in air handling plenums or equipment and must be manufactured using low smoke density material and must meet UL 94V-O flammability requirement.

C. Cable ties must be as manufactured by the following:
   1. FCI Burndy
   2. Panduit
   3. Thomas & Betts
   4. Or approved equal

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify mechanical work likely to damage wire and cable has been completed.

B. Verify raceway installation is complete and supported.

3.3 PREPARATION

A. Conduits and raceways must be installed and completed prior to the installation of conductors.

B. Prior to installing cables in conduits, visually inspect conduits for damage. Thoroughly swab conduits and raceways before installing conductors. Verify that bushings are in place and properly secured to prevent damage to conductors.

3.4 APPLICATION

A. Wiring for temporary construction power (receptacles) and construction lighting must be fed with Type MC cable.

3.5 EXISTING WORK

A. Remove exposed abandoned wire and cable, including abandoned wire and cable above accessible ceiling finishes. Patch surfaces where removed cables pass through building finishes.

B. Disconnect abandoned circuits and remove circuit wire and cable. Remove abandoned boxes when wire and cable servicing boxes is abandoned and removed. Install blank cover for abandoned boxes not removed.

C. Provide access to existing wiring connections remaining active and requiring access. Modify installation or install access panel.

D. Extend existing circuits using materials and methods compatible with existing electrical installations, or as specified.

E. Clean and repair existing wire and cable remaining.

3.6 GENERAL WIRING REQUIREMENTS

A. Wiring must be provided complete from point of service connection to all receptacles, lighting fixtures, power outlets, outlets for future extensions and other devices as shown. Slack wire must be provided for all future connections. Unless otherwise specified, branch circuit conductors must be No. 12 AWG or larger. In outlet boxes for future installations, ends of wires must be taped and blank covers installed. Type of blank covers in finished areas are to be coordinated with the Commissioner.

B. Cables must not be bent either permanently or temporarily during installation to radii less than that recommended by the manufacturer.

C. Conductors not larger than No. 10 AWG located in branch circuit panelboards, signal cabinets and switchboard must be bundled. Conductors larger than No. 10 AWG located in switchboard, distribution panels and pullboxes must be bundled in individual circuits. Bundling and cabling must be done with cable ties.

D. Use No. 10 AWG conductors for 20 amperes, 120 volt branch circuits longer than 75 feet. Use No. 8 AWG conductors for 20 amperes, 120 volt branch circuits longer than 200 feet.

E. Where homerun circuit numbers are shown, such numbers must be followed in connecting circuits to panelboards. Where a common neutral conductor is utilized, typically for system furniture connection, the phase conductors must be connected to a common trip, multi-pole circuit breaker.

F. Where conductors of different feeders are bundled by circuit in switchboards, distribution panels, pull boxes and cable support boxes, the conductor bundles must be provided with arc-proofing as specified below.

3.7 INSTALLATION

A. Route wire and cable to meet Project conditions.

B. Neatly train and lace wiring inside boxes, equipment and panelboards.

C. Identify wire and cable under provisions of Section 26 05 53. Identify each conductor with its circuit number or other designation indicated. Wire must be color coded as indicated in Article 3.7 below.

D. Special Techniques - Building Wire in Raceway:
1. Installation equipment must be provided to prevent cutting and abrasion of conduits or conductors. Ropes used for pulling of feeders must be made of polyethylene or other non-metallic material.
2. Pulling lines must be attached to conductor cables by means of either woven basket grips or pulling eyes attached directly to the conductors. Rope hitches must not be used.
3. Pull all conductors into raceway at the same time.
4. Install building wire 4 AWG and larger with pulling equipment.
5. Apply conductor pulling lubricant to conductors No. 4 AWG and larger as the conductors enter the raceway. For conductors No. 1/0 AWG and larger, the lubricant must be applied as recommended by the cable manufacturer, as the conductors enter the conduit.
6. Upon completion of conductor pulling, clean wire pulling lubricant from exposed portions of cables. If cables will not be immediately terminated, cut exposed copper conductor to insulation and seal conductor ends.
7. Install vertical conductor supports when installing conductors. Conductor supports must be installed in accordance with the manufacturer’s instructions.

E. Special Techniques - Cable:
1. Protect exposed cable from damage.
2. Use suitable cable fittings and connectors.

F. Special Techniques - Wiring Connections:
1. Perform all connection work in strict accordance with recommendations of manufacturers of the wire and connecting device, unless otherwise noted.
2. Make splices, taps and terminations to carry full ampacity of conductors with no perceptible temperature rise.
3. Clean conductor surfaces before installing lugs and connectors.
4. Apply anti-oxidation inhibitor compound containing copper to all stranded copper wire connections.
5. Install hydraulic compression connectors for terminations, splices and taps for conductor sizes No. 6 AWG and larger.

6. Utilize hydraulic tools for compression connectors in accordance with manufacturers' recommendations. Tools must be non-removable until completion of the connection and must leave an embossed mark to verify that proper die has been used.
7. Tools must provide a hexagonal or circumferential crimp to the connectors. Indentation type tools are not acceptable.
8. Splices, taps and termination lugs must be insulated with heavy wall heat shrink tubing. Tubing must overlap the conductor insulation by a minimum of 2-inches. The tubing must be applied using electric heat guns. Open flames or torches must not be used.
9. Tighten all busbar and stud connections with Belleville washers, or manufacturer standard washers, utilizing torque wrench or torque indicating washer designed for the purpose by the connector manufacturer.
10. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, No. 6 AWG and larger.
11. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, No. 8 AWG and smaller.

G. Connector Application
1. Connector applications listed must be utilized when equipment is not provided with factory installed lugs.
2. Wire to busbar for wire sizes No. 1/0 AWG and smaller; one-hole hydraulic compression lug.
3. Wire to busbar for wire sizes No. 2/0 AWG and larger; two-hole hydraulic compression lug.
4. Wire to Stud, switch or circuit breaker; one-hole mechanical lug.
5. Stranded wire, No. 8 AWG or larger splice, tap or pigtail connection; hydraulic compression connector with heavy-wall heat shrink tubing or pre-molded thermoplastic insulator by connector manufacturer with two half-lapped layers of vinyl tape.

H. Install solid conductor for feeders and branch circuits No. 10 AWG and smaller.

I. Where branch circuit conductors are terminated on terminal strips within equipment or control panel enclosures, stranded conductors may be used for branch circuits 10 AWG and smaller. When stranded conductors are used in lieu of solid conductors, install crimp-on terminals for conductor terminations. Do not place bare stranded conductors directly under terminal screws.

3.8 WIRE COLOR

A. The covering of wires and cables must have a distinctive color code for identification of individual conductors.

B. Secondary service, feeder and branch circuit conductors throughout the electrical system must be color coded as follows:

Phase	208/120 Volts	480/277 Volts
A	Black	Brown
B	Red	Orange
C	Blue	Yellow
Neutral	White	Gray or white with trace
Ground	Green	Green
Isolated Ground	Green with tracer	
Neutral of Ground fault circuit	White with tracer	

C. For conductor size No. 6 AWG and smaller, conductor insulation must be color coded as indicated in the table above.

D. For conductor sizes No. 4 and larger, conductors must be identified colored tape or heat shrink tubing at terminals, splices and boxes. Tape must be applied half-lapped, with a minimum length of 6 inches.

E. Neutral Conductors: When two or more neutrals are located in one conduit, individually identify each neutral to match the related phase conductor.

3.9 ARC/FIREPROOFING

A. Where more than one set of cables, that are protected by more than one over-current protective device, are installed in a common equipment enclosure or box and any wire is larger than No. 4 AWG, then all sets of conductors must be covered with arcproof and fireproof tape. Where necessary to facilitate taping, boxes must be oversized.

B. Tape must be applied in a single layer, one half lapped, or as recommended by the manufacturer to conform to the above requirements. The tape must be applied with the coated side next to the cable and must be held in place with a random wrap of one-half inch wide, pressure-sensitive fiberglass backed color plastic film tape. This tape must not support combustion per ASTM.

3.10 MOTOR AND CONTROL WIRING

A. Provide all wiring to and between motors, starters, disconnect switches and other related electrical equipment except where such items are factory wired.

B. Provide control wiring at 120 volts or higher for control devices wired with branch circuits serving utilization equipment, unless otherwise specified in other Division of the Specifications.

C. For control devices operating at voltages lower than 120 volts nominal, refer to the respective Sections.

3.11 FIELD QUALITY CONTROL

A. In addition to any testing specified elsewhere in these Specifications, the Contractor must perform basic testing of the work.

B. Contractor must verify the continuity of all branch circuit wiring.

C. Contractor must verify that branch circuits are properly terminated.

D. Measure the tightness of all conductor terminations using calibrated torque drivers or torque wrenches.

E. Verify the insulation integrity of all feeders using a 1,000 volt insulation resistance tester. Digital multimeters must not be used to verify insulation integrity

F. Inspect and test in accordance with NETA ATS, except Section 4 – Division of Responsibility.

G. Perform inspections and tests listed in NETA ATS, Section 7.3.2. – Cables, Low-Voltage, 600 Volt Maximum.

H. The Contractor must provide a written report of the testing and must include the following information:
   1. Name of the test technician and the technician's company.
   2. Contact information for the testing company.
   3. Date of tests, including start and stop time.
   4. Temperature and humidity (measured) conditions and general observation of the testing environment.
   5. Instruments used, including serial numbers, calibration data and documentation of calibration.
   6. Identification of circuit or equipment tested. Identification must correspond to the project drawings.
   7. Test performed and test results.

END OF SECTION 26 05 19

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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:
1. Wire.
2. Ground Bus.
3. Exothermic Weld Connections.
4. Mechanical Connectors.

B. Related Sections:
1. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.

1.3 REFERENCES

A. Institute of Electrical and Electronics Engineers (IEEE):
1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
2. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.

B. International Electrical Testing Association (NETA):
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. National Fire Protection Association (NFPA):
1. NFPA 70 - National Electrical Code.
2. NFPA 99 - Standard for Health Care Facilities.

1.4 SYSTEM DESCRIPTION

A. Grounding systems use the following elements as grounding electrodes:
1. Metal building frame.

1.5 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 25 ohms maximum.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit data on grounding connections.

1.7 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of components and grounding electrodes.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years documented experience.

1.10 DELIVERY, STORAGE AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

B. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

C. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

1.11 COORDINATION

A. Complete grounding and bonding of building reinforcing steel prior concrete placement.

1.12 WARRANTY

A. Furnish five-year manufacturer warranty for wire, ground bus, exothermic connections, hydraulic connectors and mechanical connectors.

PART 2 - PRODUCTS

2.1 WIRE

A. Material: Stranded copper.

B. Bonding Conductor: Copper conductor insulated.

2.2 GROUND BUS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Eaton/B-Line.
   2. Erico International Corporation

3. Chatsworth Products
4. Harger Lightning & Grounding
5. Or approved equal

B. General: Ground bus must be copper, 1/4" x 4” x 1’-0” mounted on insulated standoff brackets conforming to TIA-607.

C. Ground bus must be drilled for two-hole lugs utilizing 5/16” and 7/16” bolts.

2.3 EXOTHERMIC CONNECTIONS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cadweld/Erico Products, Inc.
2. Furseweld/Thomas & Betts, Inc.
3. Harger Lightning & Grounding
4. Or approved equal.

B. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

C. Connections to structural steel for telecommunications ground busses must be with exothermic welds.

2.4 HYDRAULIC CONNECTORS

A. General
1. Temperature rating of all connections and insulation materials must not be less than that of the conductors and in no case must be less than 75 degrees C.
2. Connectors with a copper rating must be copper with tin-plating.

B. Hydraulic Compression Terminations – one-hole and two-hole, long barrel lugs:
1. FCI Burndy: YA, YAZ or YA-2N series.
2. Thomas & Betts: 54100, 54900 or 54800 series.
3. Ilsco: CRA, CRL or CRL2 series.
4. Or approved equal

C. Hydraulic compression lugs must be connected to bus bars with silicon bronze bolts, flat washers and nuts. Provide spring steel concave (Belleville) washers and tighten with a calibrated torque wrench.

2.5 MECHANICAL CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. O-Z/Gedney.
2. Appleton Electric.
3. Thomas & Betts
4. Or approved equal.

B. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

C. Connectors must be mounted to the bus bar with silicon bronze bolts, washers, nuts and spring steel (Belleville) washers. Bolts must be tightened with a calibrated torque wrench.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Remove paint, rust, mill oils and surface contaminants at connection points.

3.3 EXISTING WORK

A. Modify existing grounding system to maintain continuity to accommodate renovations.

B. Extend existing grounding system using materials and methods compatible with existing electrical installation.

3.4 INSTALLATION

A. Install grounding and bonding conductors concealed from view.

B. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.

C. Permanently ground entire light and power system in accordance with NFPA 70, including distribution panels, lighting panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.

D. Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with NFPA 70. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment.

E. Grounding electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC.

F. Permanently attach equipment and grounding conductors prior to energizing equipment.

G. Telecommunication Grounding conductors: Install ground conductor from ground bus to building steel. Connect conductor to building steel with exothermic weld connection. Connect conductor to ground bus with hydraulic compression lug and silicon bronze hardware with spring steel washer.

3.5 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.

C. Perform ground resistance testing in accordance with IEEE 142.

D. Perform continuity testing in accordance with IEEE 142.

E. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

END OF SECTION 26 05 20

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SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
1. Anchors.
2. Conduit supports.
3. Formed steel channel.
4. Spring steel clips.
5. Sleeves.
6. Mechanical sleeve seals.
7. Fire stopping relating to electrical work.
8. Equipment bases and supports.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Product requirements for concrete for placement by this section.
2. Section 07 84 00 - Firestopping.

1.3 REFERENCES

A. ASTM International (ASTM):
1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

B. Factory Mutual Global (FM):
1. FM - Approval Guide: A Guide to Equipment, Materials & Services Approved By Factory Mutual Research for Property Conservation.

C. National Fire Protection Association(NFPA):
1. NFPA 70 - National Electrical Code.

D. Underwriters Laboratories Inc. (UL):
1. UL 263 - Fire Tests of Building Construction and Materials.
2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
3. UL 1479 - Fire Tests of Through-Penetration Firestops.
4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.

5. UL - Fire Resistance Directory.

E. Intertek Testing Services Warnock Hersey Listed:
1. WH - Certification Listings.

1.4 DEFINITIONS

A. Firestopping Through-Penetration Protection System: Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.5 SYSTEM DESCRIPTION

A. Firestopping Materials: Comply with requirements of Section 07 84 00.

B. Firestop interruptions to fire rated assemblies, materials and components.

1.6 PERFORMANCE REQUIREMENTS

A. Firestopping Materials: Comply with requirements of Section 07 84 00.

1.7 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.

C. Product Data:
1. Hangers and Supports: Submit manufacturers catalog data including load capacity.
2. Firestopping: Submit data on product characteristics, performance and limitation criteria.

D. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.

E. Design Data: Indicate load carrying capacity of trapeze hangers and hangers and supports. Load Calculations for spacing of supports must be submitted by a Professional Engineer licensed in the State of New York.

F. Manufacturer's Installation Instructions:
1. Hangers and Supports: Submit special procedures and assembly of components.
2. Firestopping: Submit preparation and installation instructions.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

H. Firestopping Engineering Judgments: For conditions not covered by UL listed designs, submit judgments by licensed professional engineer suitable for presentation to building department inspector for acceptance as meeting code fire protection requirements.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years documented experience.

B. Installer: Company specializing in performing work of this section.

1.10 PRE-INSTALLATION MEETINGS

A. Convene minimum one (1) week prior to commencing work of this section.

1.11 DELIVERY, STORAGE AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

B. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1.12 WARRANTY

A. Furnish five-year manufacturer warranty for Anchors, Conduit Supports, Formed Steel Channel, Sleeves, Mechanical Sleeve Seals, Firestopping.

PART 2 - PRODUCTS

2.1 ANCHORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Hilti
   2. Powers Fasteners
   3. Simpson Strong-Tie
   4. Or approved equal

B. Basis-of-Design Product: Subject to compliance with requirements, provide anchors or comparable product by one of the following:
   1. Hilti
   2. Powers Fasteners
   3. Simpson Strong-Tie
   4. Or approved equal

C. Anchors for existing concrete structure must be adhesive anchors. Adhesive anchors must be adhesive anchor systems utilizing 304 stainless steel threaded rod with a minimum tensile strength of 100 ksi and a minimum yield strength of 65 ksi. Minimum rod size must be 3/8” diameter. Nuts must be stainless steel

type 304 conforming to ASTM F594. Washers must be stainless steel type 304 conforming to ASTM A240. Contractor must space anchors to conform to the manufacturers design tables. Minimum embedment must be 3-3/8" unless otherwise permitted by the actual loads and calculations.

D. Anchors for new concrete installed as part of this project must be either adhesive anchors as indicated above or expansion anchors. Expansions anchors must be utilizing stainless steel type 304 anchors. Minimum anchor size must be 3/8" diameter.

E. Anchors for precast concrete, hollow concrete or concrete masonry units (CMU) must be adhesive anchors. Adhesive anchors must be hybrid adhesive anchors for masonry construction. Anchor system must consist of a composite mesh sleeve, a two-part adhesive and an internally threaded insert. Minimum anchor (bolt) size must be 1/4" diameter. Contractor must space anchors to conform to the manufacturers design tables.

F. Anchors for drywall, hollow masonry or concrete masonry units (CMU) for mounting single conduit straps (1" conduit or smaller) and outlet boxes must be one piece polypropylene toggle type anchors. Anchors must be used with No. 8, 10 or 12 pan head sheet metal screws.

2.2 CONDUIT SUPPORTS

A. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.

B. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.

C. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.

D. Conduit clamps - general purpose: One-hole malleable iron for surface mounted conduits.

2.3 FORMED STEEL CHANNEL

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. B-Line by Eaton
2. Gregory Industries G-Strut
3. Unistrut Corporation
4. Thomas & Betts Kindorff
5. Or approved equal

B. Product Description: ASTM A 570 GR 33 steel, 12 gage) thickness. Channel must be 1-5/8" width, hot-dipped galvanized or acrylic enamel coated for interior use, stainless steel 304 for exterior use, with or without holes. Depth of the channel must be as required by the load requirements. All fittings must be of the same material and finish as the channel.

2.4 SLEEVES

A. Sleeves for penetration through non-fire rated floors: 18 gage thick galvanized steel.

B. Sleeves for penetrations through non-fire rated foundation walls, footings, and potentially wet floors: Schedule 40 galvanized steel pipe.

C. Sleeves for penetrations through fire rated and fire resistive floors and walls: Schedule 40 galvanized steel pipe. Sleeve must be two (2) trade sized larger than the penetrating conduit or pipe.

D. Fire-stopping Insulation: Mineral wool as specified in Section 07 84 00.

2.5 MECHANICAL SLEEVE SEALS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. GPT Link-Seal
2. Modular Seal
3. MetraFlex
4. Or approved equal.

B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.6 FIRESTOPPING

A. Firestopping Materials: Comply with requirements of Section 07 84 00.

2.7 FIRESTOPPING ACCESSORIES

A. Installation Accessories: Comply with requirements of Section 07 84 00.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify openings are ready to receive sleeves.

B. Verify openings are ready to receive firestopping.

3.3 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.

B. Remove incompatible materials affecting bond.

C. Install backing or damming materials to as require by the system manufacturer.

D. Obtain permission from the Commissioner before drilling structural members.

3.4 INSTALLATION - HANGERS AND SUPPORTS

A. Anchors and Fasteners:
   1. Concrete Structural Elements: Provide expansion anchors (for new concrete only) or adhesive anchors (existing concrete).
   2. Steel Structural Elements: Provide beam clamps or welded fasteners.
   3. Concrete Surfaces: Provide expansion anchors (for new concrete only) or Adhesive anchors (for existing concrete).
   4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide polyethylene toggle anchors.
   5. Solid Masonry Walls: Provide expansion anchors or adhesive anchors.
   6. Sheet Metal: Provide sheet metal screws.
   7. Wood Elements: Provide wood or sheet metal screws.

B. Install conduit and raceway support and spacing in accordance with NEC.

C. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.

D. Install multiple conduit runs on common hangers.

E. Where adhesive anchors are utilized in terra cotta ceilings or walls, Contractor must retain the services of the adhesive system manufacturer to perform pull tests of the installed anchors. Pull tests must be a minimum of 10 percent of the anchors, but not less than two anchors. The Commissioner may request additional tests where test results are less than 3 times the anticipated load or where spacing may impose substantial loads on the existing structure due to the loads being supported.

F. Supports:
   1. Fabricate supports from formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
   2. Install surface mounted cabinets and panelboards with minimum of four anchors to steel channels.
   3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.
   4. Support vertical conduit at every floor.

3.5 INSTALLATION - FIRESTOPPING

A. Firestopping Materials: Refer to Section 07 84 00.

3.6 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum 4-inches thick and extending 6 inches beyond supported equipment. Refer to Section 03 30 00 - Cast-In-Place Concrete.

B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment. Equipment anchoring must be in accordance with New York City Building Code requirements for seismic restraint.

C. Construct supports of formed steel channel. Brace and fasten with flanges bolted to structure.

3.7 INSTALLATION - SLEEVES

A. Exterior watertight entries: Seal with adjustable interlocking rubber links.

B. Conduit penetrations not required to be watertight: Sleeve and fill with fire stopping materials.

C. Extend sleeves through floors 3-inches above finished floor level. Caulk sleeves.

D. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and seal airtight with fire stopping caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

3.8 FIELD QUALITY CONTROL

A. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.9 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.10 PROTECTION OF FINISHED WORK

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION 26 05 29

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SECTION 26 05 33 - RACEWAY 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. Conduit and tubing.
2. Surface raceways.
3. Wireways.
4. Outlet boxes.
5. Pull and junction boxes.

B. Related Sections:
1. Section 07 84 00 - Firestopping.
2. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
3. Section 26 05 29 - Hangers and Supports for Electrical Systems.
4. Section 26 05 53 - Identification for Electrical Systems.
5. Section 26 27 26 - Wiring Devices.

1.3 REFERENCES

A. American National Standards Institute (ANSI):
1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
3. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).
4. ANSI C80.6 - Intermediate Metal Conduit, Zinc Coated.

B. National Electrical Manufacturers Association (NEMA):
1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
4. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
5. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
6. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

C. National Fire Protection Association (NFPA):
1. NFPA 70 –The National Electrical Code.

D. Underwriters Laboratories, Inc. (UL):
   1. UL 1 – Standard for Flexible Metal Conduit.
   2. UL 5 – Standard for Surface Metal Raceways and Fittings.
   3. UL 6 – Standard for Electrical Rigid Metal Conduit.
   4. UL 6A – Standard for Electrical Rigid Metal Conduit – Aluminum and Stainless Steel.
   5. UL 360 – Standard for Liquid-Tight Flexible Steel Conduit.
   6. UL 467 – Standard for Grounding and Bonding Equipment.
   7. UL 514B – Standard for Fittings for Cable and Conduit.
   8. UL 651 – Standard for Schedule 40 and 80 Rigid PVC Conduit.
   9. UL 797 – Standard for Electrical Metallic Tubing – Steel.
   10. UL 1242 – Standard for Electrical Intermediate Metal Conduit – Steel.

1.4 SYSTEM DESCRIPTION

A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.

B. Wet and Damp Locations: Provide rigid galvanized steel conduit. Provide cast metal outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.

C. Feeders, Concealed Dry Locations: Provide rigid galvanized steel. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

D. Branch circuits, Concealed Dry Locations: Provide electrical metallic tubing (EMT) with steel compression fittings. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

E. Exposed Locations subject to physical damage: Provide rigid galvanized steel. Provide sheet-metal boxes. Provide hinged enclosure for large pull boxes.

F. Connections to Vibrating Equipment: Flexible metal conduit. In damp or wet location use Liquid-tight flexible metal conduit.

1.5 DESIGN REQUIREMENTS

A. Minimum Raceway Size: 3/4- inch unless otherwise specified.

B. All conduit must be concealed within wall construction or above ceilings, unless otherwise indicated on the Drawings.

1.6 DEFINITIONS

A. RGS: Rigid Galvanized Steel.

B. GRC: Same as RGS.

C. EMT: Electrical Metallic Tubing.

D. FMC: Flexible Metal Conduit.

E. LFMC: Liquid-tight Flexible Metal Conduit.

F. Concealed Dry Locations: Dry locations above hung ceilings and in interior walls and partitions.

G. Exposed Dry Locations, subject to physical damage:
1. Loading Docks.
2. Corridors used for traffic of mechanized carts, forklifts, pallet-handling units, dumpsters.
3. Mechanical Rooms.
4. Telecommunication Rooms.

H. Damp and Wet Locations:
1. Exposed or outdoor loading docks.
2. Outdoor locations, including roofs.
3. Indoor areas subject to hose down washing.

1.7 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit for the following:
1. Flexible metal conduit.
2. Liquidtight flexible metal conduit.
3. Raceway fittings.
4. Conduit bodies and fittings.
5. Surface raceway.
6. Wireway.
7. Pull and junction boxes.

C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use, stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.8 CLOSEOUT SUBMITTALS

A. Project Record Documents:
1. Record actual routing of conduits larger than 2 inches.
2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.9 DELIVERY, STORAGE AND HANDLING

A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

1.10 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.11 COORDINATION

A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

1.12 WARRANTY

A. Furnish five-year manufacturer warranty for metal conduit, metal conduit fittings, liquidtight flexible metal conduit, electrical metallic tubing (EMT), surface metal raceway, wireway and outlet boxes.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

A. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
   1. Metallic Conduit:
      a. Allied Tube and Conduit Corporation
      b. Triangle Wire and Cable Co.
      c. Republic Conduit
      d. Wheatland Conduit
      e. Or approved equal
   2. Metallic Conduit Fittings:
      a. Bridgeport Fittings
      b. Cooper/Crouse Hinds
      c. Thomas & Betts Corporation
      d. O-Z/Gedney
      e. Appleton Electrical Products
      f. Or approved equal

B. Rigid Steel Conduit: ANSI C80.1. Heavy wall steel conduit, threaded on each end and hot dipped galvanized.

C. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit. Die cast zinc fittings must not be used.

2.2 METAL CONDUIT FITTINGS

A. Fitting and couplings for galvanized rigid steel and galvanized intermediate metal conduit must be manufactured from galvanized steel, galvanized ductile iron or galvanized malleable iron. All conduit fittings must be threaded.

B. Die-cast zinc-alloy fittings of any type must not be used on any type of conduit.

C. Bushings for rigid and intermediate metal conduit 1-1/4 inch and larger must be of the threaded grounding insulated-throat type. The bushing must be manufactured of malleable iron or aluminum, with an integral ground lug and stainless steel grounding screw. Bushings must meet the requirements of UL 467 and UL 514B. The insulating throat must be of thermo-setting plastic, nylon or fiber material, molded into the

metallic body of the fitting. Conduit bushings made entirely of non-metallic material must not be used. The grounding means may be either pressure type wire terminals or copper grounding lugs.

1. Thomas & Betts Blackjack (BG) Series.
2. O-Z/Gedney Type B.
3. Eaton 1031 through 1040.
4. Or approval equal

D. Elbows, bends and nipples for Rigid Steel and Intermediate Metal conduits must be threaded, of same grade of material and hot-dip galvanized in same manner as straight lengths.

E. Conduit unions must be two-piece (Erickson couplings) or three-piece threaded couplings and must be used to join two conduits coming together from opposite directions when standard threaded couplings cannot be used. Only steel/malleable iron fittings must be used with steel conduits.

1. Thomas & Betts 674 series
2. O-Z/Gedney Type 4.
3. Eaton/Crouse-Hinds 191 to 199.
4. Or approval equal.

F. Conduit bodies (LB, T, C, etc.) must be manufactured from gray iron, malleable iron or die-cast copper-free aluminum. Iron fittings must be zinc plated. Covers must be steel with zinc plating and a neoprene gasket. All conduit bodies must have threaded conduit inlets.

1. Thomas & Betts
2. O-Z/Gedney.
3. Eaton/Crouse-Hinds
4. Or approval equal

G. Conductor supports must be wedging plug type, consisting of a malleable or ductile iron body, which threads onto the end of a conduit, and an impregnated wood plug, drilled for the installed conductors. Wood plugs must be factory drilled for the conductors installed.

1. O-Z/Gedney Type S.
2. Producto Electric Corp.
3. Thomas & Betts
4. Or approval equal

H. Conduit fittings for grounding conductors must be terminated with a die-cast bronze fitting and a brass screw. The fitting must be threaded onto the end of the conduit, with the conductor routed through an opening with the set-screw. The set screw must be tightened against the conductor to provide bonding of the conduit to the ground conductor. Ground conductor fittings will be by:

1. O-Z/Gedney GH-B series.
2. Thomas & Betts Type CH Bronze Conduit Hubs
3. Garvin – A Southwire Company
4. Or approved equal

I. Fittings for flexible metal conduit must be in accordance with UL 514B, made of steel or malleable iron and having an insulated throat. Fittings will be by:

1. Thomas & Betts 3110 Series
2. Appleton No. 7483I to 7490I
3. Eaton/Crouse-Hinds No. 709 to 722

4. Or approved equal

J. Expansion Fittings will be as follows:
   1. Deflection and Expansion Fitting:
      a. Eaton/Crouse-Hinds type XD
      b. O-Z/Gedney type DX
      c. Thomas & Betts XD
      d. Or approved equal
   2. Expansion Fitting:
      a. O-Z/Gedney type AX
      b. Eaton/Crouse-Hinds XJG
      c. Thomas & Betts XJG
      d. Or approved equal
   3. Expansion fittings must be provided with an external bonding jumper, consisting of steel 'U' bolts, a malleable or ductile iron clamp, and a tinned copper braid conductor.
      a. O-Z/Gedney Type BJ
      b. Eaton/Crouse-Hinds BJ
      c. Thomas & Betts XD
      d. Or approved equal

2.3 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. AFC Cable Systems
   2. Alflex corporations
   3. Electri-Flex Co.
   4. Or approved equal

B. Product Description: Interlocked steel construction with PVC jacket. Product must be UL Listed.

C. Fittings: NEMA FB 1. Fittings must be zinc-coated malleable iron or steel. Die-cast zinc fittings are not acceptable.

2.4 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Allied Tube and Conduit Corporation
   2. Triangle Wire and Cable Co.
   3. Republic Conduit
   4. Wheatland Conduit
   5. Or approved equal

B. Product Description: ANSI C80.3; galvanized tubing.

C. Fittings and Conduit Bodies: NEMA FB 1; zinc coated steel compression type. Die-cast zinc fittings must not be used.

2.5 SURFACE METAL RACEWAY

A. Basis-of-Design: Subject to compliance with requirements, provide surface metal raceway by Legrand/The Wiremold Company G-4000 series or comparable product by one of the following:
   1. Hubbell
   2. Panduit Corporation
   3. Mono-Systems
   4. Or approved Equal

B. Product Description: Sheet metal channel with fitted cover, suitable for use as surface metal raceway. Raceway must be provided with an internal metal divided to separate low-voltage cabling from line voltage conductors.

C. Size: 4.75 x 1.75 inch.

D. Finish: Gray enamel.

E. Fittings, closures and device mountings: Furnish manufacturer's standard accessories; match finish on raceway.

2.6 WIREWAY

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Hammond Manufacturing
   2. Hoffman
   3. Schneider Electric/Square D
   4. The Wiremold Company
   5. Or approved equal

B. Product Description: General purpose type wireway.

C. Knockouts: None.

D. Size: 6 x 6 inch length as indicated on Drawings.

E. Cover: Screw cover.

F. Connector: Slip-in.

G. Finish: Rust inhibiting primer coating with gray enamel finish.

2.7 OUTLET BOXES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Hubbell/Raco
   2. Thomas & Betts/Steel City
   3. Appleton
   4. Or approved equal

B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
   1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required. Minimum box size must be 4" Octagonal, 1-1/2" deep.
   2. Minimum box size must be 4" x 4" x 1-1/2" deep.
   3. Provide Extension rings as required to accommodate wall thickness.

C. Cast Boxes: NEMA FB 1, Type FD, cast iron alloy with threaded hubs, zinc coated. Furnish gasketed cover, UL Listed as "in-use" for receptacles.

D. Wall Plates for Finished Areas: As specified in Section 26 27 26.

E. Wall Plates for Unfinished Areas: Furnish stainless steel cover. Where boxes are in wet or damp areas, furnish gasketed cover.

2.8 PULL AND JUNCTION BOXES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Hammond Manufacturing
   2. Hoffman
   3. Hubbell-Wiegmann Enclosures
   4. Or approved equal.

B. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

C. Hinged Enclosures.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.3 INSTALLATION

A. Install conduits parallel and/or perpendicular to building column lines. Coordinate location of conduits and pull, spliced and outlet boxes with work of other trades to maintain access to boxes.

B. Ground and bond raceway and boxes in accordance with Section 26 05 26.

C. Fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.

D. Identify raceway and boxes in accordance with Section 26 05 53.

E. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.4 INSTALLATION - RACEWAY

A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

B. Arrange raceway supports to prevent misalignment during wiring installation.

C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

D. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 26 05 29.

E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports.

F. Do not attach raceway to ceiling support wires or other piping systems.

G. Construct wireway supports from steel channel specified in Section 26 05 29.

H. Route exposed raceway parallel and perpendicular to walls.

I. Route raceway installed above accessible ceilings parallel and perpendicular to walls.

J. Maintain clearance between raceway and piping for maintenance purposes.

K. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.

L. Cut conduit square using saw or pipe cutter; de-burr cut ends.

M. Bring conduit to shoulder of fittings; fasten securely.

N. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, such as around beams. Utilize hydraulic one-shot bender to fabricate bends in metal conduit larger than 2 inch size.

O. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.

P. Install fittings to accommodate expansion and deflection where raceway crosses expansion joints.

Q. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

R. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

S. Surface Raceway: Install flat-head screws, clips, and straps to fasten raceway channel to surfaces; mount plumb and level. Install insulating bushings and inserts at connections to outlets and corner fittings.

T. Close ends and unused openings in wireway.

3.5 INSTALLATION - BOXES

A. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings.

B. Adjust box location up to 10-feet prior to rough-in to accommodate intended purpose.

C. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.

D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

E. In non-accessible ceiling areas: Install outlet and junction boxes no more than 6-inches from ceiling access panel or from removable recessed luminaire.

F. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

G. Do not install flush mounting box back-to-back in walls; install with minimum 6-inches separation. Install with minimum 24 inches separation in acoustic rated walls.

H. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

I. Install stamped steel bridges to fasten flush mounting outlet box between studs.

J. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

K. Install adjustable steel channel fasteners for hung ceiling outlet box.

L. Do not fasten boxes to ceiling support wires or other piping systems.

M. Support boxes independently of conduit.

N. Install gang box where more than one device is mounted together. Do not use sectional box.

O. Install gang box with plaster ring for single device outlets.

3.6 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods in accordance with Section 07 84 00.

B. Locate outlet boxes to allow luminaires positioned as indicated on reflected ceiling plan.

C. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.7 ADJUSTING

A. Adjust flush-mounting outlets to make front flush with finished wall material.

B. Install knockout closures in unused openings in boxes.

3.8 CLEANING

A. Clean interior of boxes to remove dust, debris, and other material.

B. Clean exposed surfaces and restore finish.

END OF SECTION 26 05 33

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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. Nameplates.
2. Labels.
3. Wire markers.
4. Conduit markers.

B. Related Sections:
1. Section 09 90 00 - Painting: Execution requirements for painting specified by this section.
2. Section 26 05 00 - General Electrical Requirements.
3. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
4. Section 26 24 16 - Panelboards.
5. Section 26 28 19 - Enclosed Switches.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data:
1. Submit manufacturer’s catalog literature for each product required.
2. Submit shop drawing of proposed equipment labeling. Shop drawings must show full size nameplates.
3. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location and function.

C. Samples:
1. Submit sample laminated plate with three lines of engraved legend and beveled edge showing color of engraving and holes for fastening.
2. Submit two (2) nameplates, actual size.
3. Submit two (2) labels, actual size.
4. Submit two (2) samples of each type of identification products applicable to project.

D. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years documented experience.

1.7 DELIVERY, STORAGE AND HANDLING

A. Accept identification products on site in original containers. Inspect for damage.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

C. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Install labels only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 - PRODUCTS

2.1 NAMEPLATES

A. Laminate and engraved plastic nameplates must consist of a base layer, an internal layer (letter color) and a top layer (background). Minimum nameplate thickness must be 1/8” (3 mm). Nameplates must be attached to equipment with machine screws or pop-rivets. The lettering height, letter color and background must be as indicated below:

System	Background Color	Letter Color
Utility Power	White	Black
Emergency Power	Yellow	Black
Standby Power	Orange	Black
Fire Alarm	Red	White

B. Nameplate Legend Schedule will be as follows:

Type		Information required
'A'	Line 1:	Equipment Designation (1" high letters)
	Line 2:	Voltage, phase, No. wires (1/4" high letters)
	Line 3:	Incoming feeder designation (1/4" high letters)
'B'	Line 1:	Load description (1/4" high letters)
	Line 2:	Breaker trip or fuse rating (1/4" high letters)
'C'	Line 1:	Transformer KVA rating (1" high letters)
	Line 2:	Designation of panel served (1/2" high letters)
	Line 3:	Incoming feeder designation (1/4" high letters)
'D'	Line 1:	Feeder designations (1/4" high letters)
'E'	Line 1:	Cabinet Designation (1" high letters)
'F'	Line 1:	Description of operation and equipment controlled (1/2" high letters)

C. Laminated engraved nameplates must be provided for all electrical equipment, including, but not limited to, the following:

ITEM	NAMEPLATE TYPE
Distribution panelboards	A
Main and branch devices in distribution panelboards	B
Lighting, Receptacle and Power panelboards	A
Dry type transformers	C
Safety switches	B
Pullboxes and cable tap boxes	D
Strip cabinets	E
Pushbuttons, pilot lights, etc. for motor controls	F
Single pole switches used for motor disconnect switch	B
Control panels	E
Switchgear	A
Main and feeder devices in switchgear	A
Switchboards	A
Main and feeder devices in switchboard	B
Motor Control Centers (MCC)	A
Motor starters in MCC’s and individual starters	B
Automatic Transfer Switch	D

2.2 LABELS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Brady

2. Seton Identification Products
3. Ideal Industries, Inc.
4. Or approved equal

B. Labels – Self-adhesive vinyl, appropriately sized for the require information. Labels must comply with OSHA, NFPA and ANSI requirement and standards.

2.3 WIRE MARKERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Ideal Industries, Inc.
2. DYMO
3. Brady
4. Or approved equal

B. Description: Plastic impregnated cloth tape, pre-printed with letters or numbers. These markers must be utilized for branch circuit conductors.

C. Description: Heat shrinkable wire markers, custom machine printed prior to installation. These markers must be utilized for feeder and branch circuit conductors.

D. Legend:
1. Power and Lighting Circuits: Branch circuit or feeder number. Black letters on white background for normal power, black letters on yellow background for emergency power, black letters on orange background for standby power.
2. Control Circuits: Control wire number as indicated on shop drawings.

2.4 CONDUIT AND RACEWAY MARKERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Brady
2. Ideal Industries, Inc.
3. Seton Identification Products.
4. Or approved equal.

B. Conduit Markers – Normal and Standby: Self-adhesive vinyl, appropriately sized for the conduit size. Letters must be black on an orange background. Labels must identify the circuit contained within the conduit and must be installed on all feeder conduits, including normal and standby power. Where the conduits are exposed, the labels must be applied at a maximum spacing of 20 feet.

C. Conduit Markers – Emergency: Self-adhesive vinyl, appropriately sized for the conduit size. Letters must be black on a yellow background. Labels must identify the circuit contained within the conduit and must be installed on all emergency feeder conduits. Where the conduits are exposed, the labels must be applied at a maximum spacing of 10 feet.

D. Legend:
1. 208 Volt System: 208/120 Volts for 4-wire feeders. 208 Volts for 3-wire feeders.
2. 480 Volt System: 480/277 Volts for 4-wire feeders. 480 Volts for 3-wire feeders.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Pre-drill holes in equipment covers for installation of nameplates prior to energizing the equipment. Vacuum the interior of electrical enclosures to remove all metal chips.

3.3 EXISTING WORK

A. Install identification on existing equipment to remain in accordance with this section.

B. Install identification on unmarked existing equipment.

C. Replace lost or missing nameplates, warning labels and circuit markers.

3.4 INSTALLATION

A. Install identifying devices after completion of painting.

B. Nameplate Installation:
1. Install nameplate parallel to equipment lines.
2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant machine screws or pop-rivets.
3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners.
4. Secure nameplate to equipment front using stainless steel machine screws, or pop-rivets.
5. Install nameplates for the following:
    a. Switchgear and Switchboards.
    b. Service Disconnects.
    c. Panelboards.
    d. Transformers.
    e. Enclosed Switches (fused and non-fused).
    f. Combination Motor Starters.
    g. Enclosed Motor Starters.
    h. Enclosed Contactors.
    i. Control Panels.

C. Label Installation:
1. Install label parallel to equipment lines.
2. Install label for identification of individual control device stations.

3. Install Arc-Flash warning labels on all electrical equipment, including switchgear, switchboards, transformers, panelboards, enclosed switches, motor starters (enclosed and combination), enclosed contactors and control panels.
4. Install labels for permanent adhesion.

D. Wire Marker Installation:
1. Install wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes and each load connection.

E. Conduit and Raceway Marker Installation:
1. Install conduit and raceway marker for each conduit and raceway longer than 10-feet.
2. Conduit and Raceway Marker Spacing: 20 feet on center.
3. Raceway Painting: Identify conduit using field painting in accordance with Section 09 90 00.
   a. Paint each conduit exposed in mechanical and electrical rooms.
   b. Color:
      1) 208 and 208/120 Volt normal and standby power systems: Black-Lettering/Orange-Background.
      2) 208 and 208/120Volt emergency power system: Black-Lettering/Yellow-Background.
      3) 480 and 480/277 Volt normal and standby power systems: Black-Lettering/Orange-Background
      4) 480 and 480/277 Volt normal and emergency power systems: Black-Lettering/Yellow-Background.

END OF SECTION 26 05 53

SECTION 26 05 73 - POWER SYSTEM STUDIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:
   1. Fault protection and coordination study for the complete electrical system from the point of entry (POE) to the service switchboard through the 208/120 and 480/277 volt distribution system to lighting or receptacle panelboards that are installed under this scope of work.
   2. Fault protection and coordination study for the complete emergency electrical system from the standby generator through the automatic transfer switches to distribution and branch circuit panelboards.
   3. Prepare an Arc Flash and Shock Hazard Analysis to comply with the requirements of NFPA 70E. This study must begin at the service entrance, through the electrical system to the panelboards (both distribution and branch circuit) and include all motor starters, equipment control panels and equipment controllers that are installed under this scope of work.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: For computer software program to be used for studies.

1.4 ACTION SUBMITTALS

A. Qualification Data: For coordination-study specialist, refer to Article 1.5 C. in this Section for qualification requirements.

B. Product Certificates: For coordination-study and fault-current-study computer software programs, certifying compliance with IEEE 399.

C. Other Action Submittals: The following submittals must be made after the approval process for system protective devices has been completed. Submittals must be in both hard copy and in digital form.
   1. Coordination-study input data, including completed computer program input data sheets.
   2. Study and Equipment Evaluation Reports.
   3. Coordination-Study Report.
   4. Setting Report.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Studies must use computer programs that are distributed nationally and are in wide use. Software algorithms must comply with requirements of standards and guides specified in this Section. Manual calculations are not acceptable.

C. Coordination-Study Specialist Qualifications: Experienced in the application of computer software used for coordination and short circuit studies, having performed successful studies on projects of similar scope and magnitude on electrical distribution systems using similar devices.
   1. A Professional Engineer licensed in the State of New York must be responsible for the study. All elements of the study must be performed by this Engineer.

D. Comply with IEEE 242 for short-circuit currents and coordination time intervals. Refer to Chapter No. 2 and Chapter No. 14.

E. Comply with IEEE 399 for general study procedures.

1.6 WARRANTY

A. Furnish five-year manufacturer warranty for computer software and computer software program requirements.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. SKM Systems Analysis, Inc.
   2. CGI CYME.
   3. EDSA Micro Corporation.
   4. ESA Inc.
   5. Or approved equal

2.2 COMPUTER SOFTWARE PROGRAM REQUIREMENTS

A. Comply with IEEE 399.

B. Analytical features of fault-current-study computer software program must include the following minimum analytical features as listed in IEEE 399:
   1. Capability to analyze the power distribution system containing more than one voltage level.
   2. Radial systems configurations.
   3. Ground faults (Line-to-Ground and Line-to-Line-Ground).
   4. Series faults.
   5. Arcing faults.
   6. Supports complex arithmetic.

7. Capability to interface with power flow.
8. Evaluate the currents (phase and magnitude) for all three phases.
9. Evaluate currents in all three sequences (positive, negative and zero sequence).
10. Capabilities to calculate on-bus-away fault contributions.
11. Capability to monitor the fault values at other locations within the distribution system and monitor voltage values at non-fault buses.
12. Protection coordination interface.
13. Generate input data reports.
14. Generate summary reports.
15. Capability of utilizing Per-unitization values for equipment data.
16. Capability to evaluate remote and local fault contributions.
17. Capability to evaluate first cycle fault currents, interrupting fault currents and fault current per IEEE Standard 37.010.
18. Incorporate multiplying factors per IEEE Standard C37.13, symmetrical current multiplying factors per IEEE Standard C37.010 and total current multiplying factors per IEEE Standard C37.5.
19. Capability to adjust impedance values based on rotating machinery contributions including X/R ratios.
20. Capability to include transformer characteristics for phase shifts.
21. Capability to separate X and R reduction for X/R ratios.
22. Incorporate X/R ½ cycle and peak multiplying factors per IEEE standard C37.010.

C. Computer software program must be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program must report device settings and ratings of all overcurrent protective devices and must demonstrate selective coordination by computer-generated, time-current coordination plots.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.
   1. Proceed with coordination study only after relevant equipment submittals have been assembled.
   2. The Contractor must be responsible for incorporating the approved recommendations of the short circuit study, coordination study and the arc fault study as outlined.

3.3 POWER SYSTEM DATA

A. Gather and tabulate the following input data to support coordination study:
   1. Product Data for overcurrent protective devices specified in other electrical Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are

consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.

2. Impedance of utility service entrance. Obtain available fault current from Consolidated Edison of New York.
3. Electrical Distribution System Diagram.
4. The Coordination study must include the existing switchboards where the connections are being made to existing switches or circuit breakers.
5. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.
6. Cables: Indicate conduit material, sizes of conductors, conductor material, insulation, and length.
7. Circuit-breaker and fuse-current ratings and types.
8. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:
    a. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.
    b. Time-current-characteristic curves of devices indicated to be coordinated.
    c. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
    d. Panelboards, switchboards, motor-control center ampacity, and interrupting rating in amperes rms symmetrical.

3.4 SCOPE

A. The fault protection and coordination study must include the following, as well as any related data required for substantiation and clarification of the study:
    1. Complete fault current and system protective device coordination data from the service pick-up at Con Edison’s transformer vault and from the standby generator through the building main service gear.
    2. A complete set of time-current coordination curves, starting with devices protecting the service down through and including all feeder, sub-feeder and secondary main and branch circuit protective devices.
    3. A tabulation of any cases where selective coordination is unobtainable and of the consequences of a downstream fault on upstream continuity of supply.
    4. Complete data on generator short-circuit transient and sustaining currents, ground fault current, and auto-transfer switching time.

B. Prepare an Arc-Flash and Shock Hazard Analysis to comply with the requirements of NFPA 70E.
    1. Perform a Shock and Arc-Flash hazard analysis and Arc-Flash energy calculation in accordance with the requirements of NFPA 70E. The Incident Energy level and the Arc-Flash Protection Boundary must be determined using the available fault current. Calculations must be based on IEEE 1584 calculation model.
    2. Data utilized to perform the Fault Current study must be utilized to prepare the Arc-Flash hazard and energy calculations.
    3. The Electrical Hazard analysis must include the following equipment:
        a. Service entrance/CT cabinet.
        b. Service Switches.
        c. Distribution panels.

d. Automatic transfer switches.
e. Branch circuit panels.
f. Motor Starters.
g. Engine generator.

C. Report Contents – Arc-Flash:
1. The completed studies must include the following:
a. Name or description of each point assessed.
b. Voltage exposure level at each location.
c. Available 3-phase bolted fault current.
d. Hazard Risk Category.
e. Arc-Flash Protection Boundary.
f. Working distance.
g. Incident Energy (in cal/cm2).
h. Required Personal Protective Equipment (PPE).
i. Assessment date.
j. Commentary regarding results and how to lower hazards if reasonably attainable.

D. Report Contents – Shock Hazard Analysis:
1. The completed studies must include the following:
a. Shock Protection Boundaries for limited approach, restricted approach and prohibited approach.
b. Required Personal Protective Equipment (PPE).

E. Warning Labels:
1. Label all equipment that may be worked on while energized with Warning Labels.
2. Provide detailed warning labels for each piece of equipment that conforms to the approved Arc-Flash Hazard Analysis and meets NFPA 70E requirements. Components of the warning labels must include the following:
a. System Voltage.
b. Available Fault Current.
c. Hazard Risk Category.
d. Incident Energy.
e. Arc-Flash Protection Boundary.
f. Shock Approach Boundaries.
g. Required PPE.
h. Equipment identification.
i. Date of Assessment.
j. Name of Company who completed the study.
3. Provide warning labels that meet ANSI Z535.4 requirements, including but not limited to, the following:
a. Label size.
b. Label color.
c. Font Size.
d. Use of appropriate “Signal” words:
1) Warning for HRC 4 or less.
2) Danger for over HRC 4.
3) Danger for components or equipment that have insufficient AIC ratings for the available fault-current or are over-dutied.

e. Label Material:
   1) Self-adhesive, capable of adhering to a variety of materials, including but not limited to, stainless steel, painted enamel, powder coated metal, polypropylene or textured ABS.
   2) Glossy polyester material.
   3) Chemical and oil resistant.
   4) Approved for indoor use and temperature.
   5) UV protected and approved for outdoor use (as required).

f. Production of Warning Labels:
   1) Commercially available Engineering software generated.
   2) Pre-printed label stock.
   3) Customized label stock.

3.5 SELECTION OF EQUIPMENT

A. The final selection and setting of all protective devices must be based on the approved study.

3.6 TIMELY SUBMISSION

A. This study must be submitted prior to submission of shop drawings for any Service, Distribution or Standby System equipment.

END OF SECTION 26 05 73

SECTION 26 08 00 - COMMISSIONING OF 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. Commissioning process requirements for Electrical systems, assemblies and equipment.

B. Related Sections:
   1. DDC General Conditions Section 01 91 13 “General Commissioning Requirements for MEP Systems" for general commissioning process requirements.

1.3 DESCRIPTION

A. Commissioning is a systematic process of confirming that all building systems perform interactively according to the Owner’s Project Requirements and the Basis of Design and continuing through construction, acceptance and the warranty period with actual verification of performance.

B. The Commissioning process does not take away from or reduce the responsibility of the Contractor to provide a finished and fully functioning product.

C. The CxA directs and coordinates the commissioning activities and reports to the Commissioner. All members in the construction process work together to fulfill their contracted responsibilities and meet the objectives of the Owner’s Project Requirement’s as detailed in the Contract Documents.

1.4 DEFINITIONS

A. Refer to DDC General Conditions for definitions.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. The CxA will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The CxA will notify the Contractor, or Commissioner as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission. The CxA will receive a copy of the final approved submittals.

C. The CxA will receive a copy of the final approved submittals.

D. In addition, the contractor is to provide the following:
   1. Certificates of readiness.
   2. Certificates of completion of installation, prestart, and startup activities.
   3. O&M manuals.
   4. Test reports.

E. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" and Section 01 91 13 "General Commissioning Requirements for MEP Systems" for general commissioning submittal requirements.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Test Equipment Calibration Requirements: Contractor will comply with test manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately after instruments have been repaired resulting from being dropped or damaged. Affix calibration tags to test instruments. Furnish calibration records to CxA upon request

1.7 COORDINATION

A. Commissioning Kick-Off Meeting – Construction Team: The Contractor will attend a meeting of the Commissioning Team, chaired by the CxA, to review the scope of commissioning process activities and the Commissioning Plan with discussions on milestones, activities, and assignments of responsibilities. The flow and type of documents and the amount of submittal data given to the CxA will be determined. Meeting minutes will then be distributed to all parties by the CxA.

B. Commissioning Meetings: The Contractor will attend coordination meetings with the Commissioning Team, chaired by the CxA, to review progress on the Commissioning Plan, construction deficiencies, scheduling conflicts, and to discuss strategies and processes for upcoming commissioning process activities.

C. Miscellaneous Construction Meetings: The CxA attends selected planning and job-site meetings in order to remain informed on construction progress and to update parties involved in the commissioning process.

D. Pre-testing Meetings: The Contractor will attend pretest meetings with the Commissioning Team, chaired by the CxA, to review startup reports, pre-test inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested.

E. Testing: The Contractor will coordinate with testing personnel and agencies for timing and access for CxA to witness test.

F. Manufacturers' Inspection and Startup Services: The Contractor will coordinate services of manufacturers' inspection and startup services.

G. Testing, Adjusting and Balancing: The Contractor will coordinate with plan and schedule for testing, adjusting and balancing for timing and access for CxA to witness process.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

A. All standard testing equipment required to perform startup, initial checkout and functional performance testing shall be provided by the Contractor for the equipment being tested. For example, the Contractor shall ultimately be responsible for all standard testing equipment for the electrical systems and controls systems in Division 26. A sufficient quantity of two-way radios shall be provided by the Contractor.

B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed. Proprietary test equipment (and software) shall become the property of the City of New York upon completion of the commissioning process.

C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to accuracy of 0.5°F and a resolution of ±0.1°F. Pressure sensors shall have an accuracy of ±2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL DOCUMENTATION REQUIREMENTS

A. With assistance from the Contractor and the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems.

B. Red-lined Drawings (As-Builts): The Contractor will verify all equipment, systems, instrumentation, wiring and components are shown correctly on red-lined drawings. Preliminary, red-lined drawings must be made available to the Commissioning Team for use prior to the start of Functional Performance Testing. Changes, as a result of Functional Testing, must be incorporated into the final as-built drawings, which will be created from the red-lined drawings. The Contractor will create the as-built drawings.

C. Operation and Maintenance Data: Contractor will provide a copy of O&M literature within 45 days of each submittal acceptance for use during the commissioning process for all commissioned equipment and systems. The CxA will review the O&M literature once for conformance to project requirements. The CxA will receive a copy of the final approved O&M literature once corrections have been made by the Contractor.

D. Demonstration and Orientation: Contractor will provide demonstration and orientation as required by the specifications. A complete orientation plan and schedule must be submitted by the Contractor to the CxA

four weeks (4) prior to any orientation. An orientation agenda for each orientation session must be submitted to the CxA one (1) week prior the orientation session.

3.3 CONTRACTOR'S RESPONSIBILITIES

A. Refer to DDC General Conditions Section 01 91 13 “General Commissioning Requirements for MEP Systems” for Contractor’s responsibilities.

B. Attend construction phase controls coordination meetings.

C. Provide information requested by the CxA for final commissioning documentation.

D. Prepare preliminary schedule for Electrical system orientations and inspections, operation and maintenance manual submissions, orientation sessions, equipment start-up and task completion for The City of New York. Distribute preliminary schedule to commissioning team members.

E. Provide measuring instruments and logging devices to record test data, and provide data acquisition equipment to record data for the complete range of testing for the required test period.

F. Provide detailed startup procedures.

G. Provide a written list of all user adjustable set-points and reset schedules with a brief discussion of the purpose of each and the range of reasonable adjustments with energy implications

H. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.

I. Respond to provided new deficiencies and/or responses within five (5) business days

J. Gather operation and maintenance literature on all equipment, and assemble in binders as required by the specifications. Submit to CxA 45 days after submittal acceptance.

K. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.

L. Notify the CxA a minimum of two weeks in advance of the time for start of the testing and balancing work. Attend the initial testing and balancing meeting for review of the official testing and balancing procedures.

M. Provide written notification to the Commissioner and CxA that the following work has been completed in accordance with the contract documents, and that the equipment, systems, and sub-system are operating as required.
   1. Electrical equipment including switchgear, panel boards, motor control centers, lighting, receptacles, dimmers and all other equipment furnished under this Division.

N. The equipment supplier shall document the performance of the equipment.

O. Provide a complete set of red-lined drawings to the CxA prior to the start of Functional Performance Testing.

P. Contractor responsibilities to be completed by Equipment Suppliers:
   1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the City of New York's personnel, to keep warranties in force.
   2. Assist in equipment testing.
   3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

3.4 CxA'S RESPONSIBILITIES

A. Roles and Responsibilities:
   1. Refer to DDC General Conditions Section 01 91 13 "General Commissioning Requirements for MEP Systems" for general CxA responsibilities.

3.5 TESTING PREPARATION

A. Certify in writing to the CxA that Electrical systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.

B. Certify in writing to the CxA that Electrical instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.

C. Certify in writing that testing procedures have been completed and that testing reports have been submitted, discrepancies corrected, and corrective work approved.

D. Place systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).

E. Inspect and verify the position of each device and interlock identified on checklists.

F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.

G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

3.6 GENERAL TESTING REQUIREMENTS

A. Provide technicians, instrumentation and tools to perform commissioning test at the direction of the CxA.

B. Scope of Electrical testing shall include the entire Electrical installation, from the incoming power equipment throughout the distribution system. Testing shall include measuring, but not limited to resistance, voltage, and amperage of system(s) and devices.

C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.

D. The CxA along with the Electrical trade and other subcontractors, including the fire alarm Subcontractor shall prepare detailed testing plans, procedures, and checklists for Electrical systems, subsystems, and equipment.

E. Tests will be performed using design conditions whenever possible.

F. Simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by the CxA and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.

G. The CxA may direct that set points be altered when simulating conditions is not practical.

H. The CxA may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are not practical.

I. If tests cannot be completed because of a deficiency outside the scope of the Electrical system, document the deficiency and report it to the Commissioner. After deficiencies are resolved, reschedule tests.

J. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

3.7 ELECTRICAL SYSTEMS, SUBSYSTEMS AND EQUIPMENT TESTING PROCEDURES

A. Equipment Testing and Acceptance Procedures: Testing requirements are specified in individual Division 26 sections. Provide submittals, test data, inspector record, infrared camera and certifications to the CxA.

B. Electrical Instrumentation and Control System Testing: Field testing plans and testing requirements are specified in Division 23 Sections "Direct-Digital Control System for HVAC" and "Sequence of Operations for HVAC Controls" Assist the CxA with preparation of testing plans.

C. Electrical Distribution System Testing: Provide technicians, load banks, infrared cameras, instrumentation, tools and equipment to test performance of designated systems and devices at the direction of the CxA. The CxA shall determine the sequence of testing and testing procedures for each equipment item and pipe section to be tested.

D. Vibration and Sound Tests: Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.

E. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. The following equipment and systems shall be evaluated:
1. Automatic temperature controls integrated with the electrical systems
2. Panelboards
3. Power Distribution System
4. Lighting Controls

3.8 DEFICIENCIES/NON-CONFORMANCE, FAILURE DUE TO MANUFACTURER DEFECT

A. Deficiencies/Non-Conformance:
   1. The CxA will record the results of the functional test on the test form. All deficiencies or non-conformance items shall be noted and reported to the Commissioner and Contractor on a standardized form.
   2. The Contractor shall respond to new deficiencies within five (5) business days. The response shall indicate the proposed means of correcting the issue and the anticipated date of correction. If further information is required to clarify the issue, the Contractor's response shall include a request such clarification. If the Contractor understands that the issue has been resolved or was noted in error, the Contractor's response shall provide an explanation of their reasoning, including reference to Contract Documents as necessary.
   3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA.
   4. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.
   5. As tests progress and a deficiency is identified, the CxA discusses the issue with the Contractor.
   6. When the issue does not require further clarification for the Contractor to resolve, the CxA documents the deficiency and the Contractor's response and corrections or plans for correction. The CxA and the Contractor then proceed to another test or sequence. Once the Contractor corrects the deficiency, the test is rescheduled and repeated to demonstrate correct operation or function.
   7. When additional information is required about any deficiency, whether to clarify the issue or to clarify the means of resolution or acceptance, the CxA documents the deficiency and the Contractor's response. The CxA will send the deficiency to the Commissioner and the Contractor, who shall forward to any subcontractors required for the correction. Once all parties are in agreement as to the means of resolving the issue, the CxA will document the agreed-upon resolution process. The CxA will document the correction or resolution. If the correction requires work by the Contractor, the Contractor and CxA will reschedule the test to demonstrate correct operation and function.

B. Failure due to Manufacturer Defect:
   1. If 10% or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the Contractor, CxA or Commissioner. In such case, the Contractor shall provide the Commissioner with the following:
      a. Within one week of notification from the Contractor the manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the Commissioner within two weeks of the original notice.
      b. Within two weeks of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
      c. The Contractor, CxA, or 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 CxA or Commissioner will decide whether to accept the solution.

e. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

3.9 APPROVAL

A. The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA. The CxA recommends acceptance of each test to the Commissioner using a standard form.

3.10 SEASONAL TESTING

A. Seasonal Testing – During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the Contractor, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and record documents due to seasonal testing will be made by the Contractor.

3.11 OPERATION AND MAINTENANCE MANUALS

A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in the DDC General Conditions Section 01 78 39 "Contract Record Documents and Section" 019113 "General Commissioning Requirements for MEP Systems."

B. The specific content and format requirements for the standard O&M manuals are detailed in the DDC General Conditions Section 01 78 39 "Contract Record Documents" and Section 01 91 13 "General Commissioning Requirements for MEP Systems." Special requirements for the controls subcontractor and TAB contractor are found in Division 26.

C. CxA Review and Approval – Prior to substantial completion, the CxA shall review the O&M manuals, documentation and record documents for systems that were commissioned to verify compliance with the Specifications. The CxA will communicate deficiencies in the manuals to the Contractor, or Commissioner, as requested. Upon a successful review of the corrections, the CxA recommends approval and acceptance of these sections of the O&M manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

3.12 INSTRUCTION OF THE CITY OF NEW YORK PERSONNEL

A. The Contractor shall be responsible for instruction coordination, scheduling, and ultimately for ensuring that instruction is completed.

B. The CxA shall oversee the instruction of the City of New York's personnel for commissioned equipment and systems.
   1. The CxA shall interview the City of New York's personnel to determine the special needs and areas where instruction will be most valuable. The Commissioner and CxA shall decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA shall communicate the results to the Contractor who will ensure participation of the subcontractor.

2. In addition to these general requirements, the specific instruction requirements of the City of New York's personnel by the Contractor who will ensure the subcontractors and vendors are specified in the individual sections listed in DDC's General Conditions Section 01 79 00 "Demonstration and Owners' Pre-Acceptance Orientation."
3. The Contractor shall ensure that each subcontractor and vendor responsible for instruction will submit a written instruction plan to the Contractor for review and approval prior to instruction. The Contractor will submit one comprehensive instruction plan to the CxA and the Commissioner.
4. The plan will be reviewed by the CxA and the Commissioner. Comments pertaining to its deficiencies will be forwarded to the Contractor. The instruction plan will be rewritten until approved by the CxA and the Commissioner. The final approved instruction plan will cover the following elements:
    a. Equipment (included in instruction)
    b. Intended audience
    c. Location of instruction
    d. Objectives
    e. Subjects covered (description, duration of discussion, special methods, etc.)
    f. Duration of instruction on each subject
    g. Qualified instructor for each subject
    h. Instructor qualifications
    i. Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)
5. For the primary equipment, the Contractor will ensure the controls subcontractor provides a discussion of the control of the equipment during the instruction conducted by each subcontractor or vendor.
6. Instruction documentation shall include the following items:
    a. Copy of the instruction plan, including schedule, syllabus, and agenda.
    b. Copy of the Owner's Project Requirements.
    c. Copy of the Basis of Design.
    d. Compiled operations manuals.
    e. Compiled maintenance manuals.
    f. Completed manufacturer instruction manuals.
    g. Red-lined drawings.
7. The CxA develops criteria for determining that the instruction was satisfactorily completed, including attending some of the instruction, etc. The CxA recommends approval of the instruction to the Commissioner using a standard form. The Commissioner signs the approval form/letter template.
8. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment
9. Video recording of the instruction sessions will be verified by the CxA in electrical format, at the discretion of the Commissioner.

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SECTION 26 09 43 - NETWORK LIGHTING CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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. Wireless digital addressable lighting control system.

1.3 REFERENCES

A. American National Standards Institute/ (ANSI) (www.ansi.org)
   1. C62.41-1991 – Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.

B. Institute of Electrical and Electronic Engineers (IEEE) (www.ieee.org)
   1. 802.3af-2003 – Power over Ethernet standard

C. International Electrotechnical Commission (www.iec.ch)
   1. IEC/EN 61000-4-2:2009 Electrostatic Discharge Testing Standard.

D. International Organization for Standardization (ISO) (www.iso.ch)
   1. 9001:2000 – Quality Management Systems.

E. National Electrical Manufacturers Association (NEMA) (www.nema.org)
   1. WD1 (R2005) - General Color Requirements for Wiring Devices.

F. Underwriters Laboratories, Inc. (UL) (www.ul.com)
   1. 916 – Energy Management Equipment

G. Federal Communications Commission (FCC) (www.fcc.gov)
   1. Title 47 CFR Part 15 Class A

1.4 SYSTEM DESCRIPTION

A. The wireless lighting control system must be capable of providing all of the following functions for all lighting:
   1. Continuous dimming and automatic on/off controls.
   2. Occupancy control.
   3. Vacancy control.
   4. Daylight harvesting.
   5. Load management.

6. Multi-level scene control
7. Scheduling
8. Demand Response
9. Task Tuning.
10. Power measurement data reporting.
11. Mobile device configuration and control
12. Automatic Code Commissioning
13. The wireless lighting control system must be capable of continuous dimming and switching allowing each fixture to monitor its local environment and provide distributed control in response to environmental changes.
14. The wireless lighting control system must provide network communication of all sensor and device data for all light fixtures including power measurement, occupied/unoccupied status, scene status and daylight information.
15. The wireless lighting control system must provide out-of-the-box functionality of all light fixtures with integrated sensors providing occupancy automatic On to 75% light level and automatic Off after 20 minutes. Systems that do not include out-of-the-box functionality will not be acceptable
16. The wireless lighting control system must provide a method for the installer to verify wireless communications and address all wireless devices with a single push button. Systems that require device addressing using a manual data entry method through software will not be acceptable.
17. The wireless lighting control system must provide visible indication on all wireless devices when as each wireless device joins the wireless network. Systems that do not provide a visual indicator per device to the installer will not be acceptable.
18. The wireless lighting control system must provide the capabilities for the installer to create a construction group of all wireless occupancy sensors and wireless wallstations to control all installed wireless light fixtures.
19. The wireless lighting control system must be able to be completely programmed and configured using a mobile application. Systems that require web or PC software for configuration will not be acceptable.
20. The wireless lighting control system must allow addressed wireless light fixtures with integrated sensors to be identified by shining a laser or bright flashlight into the sensor. Identified light fixtures must provide visible indication on the mobile application. Systems that do not permit reverse identification method will not be acceptable.
21. The wireless lighting control system must allow wireless wallstations, receptacles, relays and remote sensors to be identified by simple pushbutton method on each device. Identified devices must provide visible indication on the mobile application. Systems that do not permit reverse identification method will not be acceptable. The wireless lighting control system includes the following components:
    a. Integrated sensors must include passive infrared sensor, digital photocell, microprocessor, a wireless radio (IEEE 802.15.4), and a load controller for On/Off/Dim.
    b. Relay Switchpack with 0-10V control must contain a utility grade power meter chip and a latching relay to control 20Amp load and 120mA 0-10V sink. Device must include LED indication and pushbutton for device override and identification.
    c. Tilemount daylight sensor must include a digital photocell, microprocessor, a wireless radio (IEEE 802.15.4), and a load controller for On/Off/Dim.
22. Wallstation must be mains powered (120/277VAC), including the following features:
    a. Numerous button configurations, supporting small and large engraved buttons
    b. Individual button LED indication
    c. Universal light icon with raise/lower buttons

d. Each button fully programmable for Area Scene or Zone control
e. Wireless radio (IEEE 802.15.4)

23. Battery powered, wireless ceiling sensor must include passive infrared sensor, microprocessor, a wireless radio (IEEE 802.15.4), LED indication and pushbutton for device identification.
24. Receptacle control must include a constant hot and controlled plug output.
    a. The receptacle control must provide a single input for incoming power, devices that require constant hot and switched inputs will not be acceptable.
    b. The receptacle control must be clearly marked "Controlled" and with the NEMA defined controlled symbol ⏻
    c. The receptacle control must include a wireless radio (IEEE 802.15.4) to provide control and power measurement data.
25. Wireless Area Controllers must wirelessly communicate (IEEE 802.15.4) with all sensors, wallstations, relays, and receptacles to coordinate control areas, and zones. The Wireless Area Controller must support the following features:
    a. Multiple wireless radios
    b. Power over Ethernet connection to building LAN
    c. Up to 16 areas
    d. Up to 16 zones per area
    e. Area scene configurations
    f. Multiple occupancy sets per area
    g. Multiple daylight sets per area
    h. Demand Response reduction values
    i. Scheduling configuration
    j. Configuration backup and restore capabilities
    k. Automatic Code Commissioning
26. Mobile application must communicate using Wi-Fi to a single Wireless Area Controller or a building IT network with multiple Wireless Area Controllers. The Mobile application must include the following features:
    a. Ability to connect to multiple Wireless Area Controllers
    b. Administrative and user login credentials
    c. Demonstration and Live mode
    d. Automatic Code Commissioning
    e. Drag and drop or multi select programming of wireless lighting system
27. Lighting Control Applications:
    a. Minimum lighting control performance required, unless local Energy Code is more stringent.
    b. Occupancy/vacancy requirements – Provide an occupancy/vacancy sensors with Manual On/ Automatic Off or Automatic On/ Automatic Off functionality in all spaces. Manual On vacancy sensors should be used for any enclosed space with a Manual On switch that does not require hands free operation. Spaces with multiple occupants or where line of sight might be obscured ceiling or corner mount sensors and Manual wallstations would be required. Automatic On of lighting via occupancy sensor cannot exceed 50% of lighting. Systems that do that allow the user to select Occupancy or Vacancy Mode will not be acceptable.
    c. Bi-Level switching – Provide multi-level switching and/or variable dimming for maximum energy savings.
    d. Task Lighting / Receptacle Control – Provide automatic shut off of non-essential plug loads and task lighting in all spaces. Provide Manual On or Automatic On of receptacles whenever spaces are occupied. Receptacle Control will only be shut off when no occupancy is detected within

the space. Systems that do not provide receptacle control for a full 20 Amp circuit will not be acceptable.

e. Daylight Zones – Primary sidelit or toplit areas within an enclosed space must be controlled separately and automatically by individual integrated daylight sensors. Adjustments to the daylight zones must be provided by a simple to use, intuitive mobile application.

f. Provide smooth and continuous daylight dimming for areas marked on drawings. Daylighting control system may be designed to dim electric light to the lowest light level and Off.

g. Provide the ability to adjust the high end and low end trim of the dimmers to ensure the lighting automatically provides energy saving even when daylighting calls for full illumination.

h. Provide the ability for the dimmers and the relays to function separately. Systems where the 0-10V dimmers and relays are tied together reduce design capabilities and will not be acceptable.

i. Must be capable of automatically responding to a Demand Response Signal and adjusting the lighting level, without the need of programming or software. Systems that require software or commissioning to provide Demand Response integration will not be acceptable. (Required for California Title 24 2013).

j. Additional Controls:

1) Provide occupancy or vacancy sensors (Auto On or Manual On) for any enclosed office, conference, meeting or training rooms. Spaces with multiple occupants or where line of sight may be obscured require ceiling or wall/corner mounted sensors with Manual On switches.

2) Conference, meeting, training, auditoriums and multi-purpose rooms must have controls that allow for scene based and independent control of each output. Rooms larger than 300 square feet must support at least four (4) pre-set lighting scenes. Occupancy or vacancy sensors must ensure all lighting, receptacles.

3) Egress lighting control must be integral to the system. The system must provide an automatic control of adjacent corridor and/or egress lighting based upon room occupancy. Systems that do not ensure that adjacent corridor and/or egress lighting is controlled with room occupancy will not be acceptable.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Specification Conformance Document - Indicate whether the submitted equipment:

1. Meets specification exactly as stated.
2. Meets specification via an alternate means and indicate the specific methodology used.
3. Shop Drawings; include:
   a. Schematic (one-line diagram) will be specific to the project. Generic one-line diagrams will not be accepted. Provide drawing details for field installation that are specific to the project.
   b. Wiring diagrams for typical application installation configurations.
   c. Wiring diagrams for typical device installation configurations.
4. Product Data: Catalog data sheets with performance specifications demonstrating compliance with specified requirements and are specific to the project.
5. Sequence of Operation to describe how each component operates and how any building wide functionality is achieved to exceed local energy code (Title 24 2016, ASHRAE 90.1 2016, IECC 2015, or any newer versions of these codes.
6. Provide a description of the system.

7. System setup and programming to be provided by installer, certified technician or factory field service personnel.
8. Follow-up by Field Services for "fine tuning" and additional configuration to occur approximately 90 days after system turnover.

1.6 CLOSEOUT SUBMITTALS

A. Wireless lighting control system manufacturer to provide an Operation and Maintenance Manual that details the start-up procedure being performed including a process to follow, details on tests performed and an area that documents any test results.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Manufacturer: Manufacturer must have at least three (3) years of experience in the manufacture of lighting control systems. Manufacturers that do not have at least three (3) years' experience will not be acceptable.

C. System Components:
1. Listed by UL specifically for the electronic ballast/driver loads. Provide evidence of compliance upon request.
2. Listed by FCC specifically for the required wireless communication protocols. Provide evidence of compliance upon request.

1.8 DELIVERY, STORAGE AND HANDLING

A. The contractor is responsible for complete installation of the entire system according to strict factory standards and requirements.

B. Packaging: All components of the lighting control system must be packaged in a single box as a kit or as individual components. The kit catalog number will be marked on package label along with bill of materials. Individual component packages will be marked with product catalog number.

C. Handling: Packaging will include clear installation instructions for all components with typical illustrations of installation locations and connections.

1.9 PROJECT CONDITIONS

A. Do not install equipment until following conditions can be maintained in spaces to receive equipment:
1. Ambient temperature for indoor devices: 32º to 122ºF.
2. Ambient temperature for outdoor devices: -31º to 185ºF.
3. Relative humidity: Maximum 90 percent, non-condensing.
4. Wireless lighting control system must be protected from dust during installation.
5. Ambient temperature for Lighting Management Appliance: 50º to 90ºF.
6. Coordinate layout and installation of luminaries and controls with other construction.
7. Coordinate site commissioning with manufacturer no less than 21 days prior to required date.

1.10 WARRANTY

A. Provide manufacturer's enhanced 5-year limited warranty for connected devices, control devices, connected sensors and connected applications.

B. 5-year limited warranty for the replacement of defective system components from Substantial Completion.

C. Wireless fixtures with standard 0-10V dimmable ballast or driver module warranty are five (5) years.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Acuity nLight Air
2. Eaton WaveLinx
3. Lutron Vive
4. Or approved equal

2.2 CONNECTED DEVICES

A. Load control devices:
1. Product: WaveLinx Relay Switchpack with 0-10 (WSP-MV-10):
a. Plenum rated.
b. Integrated, self-contained unit consisting internally of an isolated load switching control relay and a power supply to provide low voltage power.
1) 20amp 120/277VAC General Purpose
2) 16amp 120/277VAC electronic ballast (LED load)
3) Single class 2 0-10V dimming output (IEC 60929 Annex E) sinks up to 120mA per (40 μA max per circuit leakage to line)
4) 0-10V output supports up to 60 ballasts/drivers that draw a standard 2mA each
c. Power measurement accuracy of 5%, reporting data to the Wireless Area Controller for display on the Mobile Application.
d. Must be compatible with electronic ballast, LED, incandescent, magnetic or electronic low voltage, and magnetic or electronic fluorescent, as well as motor loads.
e. Must be capable of controlling up to 20Amp receptacle or plug loads.
f. Controls incorporate non-volatile memory. Should power be interrupted and subsequently restored, settings and parameters saved in protected memory must not be lost.
g. Relay Switchpack must be FCC certified.
h. Relay Switchpack must be a Class 1 device
i. Controls incorporate non-volatile memory. Should power be interrupted and subsequently restored, settings and parameters saved in protected memory must not be lost.

2.3 CONTROL DEVICES

A. Product: Wall Stations:
1. Mains powered wireless wallstation providing multi-level control of an area or zone:
a. 120VAC input

2. Must provide individual button LED indication of status and wireless communication as well as selected button.
3. Controls incorporate non-volatile memory. Should power be interrupted and subsequently restored, settings and parameters saved in protected memory must not be lost.
4. Must be FCC certified.
5. Must be a Class 1 device
6. Wireless momentary pushbutton switches in 2, 3, 4, 5 and 6 button configuration; available in white, ivory, grey and black; compatible with wall plates with decorator opening. Wallstations must include the following features:
    a. Multi-level scene selection
    b. Scene raise/lower
    c. Toggle ON/OFF
    d. Removable buttons for field replacement with engraved buttons and/or alternate color buttons Button replacement may be completed without removing the switch from the wall.
    e. Intuitive button labeling to match application and load controls.
    f. Pre-defined digital button configurations. Each wallstation is shipped with pre-defined digital button configurations which are automatically mapped to specific area/zone controls when added to an area in the Mobile Application.
7. Multiple wallstations may be installed in an area by simply connecting them to the network. No additional configuration will be required to achieve multi-way switching.
8. Wallstations are delivered with pre-defined functions including, raise, lower, Half Lights, Full Lights, Read, Relax, Dimmed, Night, manual and scene control.
9. Optional custom labeling is available for application or location specific wallstation button labels.

2.4 CONNECTED SENSORS

A. Ceiling mounted or fixture integrated sensors.
    1. Product: Ceiling Sensor
        a. Sensing Mechanism:
            1) Infrared: Utilize multiple segmented lens, with internal grooves to eliminate dust and residue build-up.
        b. Power Failure Memory:
            1) Controls incorporate non-volatile memory. Should power be interrupted and subsequently restored, settings and parameters saved in protected memory must not be lost.
        c. Products tested in identical manner, complaint to NEMA WD 7 -2011 Occupancy Motion Sensors Standards.
        d. Sensor must have time delays from 10 to 20 min.
        e. All sensors must provide an LED as a visual means of indication at all times to verify that motion is being detected during both testing and normal operation.
        f. Sensor is battery powered by standard AA batteries.
        g. Sensor provides indication of battery life through the Mobile Application.
        h. Sensor battery life must be 10 years based on approximately 30 activations and wireless signals per day.
        i. Sensors must monitor changes in occupancy, changes in ambient light levels and communicate digital control commands to light fixtures according to a control strategy.
        j. Sensor must wirelessly transmit occupancy; light level, power to the Wireless Area Controller which allows the data to be stored in a central location on premises and displayed via the Mobile Application.

k. Sensors must be fully adaptive with the ability to have the sensitively and timing to be remotely adjusted to ensure optimal lighting control for any use of the space.
l. Sensors have remotely adjustable settings for dimming levels, occupied/unoccupied light levels, occupancy/vacancy sensing, and sensitivity to changes in motion and changes in ambient light levels.
m. Sensors have the ability to remotely adjust light output to reduced levels and remain at that reduced level for an adjustable time period before turning off when a space is vacant.
n. Programming is stored in each sensor in addition to the Wireless Area Controller. Sensors operate independently of from Wireless Area Controller, so there cannot be single point failure. Systems must operate so there is no single point of failure.
o. Responds to digital (load shed command) Demand Response signal.
p. Sets high end trim via priority assigned in profile.

2. Product: Integrated Sensor:
   a. Sensing Mechanism
      1) Infrared: Utilize multiple segmented lens, with internal grooves to eliminate dust and residue build-up.
      2) Daylight: Utilize integrated daylight sensor to provide closed loop daylight dimming control. Each Integrated Sensor provides an individual daylight dimming zone to provide highly accurate daylight levels at the work surface throughout the entire space.
   b. Power Failure Memory:
      1) Controls incorporate non-volatile memory. Should power be interrupted and subsequently restored, settings and parameters saved in protected memory must not be lost.
   c. Products tested in identical manner, complaint to NEMA WD 7 -2011 Occupancy Motion Sensors Standards.
   d. Sensor must have time delays from 10 to 20 min.
   e. Sensor must provide unique daylight calibration taking into account for light level at the sensors, work surface and integrated luminaire light output.
   f. All sensors must provide an LED as a visual means of indication at all times to verify that motion is being detected during both testing and normal operation.
      1) Green LED indication when sensor is in out-of-the-box operation mode.
      2) White LED indication when sensor has been connected to the wireless lighting control system.
   g. Test mode- fifteen second time delay.
   h. Walk-through mode.
   i. Sensors are RoHS compliant.
   j. Sensor must provide out-of-the-box functionality of occupancy detection, directly controlling integrated fixture.
      1) Occupied default light level is 75%.
      2) Unoccupied default light level is OFF.
      3) Occupancy default time out is 20 minutes.
   k. Sensors must monitor changes in occupancy, changes in ambient light levels and communicate digital control commands to light fixtures according to a control strategy.
   l. Sensor must wirelessly transmit occupancy; light level, power to the Wireless Area Controller which allows the data to be stored in a central location on premises and displayed via the Mobile Application.
   m. Sensors must be fully adaptive with the ability to have the sensitively and timing to be remotely adjusted to ensure optimal lighting control for any use of the space.

n. Sensors have remotely adjustable settings for dimming levels, occupied/unoccupied light levels, occupancy/vacancy sensing, and sensitivity to changes in motion and changes in ambient light levels.
o. Sensors have the ability to remotely adjust light output to reduced levels and remain at that reduced level for an adjustable time period before turning off when a space is vacant.
p. Programming is stored in each sensor in addition to the Wireless Area Controller. Sensors operate independently of from Wireless Area Controller, so there cannot be single point failure. Systems must operate so there is no single point of failure.
q. Responds to digital (load shed command) Demand Response signal.
r. Sets high end trim via priority assigned in profile.

3. Product: Daylight Sensor:
   a. Sensing Mechanism:
      1) Daylight: Utilize Tilemount daylight sensor to provide closed loop daylight dimming control to a circuit of connected fixtures.
   b. Power Failure Memory:
      1) Controls incorporate non-volatile memory. Should power be interrupted and subsequently restored, settings and parameters saved in protected memory must not be lost.
   c. Tilemount sensor connects to a control module which supports up to 3Amps of connected fixtures.
   d. Tilemount is designed to be installed in a ½" or ¾" ceiling tile within 54" of the control module and connected fixtures.
   e. Sensor must provide unique daylight calibration taking into account for light level at the sensors, work surface and integrated luminaire light output.
   f. All sensors must provide an LED as a visual means of indication and diagnostics.
   g. Sensors are RoHS compliant

B. Control Module:
1. Sensor must connect to a 0-10V dimmable ballast or driver via a control module or connect to a enabled drivers without the use of control module.
2. Sensor must connect to a controller via a low voltage cable for interior applications.
3. If power dropouts in the event of a brown-out or black-out, when power is restored, the lighting system should recover quickly and automatically return to the last lighting levels. A momentary interruption (1 or 2 seconds) of power should not cause extended periods (20 seconds or more) without lighting while the system reboots and all other electrical equipment is back on.
4. Control Module must be installed by luminaire manufacturer and is shipped as an integral component to the luminaire.
5. Sensor must be FCC certified.
6. Sensor must be a Class 2 device.
7. System must support user initiated manual demand response and utility or BMS initiated automatic demand response.
8. Control Module Components:
   a. Power Measurement capable of 5% power measurement accuracy.
   b. Controller to include latching relay, to decrease power requirements of the power pack.
   c. Operate Bounce Time: 3 ms. Max.
   d. Max Switching Voltage 277VAC and 125VDC.
   e. Insulation Rating: Class B and Class F.
   f. Operations:
      1) Control Module and Sensor must communicate energy usage Wireless Area Controller.

g. Electrical/Connections:
   1) Circuit protection:
      a) Listed to UL 916.
      b) FCC Part 15 Class A certified.
h. Manufacturer to pre-wire control module in fixture.
i. Control module must be plenum rated.
j. Connection between sensors and control module must be Class 2, 18-24 AWG, stranded or solid depending on the application U.L Classified, PVC insulated or TEFLON jacketed cable suitable for use in plenums.

2.5 CONNECTED SPACES

A. Wireless Area Controller
1. Spaces must be equipped with an automatic control device to shut off lighting in those areas. This automatic control device must function on either:
   a. A scheduled basis, using time of day, with an independent program schedule that controls the interior lighting in areas that do not exceed 5,000 square feet and are not more than one floor.
   b. An occupant sensor that must turn lighting off within 20 minutes of an occupant leaving a space.
   c. A signal from another control or alarm system that indicates the area is occupied.
2. Provide Wireless Area Controllers in the locations and capacities as indicated on the plans and schedules. Each Wireless Area Controller must have the following capabilities:
   a. The Wireless Area Controller is a server class appliance that discovers, programs and manages connected devices, connected sensors and connected Apps.
   b. Uses industry standard HTTPS security with AES-128 encryption safeguards the integrity of the entire system. Backups prevent data loss and restore fixtures to operational modes. It constantly monitors areas to ensure that spaces are managed according to the assigned user preferences and tasks being performed.
   c. Powered-over-Ethernet (PoE) at 48V device, utilizes the building PoE network switches or a PoE injector for power and network connection.
   d. Maximum CAT 5e cable distance between the Wireless Area Controller and a network PoE switch is 330 feet. Care must be taken when routing the cable to not exceed the 330-foot limitation including travel distance up and down structures.
   e. Wi-Fi access point and wireless client capabilities. Wi-Fi capabilities are automatically disabled if the Wireless Area Controller is physically connected to a building LAN and receives an IP address. Systems that allow multiple simulations methods of network connection (Wi-Fi & LAN) will not be acceptable.
   f. 2.4 GHz Transceiver for IEEE 802.15.4 wireless radio for communication to connected devices and sensors.
   g. Must support AES 128-bit encryption.
   h. LED indicators for status of various wireless radios and communications.
   i. Must be FCC Part 15 Class A, RoHS certified.
   j. Wireless Area Controller connection cables must be plenum rated.
   k. Must be Class 2 devices.
3. Scalability and Data Integrity:
   a. The Wireless Area Controller can be deployed as a dedicated installation managing up to 200 wireless device (connected devices, connected sensors). When deployed as a dedicated

installation the Wireless Area Controller acts as a local wireless access point for Wi-Fi connection method to the Mobile Application.

b. The Wireless Area Controller can be deployed as a network installation managing up to 200 wireless devices (connected devices, connected sensors) per Wireless Area Controller. When deployed as a network installation the Wireless Area Controller connects to the building LAN or wireless network as a client using DHCP. The maximum number or Wireless Area Controllers on the building network is dependent upon the building network configuration.

2.6 CONNECTED APPLICATIONS

A. Mobile Application:
1. Administrative programming and editing may be conducted via an intuitive iOS or Android mobile application.
2. Mobile must support the following features:
a. Network discovery of multiple Wireless Area Controllers
b. Naming and identification of Wireless Area Controllers
c. Unique administrative login credentials for each Wireless Area Controller
d. Discovery of wireless devices per Wireless Area Controller (Find Devices)
e. Creation of up to 16 Areas per Wireless Area Controller
f. Creation of up to 16 Zones per area
g. Creation of multiple Occupancy Sets per area
h. Creation of Daylight Sets for each integrated luminaire
i. Creation of Demand Response values for each area
j. Definition of scene values for each area
k. Definition of schedules for each Wireless Area Controller
l. Blink identification and reverse identification of each connected devices and sensor
m. Identified connected devices and sensors will indicate on the Mobile Application their selection by the device icon pulsing on the screen.
n. Ability to utilize drag and drop, multi select and filter capabilities for easy association of connected devices and sensors to a defined area.
o. Automatic Code Commissioning features include:
1) Automatic association of all devices added to an area to provide a California Title 24 2016 code compliant sequence of operations.
2) All occupancy sensors are joined together to provide an Automatic On to 50% light level.
3) All occupancy sensors are joined together to provide an Automatic Off of all luminaires and plug loads after 20 minutes of unoccupancy.
4) Automatic closed loop daylighting to approximately 500lux .
5) Automatic wallstation button mapping providing the dominant button providing a 50% light level all other buttons provide multi-level dimming control from 30%-100%.
6) Automatic display of area power measurement data.
7) Automatic Demand Response of 20%.
p. Additional screens if needed to adjust Automatic Code Commissioning settings.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. The control system must be installed and fully wired as shown on the plans by the installer. Complete all electrical connections to all control circuits.

B. Install the work of this Section in accordance with manufacturer's printed instructions unless otherwise indicated.

C. Provide written or computer-generated documentation on the testing of the system including room by room description including:
   1. Sensor parameters, time delays, sensitivities and daylighting setpoints.
   2. Sequence of operation, (e.g., manual On, Auto Off. etc.).
   3. Load parameters (e.g., blink warning, etc.).

3.3 PRODUCT SUPPORT AND SERVICE

A. Factory telephone support must be available at no cost to the City of New York. Factory assistance must consist of solving programming or application questions concerning the control equipment.

END OF SECTION 26 09 43

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
1. Distribution panelboards.
2. Branch circuit panelboards.

B. Related Requirements:
1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
2. Section 26 05 53 - Identification for Electrical Systems.
3. Section 26 28 13 - Fuses.

1.3 REFERENCE STANDARDS

A. National Electrical Manufacturers Association (NEMA):
1. NEMA FU 1 - Low Voltage Cartridge Fuses.
2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
3. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
4. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
5. NEMA PB 1 - Panelboards.
6. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.

B. International Electrical Testing Association (NETA):
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. National Fire Protection Association (NFPA):
1. NFPA 70 - National Electrical Code.

D. Underwriters Laboratories Inc. (UL):
1. UL 50 - Cabinets and Boxes.
2. UL 67 - Safety for Panelboards.
3. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.
4. UL 1283 - Electromagnetic Interference Filters.
5. UL 1449 - Transient Voltage Surge Suppressors.

6. UL 1699 - Arc-Fault Circuit Interrupters.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit catalog data showing specified features of standard products.

C. Seismic Qualification: Submit certification that panelboards, overcurrent protective devices, accessories and components will withstand seismic forces. Indicate whether withstand certification is based on actual tests of assembled components or on calculations.

D. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

E. Source Quality control submittals: Indicate results of factory tests and inspections.

F. Field Quality Control Submittals: Indicate results of Contractor furnished tests and inspections.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.

B. Provide typed panelboard schedules for all panelboards. Schedules must be the final version after load balancing.

C. Operation and Maintenance Data: Submit spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Qualifications:
1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

1.7 WARRANTY

A. Furnish five-year manufacturer warranty for panelboard.

PART 2 - PRODUCTS

2.1 GENERAL

A. Dead-front panelboards incorporating the number, rating and type of circuit over-current protection indicated and as shown on the Contract Drawings must be provided in the enclosure specified for either surface or flush mounting as indicated on the Drawings.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Schneider Electric/Square D
   2. General Electric Company
   3. Siemens
   4. Eaton Corporation/Cutler-Hammer
   5. Or approved equal

2.3 DISTRIBUTION PANELBOARDS - CIRCUIT BREAKER TYPE

A. Description: NEMA PB 1, circuit breaker type distribution panelboard.

B. All interiors must be completely factory assembled with switching and protective devices, connectors, etc. They must be so designed that switching and protective devices can be replaced without disturbing adjacent units, without removing the main bus connectors, and must be so designed that circuits may be changed without machining, drilling or tapping.

C. Short Circuit Rating:
   1. For 208 and 480 volt panels - 100,000 amperes RMS symmetrical, or as indicated on drawings.

D. Materials:
   1. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings. Furnish isolated copper neutral bus in each 4-wire panelboard. Furnish copper ground bus in each panelboard.
   2. Multiple cable lugs for incoming feeder cables must be furnished where required. Lugs must be secured to bus by stud bolts. Multiple section panels must have sub-feed or feed-through lugs with full capacity taps to adjacent panel section.
   3. Molded Case Circuit Breakers: UL 489, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Furnish circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.
   4. Circuit breakers must be bolted in type, consisting of the number of poles and ampere ratings as noted on the drawings. Two and three pole breakers must be of the common trip type.
   5. Provide circuit breaker accessory trip units and auxiliary switches as indicated.
   6. All distribution panelboard circuit breakers must be equipped with lock-out/tag-out devices.
   7. Enclosure: NEMA PB 1, Type 1, 10-inches deep, 42-inches wide, cabinet box. Box must be fabricated from code gauge galvanized sheet steel without pre-punched knockouts.
   8. Cabinet Front: Door-in-door trim, bolted to the cabinet. Finish in manufacturer's standard gray enamel. Each door must be provided with Yale 511SEaton - Cutler Hammer 5155C81G01, Square D PK22FL Panel Lock or approved equal locks with 47 key. Locks must be provided as follows:
      a. For doors less than 30-inches – Provide one lock.
      b. For Doors 30 to 48-inches – Provide two locks.
      c. For doors greater than 48-inches – Provide three locks.

E. Finishes:
   1. Manufacturer's standard gray enamel.

F. Circuit Breaker Distribution Panelboards must be Schneider Electric/Square D I-Line, Eaton - Cutler Hammer, Atlas Switch Company Inc. or approved equal.

2.4 BRANCH CIRCUIT PANELBOARDS

A. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

B. All interiors must be completely factory assembled with switching and protective devices, connectors, etc. They must be so designed that switching and protective devices can be replaced without disturbing adjacent units, without removing the main bus connectors, and must be so designed that circuits may be changed without machining, drilling or tapping.

C. Short Circuit Rating:
1. For 240 and 480 volt panelboards - 65,000 amperes RMS symmetrical, or as indicated on drawings.

D. Materials:
1. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings. Furnish an insulated copper neutral bus in each panelboard with a neutral.
2. Furnish copper ground bus in each panelboard. Ground bus must be bare, un-insulated and suitably bolted to the cabinet. Provide suitable lugs for each feeder ground conductor and each outgoing branch or feeder circuit.
3. Multiple cable lugs for incoming feeder cables must be furnished where required. Lugs must be secured to bus by stud bolts. Multiple section panels must have sub-feed or feed-through lugs with full capacity tap to adjacent panel section.
4. Molded Case Circuit Breakers: UL 489, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, UL listed as Type SWD for lighting circuits; Type HACR for air conditioning equipment circuits; Class A ground fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers.
5. Enclosure: NEMA PB 1, Type 1.
6. Cabinet Box: 6-inches deep, 20-inch width unless otherwise noted. Box must be fabricated from code gauge galvanized sheet steel without pre-punched knockouts.
7. Cabinet Front: Door-in-door trim, bolted to the cabinet. Finish in manufacturer's standard gray enamel. Each door must be provided with Yale 511S, Eaton - Cutler Hammer 5155C81G01, Square D PK22FL Panel Lock or approved equal locks with 47 key. Locks must be provided as follows:
   a. For doors less than 30-inches – Provide one lock.
   b. For Doors 30 to 48-inches – Provide two locks.
   c. For doors greater than 48-inches – Provide three locks.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install panelboards in accordance with NEMA PB 1.1.

B. Install panelboards plumb.

C. Install recessed panelboards flush with wall finishes.

D. Height: 6-feet 6-inches to operating handle of highest circuit breaker. Install panelboards not less than 6-inches above the floor.

E. Install filler plates for unused spaces in panelboards.

F. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes to balance phase loads. Identify each circuit as to its clear, evident and specific purpose of use.

G. Install engraved plastic nameplates in accordance with Section 26 05 53.

H. Install spare conduits out of each recessed panelboard to accessible location above ceiling. Minimum spare conduits: 5 empty 1-inch. Identify each as spare.

I. Ground and bond panelboard enclosure according to Section 26 05 26. Connect equipment ground bars of panels in accordance with NFPA 70.

3.3 RESTORATION

A. Repair and clean existing panelboards to remain.

3.4 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.

C. Perform switch inspections and tests listed in NETA ATS, Section 7.5.

D. Perform controller inspections and tests listed in NETA ATS, Section 7.16.1.

3.5 ADJUSTING

A. Measure steady state load currents at each panelboard feeder; rearrange circuits in panelboard to balance phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

3.6 CLEANING

A. Clean existing panelboards to remain.

END OF SECTION 26 24 16

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SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:
1. Wall switches.
2. Receptacles.
3. GFI Receptacles.
4. Device plates.

B. Related Sections:
1. Section 26 05 33 - Raceway and Boxes for Electrical Systems.

1.3 REFERENCES

A. National Electrical Manufacturers Association (NEMA):
1. NEMA WD 1 - General Requirements for Wiring Devices.
2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

B. Underwriter's Laboratories, Inc. (UL):
1. UL 498 - Standard for Attachment Plugs and Receptacles.
2. UL 943 - Ground-Fault Circuit-Interrupters.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

B. Product Data: Submit manufacturer's catalog information showing dimensions, colors and configurations.

C. Samples: Submit two (2) samples of each wiring device and wall plate illustrating materials, construction, color and finish.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

1.7 WARRANTY

A. Furnish five-year manufacturer warranty for wall switches, receptacles, GFCI receptacles and device plates.

PART 2 - PRODUCTS

2.1 WALL SWITCHES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Cooper Wiring Devices by Eaton
   2. Hubbell
   3. Leviton
   4. Legrand/Pass & Seymour
   5. Or approved equal

B. Product Description: NEMA WD 1, Heavy-Duty (hard use), Specification grade, AC only general-use snap switch.

C. Body and Handle: Ivory plastic with toggle handle.

D. Ratings:
   1. Voltage: 120-277 volts, AC.
   2. Current: 20 amperes.

E. Single Pole Switch:
   1. Cooper No. CSB120
   2. Hubbell No. CSB120I
   3. Leviton No. CSB1-20I
   4. Legrand/Pass & Seymour No. CSB20AC1W
   5. Or approved equal

F. Double Pole Switch:
   1. Cooper No. CSB220
   2. Hubbell No. CSB220I
   3. Leviton No. CSB2-20I
   4. Legrand/Pass & Seymour No. CSB20AC2W
   5. Or approved equal

G. Three-Way Switch:
   1. Cooper No. CSB320
   2. Hubbell No. CSB320I
   3. Leviton No. CSB3-20I

4. Legrand/Pass & Seymour No. CSB20AC3W
5. Or approved equal

H. Four-Way Switch:
1. Cooper No. CSB420
2. Hubbell No. CSB420I
3. Leviton No. CSB4-20I
4. Or approved equal

2.2 RECEPTACLES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Cooper Wiring Devices by Eaton
2. Hubbell
3. Leviton
4. Legrand/Pass & Seymour
5. Or approved equal.

B. Product Description: NEMA WD 1, heavy-duty general use receptacle.

C. Device Body: Ivory plastic.

D. Configuration: NEMA WD 6.

E. Convenience Receptacle: NEMA Configuration 5-20.

F. GFCI Receptacle: Convenience receptacle with integral, self-testing ground fault circuit interrupter to meet regulatory requirements.

G. Duplex Convenience Receptacle:
1. Cooper Wiring Devices No. 5362
2. Hubbell No. 5362
3. Leviton No. 5362
4. Legrand/Pass & Seymour No. PS5362I
5. Or approved equal.

2.3 GFCI RECEPTACLES

A. Product Description: NEMA WD 1, heavy-duty general use receptacle, straight blade, feed-through device.

B. Device Body: Ivory plastic.

C. Configuration: NEMA WD 6.

D. Convenience Receptacle: NEMA Configuration 5-20.

E. GFCI Receptacle: Convenience receptacle with integral, self-testing UL Class A ground fault circuit interrupter to meet regulatory requirements.

F. Duplex GFCI Receptacle:
   1. Cooper Wiring Devices No. VGF20
   2. Hubbell No. GF20
   3. Leviton No. S7899
   4. Legrand/Pass & Seymour No. 2095
   5. Or approved equal

2.4 DEVICE PLATES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Cooper Wiring Devices by Eaton
   2. Hubbell
   3. Leviton
   4. Legrand/Pass & Seymour
   5. Or approved equal

B. Decorative Cover Plate: Brushed 302/304 stainless steel.

C. Jumbo Cover Plate: Brushed 302/304 stainless steel.

D. Weatherproof Cover Plate: In-use cover to allow cover to be closed with plug inserted into the receptacle.
   1. Hubbell
   2. Leviton
   3. Cooper
   4. Or approved equal

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements

3.2 EXAMINATION

A. Verify outlet boxes are installed at proper height.

B. Verify wall openings are neatly cut and completely covered by wall plates.

C. Verify branch circuit wiring installation is completed, tested and ready for connection to wiring devices.

3.3 PREPARATION

A. Clean debris from outlet boxes.

3.4 EXISTING WORK

A. Disconnect and remove abandoned wiring devices.

B. Modify installation to maintain access to existing wiring devices to remain active.

C. Clean and repair existing wiring devices to remain or to be reinstalled.

3.5 INSTALLATION

A. Install devices plumb and level.

B. Install switches with “Off” position down.

C. Connect wiring device grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.

D. Install wall plates on flush mounted switches, receptacles, and blank outlets.

E. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

F. Use jumbo size plates for outlets installed in masonry walls.

3.6 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 26 05 33 to obtain mounting heights as specified.

B. Install wall switch 48-inches above finished floor.

C. Install convenience receptacle 48-inches above finished floor.

3.7 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.

B. Operate each wall switch with circuit energized and verify proper operation.

C. Verify each receptacle device is energized.

D. Test each receptacle device for proper polarity.

E. Test each GFCI receptacle device for proper operation.

3.8 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.9 CLEANING

A. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION 26 27 26

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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. Fuses.

B. Related Sections:
   1. Section 26 28 19 - Enclosed Switches.

1.3 REFERENCE STANDARDS

A. National Electrical Manufacturers Association (NEMA):
   1. NEMA FU 1 - Low Voltage Cartridge Fuses.

B. Underwriter's Laboratories, Inc. (UL):
   1. UL 248-8 – Low-Voltage Fuses – Part 8: Class J Fuses.
   2. UL 248-10 – Low-Voltage Fuses – Part 10: Class L Fuses.
   3. UL 248-12 – Low-Voltage Fuses – Part 12: Class R Fuses.
   4. UL 248-14 – Low-Voltage Fuses – Part 14: Supplemental Fuses.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

B. Product Data: Submit data sheets showing electrical characteristics, including time-current curves.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual sizes, ratings, and locations of fuses.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements"

B. Qualifications:
   1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

1.7 WARRANTY

A. Furnish five-year manufacturer warranty for fuses.

PART 2 - PRODUCTS

2.1 FUSES - GENERAL

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Eaton - Bussmann
2. Mersen
3. Littelfuse
4. Or approved equal

B. Dimensions and Performance: NEMA FU 1, Class as specified or as indicated on Drawings.

C. All fuses must have an interrupting rating of 200,000 amperes RMS Symmetrical.

D. All fuses must be UL Listed.

E. All fuses utilized on the project must be products of one manufacturer.

F. Voltage: Rating suitable for circuit phase-to-phase voltage.

2.2 CLASS RK1 (TIME DELAY) FUSES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Bussmann Type LPN-RK (250V) or Type LPS-RK (600V)
2. Mersen A2D (250V) or A6D (600V)
3. Littelfuse Type LLN-RK (250V) or Type LLS-RK (600V)
4. Or approved equal

B. Description: Dual-Element, time-delay, current limiting, rejection type.

2.3 CLASS J (TIME DELAY) FUSES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Bussmann Type LPJ (600V)
2. Little fuse Type JTD (600V)
3. Mersen AJT (600V)
4. Or approved equal

B. Description: Dual element, time-delay fuse; current limiting.

2.4 CLASS L (TIME DELAY) FUSES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:

1. Bussmann Type KRP-C (600V)
2. Littelfuse Type KLP-C (600V)
3. Mersen A4BQ (600V)
4. Or approved equal

B. Description: Time-delay (minimum 4 sec at 500% of rating), current limiting, machined end bells with o-ring inlays, silver plated terminals.

2.5 CLASS CC (TIME DELAY) FUSES

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Bussmann Type LP-CC (600V)
2. Mersen ATDR (600V)
3. Littefuse Type KLDR (600V)
4. Or approved equal

B. Description: Time-delay fuse; rejection type.

2.6 SPARE FUSE CABINET

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Bussmann
2. Mersen
3. Littelfuse
4. Or approved equal

B. Product Description: Wall-mounted sheet metal cabinet with shelves, suitably sized to store spare fuses and fuse pullers specified.

C. Doors: Hinged with hasp for the Commissioner’s padlock.

D. Finish: Manufacturer’s standard baked enamel finish.

E. Furnish two fuse pullers in each spare fuse cabinet.

2.7 FUSE PERFORMANCE REQUIREMENTS

A. Feeder Switches Larger than 601 amperes: UL Class L (time-delay).

B. Feeder Switches less than 600 amperes: UL Class RK1 (time-delay).

C. Motor Load Feeder Switches: UL Class RK1 (time-delay).

D. General Purpose Branch Circuits: UL Class RK1 (time-delay).

E. Motor Branch Circuits: Class RK1 (time delay).

F. Lighting Branch Circuits: UL Class CC (time delay).

G. Motor Control Transformers: UL Class CC (time-delay).

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install fuse with label oriented so manufacturer, type and size are easily read.

B. Promptly replace all fuses cleared during construction for whatever cause.

3.3 FUSE TYPE

A. The type of fuses required for each application are given in the Specification Sections where equipment requiring fuses are specified.

B. If the fuse type is not identified, provide UL Class RK-1 fuses.

END OF SECTION 26 28 13

SECTION 26 28 19 - ENCLOSED SWITCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Fusible.
   2. Non-fusible switches.

B. Related Sections:
   1. Section 26 05 29 - Hangers and Supports for Electrical Systems.
   2. Section 26 05 53 - Identification for Electrical Systems.
   3. Section 26 28 13 - Fuses.

1.3 REFERENCE STANDARDS

A. National Electrical Manufacturers Association (NEMA):
   1. NEMA FU 1 - Low Voltage Cartridge Fuses.
   2. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).

B. International Electrical Testing Association (NETA):
   1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. Underwriter's Laboratory, Inc. (UL):
   1. UL-98 - Enclosed and Dead-Front Switches.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit switch ratings and enclosure dimensions.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of enclosed switches and ratings of installed fuses.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

1.8 WARRANTY

A. Furnish five-year manufacturer warranty for enclosed switches.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Allen-Bradley
   2. Eaton Corporation/Cutler-Hammer
   3. General Electric Company
   4. Schneider Electric/Square D
   5. Siemens
   6. Or approved equal

2.2 FUSIBLE SWITCH ASSEMBLIES

A. Product Description: NEMA KS 1, Type HD with externally operable handle interlocked to prevent opening front cover with switch in “On” position, enclosed load interrupter switch. Handle lockable in “Off” position.

B. Fuse Clips: Designed to accommodate only NEMA FU 1, Class R fuses. Rejection type fuse clips or rejection pins must be installed in all fusible switches.

C. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard enamel unless otherwise noted.
   1. Interior Dry Locations: NEMA Type 1.
   2. Exterior Locations: NEMA Type 3R.

D. Provide auxiliary contact in each switch for connection to variable speed drive control circuit.

E. Switches must be furnished with copper isolated neutral bus and copper ground bus in each switch.

F. Service Entrance: Switches identified for use as service equipment are to be labeled for this application. Provide neutral bonding provisions for service entrance rated switches.

G. Furnish switches with entirely copper current carrying parts.

2.3 NON-FUSIBLE SWITCH ASSEMBLIES

A. Product Description: NEMA KS 1, Type HD with externally operable handle interlocked to prevent opening front cover with switch in "On" position, enclosed load interrupter switch. Handle lockable in "Off" position.

B. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard enamel unless otherwise noted.
1. Interior Dry Locations: Type 1.
2. Exterior Locations: Type 3R.

C. Switches must be furnished with copper isolated neutral bus and copper ground bus in each switch.

D. Provide auxiliary contact in each switch for connection to variable speed drive control circuit.

E. Furnish switches with entirely copper current carrying parts.

2.4 SWITCH RATINGS

A. Switch Rating: Horsepower rated for AC or DC as indicated on Drawings.

B. Short Circuit Current Rating:
1. UL Class RK-1 fuses – 200,000 RMS symmetrical amperes.
2. UL Class J fuses – 200,000 RMS symmetrical amperes.
3. UL Class L fuses – 200,000 RMS symmetrical amperes.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Maintain access to existing enclosed switches and other installations remaining active and requiring access.

3.3 INSTALLATION

A. Install enclosed switches plumb. Provide supports in accordance with Section 26 05 29.

B. Height: 5 feet to operating handle.

C. Install fuses for fusible disconnect switches. Refer to Section 26 28 13 for product requirements.

D. Connect auxiliary contact to control circuit of variable speed drive to turn off drive when switch is opened.

E. Install engraved plastic nameplates in accordance with Section 26 05 53.

F. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

3.4 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4 – Division of Responsibility.

B. Perform inspections and tests listed in NETA ATS, Section 7.5.1.1 – Switches, Air, Low-Voltage.

3.5 CLEANING

A. Clean existing enclosed switches to remain.

END OF SECTION 26 28 19

SECTION 26 51 00 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
   1. Labor, materials and appurtenances required to complete the work of this Section, as specified herein, as required by job conditions, or as indicated on drawings.
   2. General requirements for lighting fixtures including coordination, definitions, quality assurances, submittals, mockups, samples and general responsibility for a complete job.

1.3 SCOPE

A. Furnish and install a luminaire of the type indicated by letter/number at each location shown on the drawings.

B. Furnish and install lamps for all luminaires furnished as part of this electrical Work.

C. All materials, accessories, components and any other equipment necessary for the complete and proper installation and operation of all luminaires, even those not usually indicated on the drawings nor specified but that are necessary for the proper installation and operation of the luminaires must be furnished by the Contractor.

D. Luminaires must be manufactured in strict accordance with the Contract Documents. The Contractor must be held responsible for the omission or absence of any detail, construction feature, etc. which may be required in the manufacture of the luminaires. The responsibility of accurately fabricating the luminaires to the fulfillment of this specification rests with the Contractor.

E. Specifications and scale drawings are intended to convey the main features, function and character of the luminaires only, and do not undertake to illustrate or set forth every item or detail necessary for the Work.

F. The Work must include all labor, tools, equipment, transportation, insurance, temporary protection, and miscellaneous items essential to the proper installation of the luminaires.

G. Contractor must provide itemized costs for all luminaires. Cost must include rough-in housing, trim, lamp, accessories and/or other components as described on the Lighting Fixture Schedule.

H. Study drawings for complete understanding of the intent and scope of the Work. Check and verify dimensions and details on Drawings before proceeding with the Work. Report any discrepancies at once to the Commissioner. Should it appear the Work intended to be described, or any of the matters relative thereto, are not sufficiently detailed or explained on the Drawings or in the Specifications, notify the

Commissioner for further drawings or explanations as may be necessary. Conform to these explanations in the Work. If any question arises about the true meaning of the Drawings or Specifications, refer the matter to the Commissioner whose decision is final and conclusive.

1.4 DEFINITIONS

A. The term "fixtures" refers to lighting fixtures and luminaires.

1.5 GENERAL REQUIREMENTS

A. Provide labor, materials, and equipment for the installation of indoor and outdoor lighting fixtures, lighting equipment, and lamps as shown on the drawings and specified here.

B. Refer to drawings for dimensions and details. Check and verify dimensions and details on drawings before proceeding with the work. Report any discrepancies at once to the Commissioner. Should it appear that the work intended is not sufficiently detailed or explained on the drawings or in the specifications, apply to the Commissioner for further drawings or explanations, as may be necessary. Conform to these explanations in the work. If any question arises about the true meaning of the drawings or specifications, refer the matter to the Commissioner whose decision is final and conclusive.

1.6 COORDINATION

A. Fixture locations as indicated on the electrical drawings are generalized and approximate. Carefully verify locations with the Architectural plans, reflected ceiling plans and other reference data prior to installation. Check for adequacy of headroom and non-interference with other equipment, such as ducts, pipes, openings, or insulation. Bring conflicts to the Commissioner’s attention before proceeding with the work.

B. Although the location of equipment included in the work of this Section may be shown on the Contract Drawings in a certain place, actual construction may disclose that the location for the work does not make its position easily and quickly accessible. In such cases, call the Commissioner’s attention to this situation before installing this work, and comply with the Commissioner’s installation instructions.

C. Clearly indicate the work to be performed by other trades, and the materials that are adjacent to or abutting the work of this Section. Coordinate as required.

D. Give ample notice of special openings required for placing equipment in the building, in order to avoid cutting of completed work.

E. Coordinate and schedule the work of this Section with the work of other Sections, so that there will be no delay in the proper installation and completion of any part of each respective work. Construction work must proceed in its natural sequence without unnecessary delay caused by the work of this Section.

F. Contractor must coordinate with other trades engaged in the construction of the project whose work might in any way affect the installation and must arrange the installation in proper relation to other work and with architectural finish so that it will harmonize in service and appearance and that there will be no interference with the work of others, including interference in location or level.

G. Schedule the work to prevent work of this Section being damaged by other construction operations. Remove and replace work so damaged at no cost to the City of New York.

H. Furnish the materials and labor for work included under this Section in ample time, and in sufficient quantities so that all of the work may be installed in proper sequence to avoid unnecessary cutting of the floors and walls.

I. Where work of this Section is to be flush or concealed, install it to assure that it does not project beyond the finished lines of floors, ceilings or walls, or beyond sightlines noted in drawings.

J. Verify ceiling conditions and furnish appropriate mounting details for each fixture. Such mounting details must be approved by the Commissioner.

K. Contractor for work of the Section must take responsibility to become familiarized with all equipment listed in the Lighting Fixture Schedule and must be responsible for the successful completion of the entire lighting installation.

L. Contractor of Work of this section must verify compatibility of supply voltage indicated on electrical drawings with voltage specified for each luminaire prior to release. Bring discrepancies to the Commissioner's attention.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Statement of Application:
   1. By commencing the work of this Section, the Contractor assumes overall responsibility, as a part of the guarantee of the work, to assure that assemblies, components and parts shown or required within the work of this Section, comply with the Contract Documents.
   2. Guarantee: The Contractor of the work in this section must:
      a. For a period of one year after Substantial Completion and establishment of the beginning date of the guarantee period, and at no additional cost, Contractor must promptly provide and install replacements for fixtures or components there of which, in the opinion of the Commissioner, are defective in materials or workmanship under normal operating conditions, except for lamps; or Contractor must repair installed equipment at the job site to the Commissioner's satisfaction. For any time during the guarantee period that fixtures are not fully functional due to defects in materials or workmanship, the Contractor must provide or pay for and install and remove suitable and adequate temporary lighting fixtures. Contractor also guaranties replacement fixtures or components to be free of defects in workmanship or materials for a period of one year following replacement, and must replace any defective replacements.

C. Equipment Compatibility:
   1. Provide similar fixtures and components fabricated by one manufacturer, to simplify maintenance and replacement of equipment.

D. Regulatory Agencies:
   1. Materials and installation must be in accordance with the latest revision of the National Electric Code and any applicable Federal, State, and local codes and regulations.
   2. Provided luminaires must conform to or exceed Underwriters Laboratories (UL) standards, and which conform to provisions of applicable codes which exceed those standards.

3. For any category of luminaire tested by any of the following agencies, provide luminaires that are listed and labeled by one of the following Nationally Recognized Testing Laboratories (NRTL) or approved by the City of New Work. Labels must be affixed to each luminaire in a position concealing it from normal view.
   a. Underwriters Laboratories (UL).
   b. Intertek (ETL).
   c. MET Electrical Testing Company (MET).
   d. Canadian Standards Association (CSA/US).
4. Provide luminaires which conform to additional regulations necessary to obtain approval for use of specified luminaires in locations shown. Use only electrical components approved by the City of New York.

E. Recognized Standards:
1. In addition to standards that may be referenced in the DDC General Conditions, luminaires must comply with the applicable standards of the following organizations:
   a. ANSI C78.379 – Electric Lamps – Incandescent and High-Intensity Discharge Reflector Lamps – Classification of Beam Patterns.
   b. ANSI/NFPA 70 – National Electric Code.
   c. ANSI/NFPA 101 – Life Safety Code.
   d. NEMA WD 6 – Wiring Device – Dimensional Requirements.
   e. ASHRAE/IESNA – Standard 90.1
   f. Underwriters Laboratories (UL).
   g. National Electrical Code (NEC).
   h. Certified Ballast Manufacturers Association (CBM).
   i. Illuminating Engineering Society (IES).
   j. IESNA LM-79-08 IESNA - Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products; 2008
   k. IESNA LM-80-08 IESNA - Approved Method for Measuring Lumen Maintenance of LED Light Sources
   l. IESNA TM-21-2011 – Projecting Long Term Lumen Maintenance of LED Light Sources
   m. UL 8750 – Light Emitting Diode (LED) Equipment for Use in Lighting Products
   n. OSHA 29CFR1910.7 – luminaires must be listed by national recognized testing laboratory approved by United Stated Department of Labor, Occupational Safety and Health Administration (OSHA
   o. American Society for Testing and Materials (ASTM).
   p. American National Standards Institute (ANSI).

1.8 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. General:
1. Fixtures or other materials must not be shipped, stored or installed into the work unless prior approval has been received, based upon the submittal of shop drawings, samples, catalogue cuts, test data, certificates or other material submitted for approval. Make modifications to fixtures in accordance with the Commissioner's comments concerning submittals, as a part of the work of this Section.

C. Shop Drawings:
   1. Submit shop drawings for each type of fixture, except where specified fixtures are standard, unmodified, "off-the-shelf" units, fully described by catalogue cuts.
   2. Shop drawings must show all luminaire components, including but not limited to lamp-holders, reflectors, louvers, lenses, fuses, junction boxes, ballasts and lamps. Shop drawings must show materials, finishes, metal gauges, overall and detailed dimensions, sizes, electrical and mechanical connections, fasteners, welds, joints, any exposed hardware, and conditions, or provisions for the work of others, and similar information. Indicate complete details of the luminaire, including manufacturer's name and catalogue numbers for sockets, ballasts, light shields, switches and type of wiring, and targeting and locking devices for adjustable luminaires. Indicate that lamp type specified is acceptable for luminaire design. Indicate type and extent of approved inert insulating materials to prevent electrolytic corrosion at junctions of dissimilar metals. Include pertinent mounting details including hung ceiling construction. No luminaires will be approved without the previous described submission of data. Submissions may be modified by the Commissioner before approval. Luminaires or other materials must not be fabricated, shipped, stored or installed unless prior written approval from the Commissioner has been received.
   3. Submit lamp/fixture layouts for continuous luminaires, fixture runs, or coves, indicating overall field measurements, proposed fixture lengths and all components required for a fully functional system.

D. Data: Submit independent laboratory photometric data in the directed number of copies and in format as directed by the Commissioner. Photometric data must be submitted for standard, "off-the-shelf" units, at the time the manufacturer's cuts are submitted. Photometric testing and reporting must conform to IES procedures.

E. Manufacturer's Catalogue Sheets must indicate input and load electrical characteristics, ambient temperature rating, noise level rating, mounting methods and U.L. listing for use with required lamp and ballast as applicable.

1.9 SAMPLES

A. After shop drawings, data and any other required submissions have been approved, submit to the Commissioner samples of each of the following components:
   1. Samples demonstrating the finishes of any custom metal, paint color or finish requested by the Commissioner. Sample size to be a minimum of 4 sq. inches.
   2. Material samples of any transmitting media, such as plastic, glass, perforated metal and the like. Sample size to be a minimum of six square inches.
   3. Any other luminaires or components requested in the luminaire descriptions or schedule.

B. Submit two (2) samples unless otherwise indicated. If luminaire samples are requested, supply a completely operable luminaire with the specified lamp and a 10'-0" cord and plug for standard 120 volt service. For 277 volt luminaires, also supply a completely wired or plug-wired step-up transformer to convert 277 to 120 volts. Provide component parts as specifically requested.

C. Where a sample is submitted or requested, do not fabricate that luminaire type until the sample is approved. Submit and resubmit a sample as required, until samples are approved.

D. Provide samples as called for in the General Conditions. Tag samples with the name of the project, referenced specification, paragraph or drawing number, the luminaire type number and any other

identifying data. Ship the samples to two separate addresses as specified by the Commissioner. After review, the samples must be shipped to the Commissioner at the project site for use as standards. All transportation charges for samples will be paid by the Contractor. Make luminaires supplied under the Work of this Section identical with approved samples. Do not install any sample luminaires in the project.

E. If sample submissions are not approved, samples must be returned to the Contractor, at Contractor's expense. Upon receipt of sample disapproval, immediately make a new submission of samples meeting the contract requirements, as called for in the General Requirements.

1.10 MOCK-UP

A. As a part of the work of this Section, where specifically called for in the Fixture Descriptions or Light Fixture Schedule, and at no additional cost to the City of New York, temporarily install, connect and adjust a reasonable number of fixtures, three (3) unless otherwise stated, of each type listed in the Fixture Descriptions or Lighting Fixture Schedule where a mock-up is specified, to verify specified requirements. Place the mock-up fixtures where and when directed by the Commissioner. Remove and store mock-up fixtures, when approved, as necessary to complete the work, at Contractor's expense.

B. Exposed finishes must be protected during manufacture, transport, storage and handling. Delivered materials must be identical to the approved samples. Materials which become damaged must be repaired and/or replaced as directed.

C. Fixtures must be stored under cover, above the ground, in clean, dry areas, and must be tagged and/or marked as to type and location.

D. Delivered fixtures must include wiring, sockets, ballasts, shielding, channels, lenses and other parts and appurtenances necessary for fixture installation of each fixture type.

1.11 WARRANTY

A. Luminaires, LEDs and labor must be under full warranty for a period of two (2) years from date of Substantial Completion.

B. Drivers and labor must be under full warranty for a period of two (2) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide materials, equipment, appurtenances and workmanship for the work of this Section conforming to the highest commercial standards, as specified and indicated on the drawings. Make fixture parts and components not specifically identified or indicated on the drawings, of materials most appropriate to their use or function, and resistant to corrosion and to thermal and mechanical stresses encountered in the normal application and function of the fixtures.

B. Provide recessed fixtures that are constructed to be suitable for and compatible with the ceiling, wall or pavement materials and construction in which they will be installed.

C. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
1. Eaton
2. Coronet
3. Zumtobel
4. Or approved equal

2.2 MARKING OF FIXTURES

A. Plainly mark fixtures equipped with ballasts for operation of rapid start lamps "Use Rapid Start Lamps Only." Similarly, mark other fixtures according to proper lamp type. Clearly mark ballasts that have multi-level outputs as such, and indicate proper terminals for the various outputs. Provide markings that are clear and that are located to be readily visible to service personnel, but invisible from normal viewing angles when lamps are in place.

2.3 MATERIALS AND FABRICATION

A. General Description: Provide fixtures, completely factory-assembled and wired and equipped with necessary sockets, ballasts, wiring, shielding, reflectors, channels, lenses and other parts and appurtenances necessary to complete the fixture installation and deliver to project site ready for installation.

B. Unless otherwise noted, use only completely concealed hardware. Weld exposed metal at joints, fill with weld material, grind smooth, and make free from light leaks by the inherent design of the fixture body and frame. Bond gaskets, when used, to the fixture metal. Gasket incandescent fixtures with overlapping trim. Weld ballast support studs, socket saddle studs and reflector support studs to fixture body. Self-threading screws are not approved. Make flexible leads enter fixtures at sides, unless otherwise noted. Ventilate ballast compartments and fixtures using bottom re-lamping, unless otherwise noted.

C. Minimum gauges sheet steel: 20 gauge unless otherwise specified.

D. Construct fixtures with the minimum number of joints. Make unexposed joints by approved method such as welding, brazing, screwing or bolting. Soldered joints are not acceptable. Do not use self-tapping methods or rivets for fastening parts which must be removed to gain access to electrical components requiring service or replacement, or for fastening any electrical components or their supports.

E. Provide metallic cast or extruded parts of fixtures that are close grained, sound, and free from imperfections or discolorations. Provide cast or extruded parts that are rigid, true to pattern, and of ample weight and thickness. Provide cast or extruded parts that are properly fitted, filed, ground, buffed and chased to provide finished surfaces and joints free of imperfections. Make thickness on cast parts not less than 1/8 inch.

F. Provide housings for fixtures that make electrical components easily accessible and replaceable, without removing the fixture body from its mounting.

G. Provide luminaires indicated as "continuous" on drawings or specifications with finished end-to-end or wall-to-wall appearance. Do not overlap single rows of fixtures, unless otherwise specified. Maximize

lighted length to nearest whole foot, with equally spaced unlighted portions at each end, not to exceed 6" each. Provide continuous louvers and/or lenses into unlighted ends and at corners.

2.4 FINISHES

A. Apply fixture finishes after fabrication in a manner that assures a durable wear-resistant surfacing. Prior to finishing, hot clean the surfaces by accepted chemical means, and treat them with corrosion inhibiting (phosphating) treatment to assure positive paint-adhesion. Give exposed metal surfaces (brass, bronze, aluminum and others) and finished castings accept chromium-plated or stainless steel parts an even coat of high grade methacrylate lacquer, or transparent epoxy. Anodize exposed aluminum surfaces for corrosion resistance. Make sheet steel fixture housing, and iron and steel parts which have not received phosphating treatment, or which are to be utilized in exterior applications corrosion resistant by zinc or cadmium plating or hot-dip zinc galvanizing after completion of all forming, welding, or drilling operations. Provide minimum thickness of protective coatings:

1. Hot galvanized zinc coating 0.0005 inch
2. Cadmium plating 0.00015 inch

B. Electroplate parts operated under temperatures injurious to hot-dipped galvanizing.

C. Cadmium plate screws, bolts, nuts and other fastening or latching hardware.

D. Except where otherwise indicated provide fixtures with a final synthetic, high-temperature baked enamel coating of color and finish as specified or directed. Unless otherwise specified, provide white baked enamel reflective surfaces, with a minimum reflectance of 86%. Unless otherwise specified, provide matte black non-reflective surfaces. Prior to painting, give all parts proper etched surface preparation to assure paint adherence and durability. See paragraphs above.

2.5 FIXTURE WIRING

A. Provide luminaire wiring between lamp-holders and associated operating and starting equipment in compliance with UL 1570 and NEC. (Provide wiring between fluorescent lamp-holders and associated operating and starting equipment of similar or heavier gauge than the leads furnished with the approved types of ballasts and having equal or better insulating and heat resisting characteristics. Provide internal wiring of fixtures containing a minimum number of splices. Make splices with approved mechanical insulated steel spring type connectors, suitable for the temperature and voltage conditions to which the splices are to be subjected.)

B. Make connections of wires to terminals of lamp-holders and other accessories in a neat and workmanlike manner and which are electrically and mechanically secure, with no loose strands protruding. Provide a number of wires extending to or from the terminals of a lamp-holder or other accessory that does not exceed the number which the accessory is designed to accommodate.

C. Provide proper contact force for oxide disruption to mitigate fretting at all electrical connections. Ensure use of proper electrical connectors based on wire size, type and coatings. Provide proper wiping of wire prior to final connection. Ensure maximum temperatures are not exceeded for all wiring and connections.

D. When allowed by local code, use of connectors meeting self-extinguishing UL 94 standards must prevent flaming particles from exiting fixture openings and/or make contact with combustible materials.

E. Provide wiring channels and wireways free from projections and rough or sharp edges throughout. At points or edges over which conductors must pass and may be subject to injury or wear, grind to make a smooth contact surface with the conductors.

F. Install insulated bushings at points of entrances and exit of flexible wiring.

2.6 SOLID STATE LIGHTING (LED)

A. General:
1. Performance and Design Requirements:
a. LED systems must include a luminaire, transformer/drivers as requires, wiring components, jacks compatible with project control system, to make a complete and functioning unit.
b. All LED luminaires must be photometrically tested. Photometric testing must be performed in accordance with IESNA LM-79-08.
c. LED chips supplied with luminaires must be tested in accordance with IENSA LM-80-08. Average rated life must be 70% of the initial lamp lumen output at 50,000 hours.
d. Life Estimation Test Method of all LED systems must be performed in accordance with IESNA TM-21 (Pending).
e. All LED circuit boards and electrical components must be RoHS Compliant (Restriction of Hazardous Substances).
f. Manufacturer to supply CQS (Color Quality Scale) measurements upon request.
g. Data interface (as required) must be as specified.
h. Color range for all “white” LEDs must not deviate more than ±200K. Where specified, color range for “white” LEDs must not deviate more than ±100K.
i. Where specified, LEDs must be binned with a minimum CRI (not an average).
j. Where specified, luminaires must be full range dimmable, smooth without flicker.
k. Individual LEDs must be connected such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire.
l. Shop drawings are required and must include life (hours) at 70% and 50% lumen maintenance with plot graph of measured and extrapolated data. Initial lumens for each LEDs color temperature must be listed individually.
m. Ambient temperatures surrounding the fixture must not exceed 120°F.
n. The thermal management (of the heat generated by the LEDs) must be of sufficient capacity to assure proper operation of the luminaire over the expected useful life.
o. Luminaires must be U.L. listed and labeled.
p. Fixture that are part of the wireless lighting control system must have integral wireless daylight sensor, motion sensor and 0-10V dimming.
2. Drivers:
a. Drivers must have reverse polarity protection, open circuit protection and require no minimum load.
b. Drivers must be a minimum of 85% efficient.
c. When specified in an outdoor location, drivers must be impervious to harsh environments, be waterproof and use plug and play connections.
d. Where specified, drivers must be 100%-10% dimmable, unless otherwise noted in the Light Fixture Schedule. Coordinate with lighting control system.
e. Sound rating A+.
f. Driver must operate with less than 5% flicker (maximum 0.20 Flicker index) for generated light at full output and all dimmed levels.

2.7 REFLECTORS

A. Aluminum Reflectors:
1. Provide reflectors and reflecting cones or baffles fabricated from #12 aluminum reflector sheet, 0.057 inch (15 gauge) or heavier; and absolutely free of tooling marks including spinning lines, and free of marks or indentation caused by riveting or other assembly techniques. No rivets, springs, or other hardware must be visible after installation.
2. Provide reflectors and baffles of first-quality polished, buffed and anodized finish, "Alzak" or approved equal, and with specular finish color as selected by the Commissioner. Provide reflector and baffles which produce neither apparent brightness from nadir to 45 degrees above nadir, nor a lamp image nor may any part of the lamp be visible from nadir to 45 degrees above nadir.
3. Provide other aluminum reflectors where required, and formed and finished as noted on drawings and elsewhere in the specifications. Provide only reflectors free from blemishes, scratches, or indentations which would distort their reflective function and finished by means of the "Alzak" process, or approved equal, unless otherwise noted. Techniques: no rivets, springs, or other hardware must be visible after installation.
4. Aluminum Reflector Characteristics:

Min. Weight of Coating Class (mg/in²)	Service	Min. Reflectivity Specular / Diffuse
MI 5.0	Normal interior	83% / 75%
SI 7.5	Medium interior, industrial, exterior when operating within glass, metal or plastic enclosure	82% / 73%
SE 10.0	Exterior, industrial or commercial, exposed to atmosphere. Marine service in enclosure	78% 65%

5. Provide reflectors, cones, or baffles for use with triphosphor fluorescent lamps with low iridescent coating on surfaces seen from normal viewing angles.

B. Painted Reflectors:
1. Provide painted reflectors completely formed before application of primer and enamel color coat or coats. Make reflectors and reflector bodies for fluorescent lamp fixtures, having baked-on white synthetic enamel finish, of steel, of the thickness specified or noted and given a suitable primer and white color coat or coats, applied to meet the following requirements and tests described below.
2. When requested by the Commissioner, submit a sufficient quantity of flat steel panels having the identical primer and color coat or coats applied in the same manners as proposed for the contract items, for subjection to any one or all of the tests listed herein by an approved independent testing laboratory. Provide panels of suitable size and drilled as necessary for a particular test procedure.
3. Tests will be required only in case of dispute about reflector characteristics. Tests may be required at any time before or during Contractor's guarantee period. Contractor will pay the cost of tests, if required. Reflectors which do not meet the criteria expressed here will be replaced at Contractor's expense, with reflectors meeting specified requirements.
4. Tests:
   a. Provide an initial reflection factor not less than 86%. After 100 hours exposure to a fade-o-meter, reflection factor may not be less than 86%, and finish can show no visible color change.

b. Specular Gloss, in accordance with ASTM Method D-523-T, Procedure A, may be a minimum of 80.
c. Exposure for 48 hours to either hydrogen sulfide or sulphur dioxide may cause no more than slight yellowing and no blistering.
d. A spot test with 5% potassium hydroxide at room temperature for four hours may show no effect other than a loss of not over 15% gloss.
e. Contact with 5% soda ash solution at room temperature for 24 hours may show no effect.
f. Exposure to 100% humidity at 100 degrees F., for 100 hours (Cook Box Test) may show no blistering or other effects.
g. Salt spray (20% sodium chloride) for 150 hours may cause no breakdown of film. Talbor Abrasion Test may show no more than 15 mgm. per 300 cycles, using CS-10 wheel.
h. Erickson Bump Test may show a minimum of 3 millimeters of penetration before cracking.
i. Sward Harness Test may show a minimum of 30.

2.8 LENSES / FACEPLATES / TRIM

A. Where plastic lenses are indicated, provide lenses of 100% virgin methyl methacrylate, unless otherwise indicated. Lens is to be strain-free, uniform in appearance, and destaticized.

B. Make lenses, louvers, or other light diffusing elements contained in frames removable, but positively held within the frames so that hinging or other motion of the frame will not cause the diffusing element to drop out.

C. Provide faceplates of incandescent recessed fixtures which open for access to the interior of the fixture, serve as a ceiling trim, and are positively held to the fixture body by adjustable means that permit the faceplate to be drawn up to the ceiling as tight as necessary to ensure complete contact of faceplate with ceiling surrounding the fixture.

2.9 EXIT SIGNS

A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with Building Code of the City of New York.

B. Internally Lighted Signs:
1. Lamps for AC Operation: LED, 70,000 hours minimum rated lamp life. Red LED type.
a. Individual LED modules must not be visible.

C. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
1. Battery: Sealed, maintenance-free, nickel-cadmium type.
2. Charger: Fully automatic, solid-state type with sealed transfer relay.
3. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
4. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
5. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.

6. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.
7. Individual LED modules must not be visible.

2.10 FIXTURE DESCRIPTIONS

A. Provide fixtures which conform to the above standards and criteria, as indicated on the drawings, and as indicated below. Contractor to verify ceiling conditions for all fixture types.

B. Catalogue or series numbers, when shown, are intended to provide assistance in establishing general type or category of lighting fixtures. These are not part of specification nor are they to be used to order fixtures. Contractor must provide a fixture that meets the complete performance descriptions below.

C. Standard catalogue cuts, when included, are for general assistance only, and are not a part of these specifications. Written fixture descriptions below are the basis for fixture specification.

D. Fixture Descriptions:
1. See Light Fixture Schedule on Electrical Drawing Sheet(s).

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

A. Install fixtures complete with lamps, as indicated, and with equipment, materials, parts, attachments, devices, hardware, hangers, cables, supports, channels, frames and brackets necessary to make a safe, complete, and fully operative installation.

B. Verify and provide fixtures that are appropriate for the ceiling and mounting conditions of the project.

C. Reject and do not install blemished damaged or unsatisfactory fixtures. Replace imperfect or unsatisfactory fixtures, if installed, as directed by the Commissioner.

D. Set fixtures, when installed, to be true, and free of light leaks, warps, dents, or other irregularities. No light leaks are permitted at the ceiling line or from any visible part or joint of the fixtures.

E. Provide finish for exposed parts or trims as specified so indicated, provide a finish as directed by the Commissioner.

F. Do not install reflector cones, aperture plates, lenses, diffusers, louvers, and decorative elements of fixtures until completion of wet work, plastering, painting and general clean-up in the area of the fixtures.

G. Mount fixtures at heights and locations indicated on the Contract Drawings, or as required by the Commissioner.

H. Adequately protect the housing of recessed lighting fixtures during installation by internal blocking or framing to prevent distortion of sides, or dislocation of threaded lugs, which, upon completion, must be in perfect alignment and match the corresponding holes in frames or rims. Holding screws must be inserted freely without forcing, and must remain easily removable for servicing. Threads intended to receive holding installation and removal of knurled headed screws.

I. Upon completion of the installation, the lighting fixtures and lighting equipment must be in first class operating order and free from defects in condition and finish. At time of final inspection, all fixtures and equipment must be clean, fully lamped, and be complete with required lenses or diffusers, reflectors, side panels, louvers, or other components necessary for the function of the fixtures. Any reflectors, lenses, diffusers, side panels or other parts damaged prior to the final inspection must be replaced by the Contractor prior to inspection.

3.3 ACCESSIBILITY

A. Install equipment such as junction and pull boxes, fixture housings, transformers, ballasts, switches and controls, and other apparatus that must be reached from time to time for operation and maintenance, to be easily accessible and appropriate for mounting and ceiling conditions.

3.4 SUPPORTS

A. Provide plaster frames or mounting frames for fixtures that require them. Such frames must be appropriate for the ceiling construction in which they will be installed.

B. Provide necessary hardware with fixtures, such as stems, plates, plaster frames, hangers and similar items, for safe support of the fixture. Provide plaster frames made of non-ferrous metal, or of steel that has been suitably rust proofed after fabrication, as described above.

C. Provide supports for fixtures that are adequate to support the weight of the fixtures.

D. Provide visible hanging devices that are finished to match the fixture finish, unless indicated otherwise.

E. Where necessary to meet fire resistance requirements, provide enclosures housing recessed fixtures that are constructed to provide required fire resistance rating.

F. Provide attachment devices including brackets, plastic or cast metal shapes with the requisite rigidity and strength to maintain continuous alignment of installed fixtures. Attach fixtures to ceiling supporting members, and do not depend upon lathing, plaster or ceiling tile for alignment or support.

G. Provide fixtures mounted in suspended ceilings that are supported by saddle hangers or the bars attached to runners or between crossbars of ceiling systems. Provide mounting splines or other positive means of maintaining alignment and rigidity.

H. Provide supporting members that are surface passivated, and which are primed or paint-dipped to resist corrosion.

I. Provide fastening devices of a positive locking type, which do not require special tools to apply or remove them. Do not use tie wires in place of fastening devices.

J. Contractor is responsible for the necessary suspension system; Contractor must ascertain the structural reliability of supports provided under other Sections of the specification.

K. Attach reflectors to housings by means of safety chains, which will prevent reflectors from falling. No part of the chain may be visible after installation, when viewed from any angle up to 45 degrees from the horizontal.

L. Provide pendant or surface mounted fixtures with required mounting devices and accessories, including hickeys, stud-extensions, ball aligners, canopies, and stems. Uniformly maintain the fixture heights shown on the Contract Drawings or established in the field. The allowable variant tolerance in mounting individual fixtures must not exceed 1/4 inch and may not vary more than 1/2 inch from the floor mounting height shown on the drawings. Install fixtures hung in continuous runs absolutely level, and in line with each other. Hanging devices must comply with code requirements.

M. Provide hanging devices which, if visible from normal viewing angles, exactly match fixture finishes.

N. Provide an approved ceiling canopy for each stem, exactly matching fixture finishes.

O. Place stems to be plumb vertical.

P. Provide at least two supports for individually mounted fixtures. Where fixtures are ganged, provide supports at least at 8 ft. intervals, unless otherwise indicated.

3.5 ADJUSTMENT

A. Provide manpower and tools for final focusing and adjustment, under the Commissioner's supervision, of all adjustable fixtures after regular working hours, whenever necessary, at no additional cost to the City of New York.

3.6 DISPOSAL

A. All ballasts/drivers containing PCB's and batteries must be treated as hazardous waste and be disposed of as regulated by the Environmental Protection Agency's Universal Waste Rule. Any state regulations more stringent will take precedence.

3.7 CLEANING

A. Immediately prior to occupancy, clean reflector cones, reflectors, aperture plates, lenses, louvers, lamps and decorative elements. Destaticize lenses after cleaning, installing them to leave no finger or dirt marks.

B. Upon completion of the fixture installation and at the time of final inspection, fixtures must be clean, and free from marks, dust, spotting or other defects. Replace any broken or defective parts prior to final inspection. Replace or make good all defects revealed by final inspection.

3.8 MAINTENANCE MANUALS

A. The Contractor must be responsible for obtaining from supplying lighting manufacturers, for each type of luminaire, a recommended maintenance manual including tools required, types of cleaners to be used,

replacement parts identification lists and final, as built shop drawings, warranty information. These manuals must be produced and delivered to the Commissioner as specified in DDC General Conditions.

END OF SECTION 26 51 00

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SECTION 26 52 00 - SAFETY LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes requirements for wiring devices in accordance with the Contract Documents. The work of this Section will include, but not limited to, the following:
   1. Battery unit with integral beam lights.
   2. Exit signs.

B. Related Sections:
   1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
   2. Section 26 05 33 - Raceway and Boxes for Electrical Systems.

1.3 REFERENCES

A. National Electrical Manufacturers Association:
   1. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit dimensions, ratings, and performance data.

C. Samples: Submit sample of emergency power inverter inside custom enclosure.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

1.6 WARRANTY

A. Furnish five-year manufacturer warranty for lighting.

PART 2 - PRODUCTS

2.1 BATTERY UNITS WITH INTEGRAL BEAM LAMPS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Cooper
   2. Eaton
   3. Lithonia
   4. Or approved equal

B. Product Description: Normally-off weatherproof LED emergency lighting unit. Lighting fixture must turn-on only when normal AC power is lost. Beam lamps must be fully adjustable swivel.

C. Battery: Integral sealed nickel-cadmium type, with 90 minutes capacity minimum

D. Accessories:
   1. Provide wire guard at each unit.

2.2 EXIT SIGNS

A. Manufacturers: Subject to compliance with requirement, provide products by one of the following:
   1. Cooper
   2. Eaton
   3. Lithonia
   4. Or approved equal

B. Product Description: NYC compliant exit sign fixture with integral battery unit capable of providing 90 minutes of constant power to fixture.

C. Housing: Die-cast aluminum.

D. Face: Aluminum stencil face with 8-inch red letters.

E. Directional Arrows: Universal type for field adjustment.

F. Battery: Integral sealed nickel-cadmium type, with 90 minutes capacity minimum.

G. Lamps: LED, 5 W per side, maximum.

H. Accessories:
   1. Provide wire guard at each exit sign. Wire guard must be suitable for use for its fixture type per manufacturer’s recommendation.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXISTING WORK

A. Disconnect and remove abandoned emergency lighting units, exit signs, lamps, and accessories.

B. Extend existing emergency lighting and exit sign installations using materials and methods compatible with existing installations, or as specified.

C. Clean and repair existing emergency lighting units and exit signs remaining or are to be reinstalled.

3.3 INSTALLATION

A. Provide luminaires at locations and of types as indicated on the Contract Drawings.

B. Install surface-mounted emergency lighting units and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.

C. Install wall-mounted emergency lighting units and exit signs at 8 feet to bottom of fixture.

D. Install accessories furnished with each emergency lighting unit and exit sign.

E. Connect emergency lighting units and exit signs to existing branch circuit outlets and new circuits as required.

F. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within unit.

G. Ground and bond emergency lighting units and exit signs to branch circuit equipment grounding conductor.

H. The Contractor must be responsible for the proper and safe mounting and support of all lighting fixtures. Installation must meet all the requirements of the New York City Electrical Code. Provide all items of equipment (stems, hangers, rods, inserts, boxes, brackets, yokes, channels, frames, etc.) required to adequately and safely support each lighting fixture in a manner acceptable to the Commissioner.

3.4 FIELD QUALITY CONTROL

A. Operate each unit after installation and connection. Inspect for proper connection and operation.

3.5 ADJUSTING

A. Aim and adjust lamp fixtures.

B. Position exit sign directional arrows as indicated on Drawings.

END OF SECTION 26 52 00

SECTION 28 31 00 - FIRE DETECTION AND ALARM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. The work covered by this Section of the Specification will include all labor, materials and services to furnish and install a completely new fire alarm system to be installed while the existing system remains functional.

B. Section Includes:
   1. Equipment:
      a. Fire Alarm Control Unit (FACU)
      b. Digital Alarm Communicator Transmitter (DACT)
      c. Dual-path Cel/IP Communicator (DPC)
      d. Initiating Devices:
         1) Manual Pull Stations
         2) Area Smoke Detector
         3) Duct Smoke Detector
         4) Heat Detectors
         5) Carbon Monoxide Detectors with Sounder Bases
         6) Individually Addressable Monitor Modules (MM)
      e. Control Devices:
         1) Individually Addressable Control Module (CM)
         2) Multi-Voltage Relays
      f. Notification Appliances:
         1) Fire Signal Horns
         2) Fire Signal Strobes
         3) Fire Signal Horns/ Strobes
      g. Fire Alarm Remote Annunciator (FARA)
      h. Fire Alarm Fused Disconnect Switch
      i. Fire Alarm Fused Cut-Out Panel (FCO)
      j. Uninterruptible Power Supply (UPS)
      k. Backup Battery
   2. Wire and Cable.
   3. All NYC Fire Alarm peripherals, such as riser diagram, necessary switches, LED’s, clock, and FDNY approved locks must be included in the system price.

C. Related Sections:
   1. Section 02 41 13 - Selective Demolition
   2. Section 07 84 00 - Firestopping: Thermal and Moisture Protection

3. Section 26 05 00 - Common Work Results for Electrical
4. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables
5. Section 26 05 26 - Grounding and Bonding for Electrical Systems
6. Section 26 05 29 - Hangers and Supports for Electrical Systems
7. Section 26 05 33 - Raceway and Boxes for Electrical Systems
8. Section 26 05 53 - Identification for Electrical Systems
9. Section 26 27 26 - Wiring Devices
10. Section 26 28 13 - Fuses
11. Section 26 28 19 - Enclosed Switches

1.3 APPLICABLE CODES AND STANDARDS

A. 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.

B. New York City:
1. NYCBC – 2014 New York City Building Code
2. NYCEC – 2011 New York City Electrical Code
3. NYCFC – 2014 New York City Fire Code
4. New York City Rules and Regulations
5. Requirements of the New York City Department of Building and the Fire Department of New York (FDNY) must be complied with to file, inspect and obtain a FDNY Letter of Approval for the Fire Alarm System.

C. National Fire Protection Association (NFPA):
1. NFPA 70 - The National Electrical Code
2. NFPA 72 - 2010 National Fire Alarm and Signaling Code as modified for use in NYC - See Appendix Q of the NYC Building Code.

D. Underwriters' Laboratories, Inc. (UL) equipment standards, Latest Edition:
1. UL 38 - Manually Activated Signaling Boxes
2. UL 217 - Smoke Detectors Single Station
3. UL 228 - Door Holders for Fire Protective Signaling Systems
4. UL 268 - Smoke Detectors for Fire Protective Signaling Systems
5. UL 268A - Smoke Detectors for Duct Applications
6. UL 464 - Audible Signaling Appliances
7. UL 497A - Secondary Protectors for Communications Circuits
8. UL 521 - Heat Detectors for Fire Protective Signaling Systems
9. UL 864 - Control Units and Accessories for Fire Alarm Systems
10. UL 1481 - Power Supplies for Fire Protective Signaling Systems
11. UL 1638 - Visual Signaling Appliances
12. UL 1971 - Standard for Signaling Devices for the Hearing Impaired
13. UL 2034 - Single and Multiple Station Carbon Monoxide Alarms
14. UL 2075 - Safety Gas and Vapor Detectors and Sensors

1.4 DEFINITIONS

A. ASME: American Society of Mechanical Engineers.

B. FACU: Fire alarm control unit.

C. FM: Factory Mutual Global (Factory Mutual).

D. LED: Light-emitting diode.

E. NICET: National Institute for Certification in Engineering Technologies.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

B. Product Data: For each type of product indicated, include construction details, material descriptions, dimensions of individual components and profiles, and finishes. Include rated capacities, operating characteristics, electrical characteristics, furnished specialties and accessories. Complete manufacturer’s catalog data including supervisory power usage, alarm power usage, physical dimensions finish and mounting requirements.

C. Power Calculations:
1. Backup battery capacity calculations with the stand-by and alarm power requirements for all equipment.
2. All system’s power supplies rating and connected equipment load.
3. Voltage drop calculations for wiring runs demonstrating worst-case condition.

D. Shop Drawings: Include plans, elevations, sections, details and attachments to other work.
1. Complete drawings covering the following must be submitted by the contractor for the proposed system:
   a. Floor plans in a CAD compatible format at a scale of 1/8”=1’-0” showing all equipment and raceways, marked for size, conductor count with type and size, showing the percentage of allowable NYC Electric Code fill used.
   b. Provide riser diagram showing all equipment and wiring on each floor.
   c. Provide a fire alarm system function matrix as referenced by NFPA 72, Figure A-7-5.2.2 (9). Matrix must illustrate alarm input/out events in association with initiation devices. Matrix summary must include system supervisory and trouble output functions.
   d. Provide panel interior drawings, showing the interior of each panel, interconnecting wiring and wiring from field devices.
   e. Provide details of equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Installation shop drawings, and as-built shop drawings must be prepared by an individual qualified for the work specified herein.

E. Submit manufacturer’s requirements for testing Device Loop Card circuits and device addresses prior to connecting to control unit. At a minimum, the following tests must be required: device address, the usage

(Alarm, Supervisory, etc.), environmental compensation, temperature ratings for thermal detectors and smoke detector sensitivities. This requirement must need approval before any wiring is connected to the control unit.

F. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other:
   1. Light fixtures.
   2. HVAC registers.

G. Qualification Data: For qualified Installer, Applicator, manufacturer, fabricator, professional engineer, testing agency, and factory-authorized service representative.

H. Warranty: Sample of special warranty.

I. Incomplete submittals will be returned without review, unless with prior approval of the Commissioner.

1.6 CLOSEOUT SUBMITTALS

A. Submit the following for the new system:
   1. NYC Fire Department Final Letter of Approval - The Original Letter and four (4) hard copies.
   2. Instructional video DVD or MP4/AVI file.
   3. Fire alarm system point lists in CSV/XLS file format.
   4. Vendor's Test Report – Four (4) hard copies, and one (1) electronic copy in PDF format.
   5. Warranties signed by manufacturer and installer.
   6. As-built shop drawings must consist of the complete revision of all previously submitted drawings with point-to-point depiction of all device wiring on the device layout floor plans. Approved signed and sealed fire alarm system as-built shop drawings must be provided as follows:
      a. One (1) set of B-size, laminated as-built drawings.
      b. Three (3) CDs of 24" x 36" drawings in PDF format and CAD

B. Contractor must turn over hard and soft copies of the Fire Alarm System's software and programming database upon final approval of FDNY to the Commissioner. The database provided must be useable by any authorized and certified distributor of the product line, and must include all applicable passwords necessary for total and unrestricted use and modification of the database. The City of New York must retain complete rights and ownership to all software running the Fire Alarm System. The turnover of all database information must occur prior to the end of the warranty period. Provide a copy of the revised program if it is modified during the warranty period.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

1.8 QUALIFICATIONS

A. Supplier Qualifications:
   1. Provide the services of a Professional Engineer licensed in the State of New York.

2. The Professional Engineer must supervise installation, software documentation, adjustment, preliminary testing, final testing and certification of the system. The Professional Engineer must instruct the City of New York's personnel in the system operation and maintenance.
3. The equipment supplier must be authorized and instructed by the manufacturer to calculate, design, install, test and maintain the fire alarm system and must be able to produce a certificate stating such upon request.

B. Installer Qualifications:
1. Before commencing work, submit data showing that the manufacturer has successfully installed fire alarm systems of the same scope, type and design as specified.
2. The Contractor must employ on staff a minimum of two (2) NICET Level II fire alarm technician or Professional Engineer licensed in the State of New York.
3. The Contractor must be qualified by UL for certifying fire alarm systems. Upon completion of the installation, the Contractor must certify the final system meets UL ongoing maintenance.

C. Testing Agency Qualifications: Qualified for testing indicated.

D. Source Limitations for fire alarm equipment: Obtain fire alarm equipment from single supplier.

E. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 50 or less.
3. Combustion Characteristics: ASTM E 136.

F. 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.

G. Pre-installation Conference: Conduct conference at Project site.

1.9 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 kept dry and protected from physical damage until ready for use. Remove from site and discard wet or damaged materials.

1.10 PROJECT CONDITIONS

A. Installed products or materials must be free from any damage including, but not limited to, physical insult, dirt and debris, moisture and mold damage.

B. Environmental Limitations: Do not deliver or install products or materials until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire alarm equipment that fail(s) in materials or workmanship within specified warranty period.
   1. Warranty Period: 2 years from date of Substantial Completion.

1.12 SOFTWARE

A. Technical Support: Beginning with Substantial Completion, provide software support for one (1) year.

B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within one (1) year from date of Substantial Completion. Upgrading software must include operating system. Upgrade must include new or revised licenses for use of software.
   1. Provide 30 days' notice to the City of New York to allow scheduling and access to the system and to allow the City of New York to upgrade computer equipment if necessary.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Fire Alarm System:
   1. Addressable Fire Alarm System Featuring Manual Alarm; Selective and Partial Smoke Detection; Heat Detection; Carbon Monoxide Detection and Central Office Communication.

B. The system must be a complete, electrically supervised fire detection and notification system, with a microprocessor-based operating system having the following capabilities, features and capacities:
   1. System must provide an output port for monitoring purposes by external systems.
   2. The local system must provide status indicators and control switches for all of the following functions:
      a. Audible and visual notification alarm circuit zone control.
      b. Any additional status or control functions as indicated on the drawings.
   3. Each addressable device or conventional zone on the system must be displayed at the Central Supervising Station and the local fire alarm control unit by a unique alphanumeric label identifying its location.

2.2 SYSTEM PERFORMANCE

A. General Performance: Comply with NFPA 72 and all contract documents and specification requirements.

B. All interconnections between this system and the monitoring system must be arranged so that the entire system can be UL-Certified.

C. The system must operate in the alarm mode upon actuation of any alarm initiating device. The system must remain in the alarm mode until all alarm initiating device(s) are reset and the fire alarm control unit is manually reset and restored to normal.

D. The system must provide the following functions and operating features:

1. The FACU and auxiliary panels must provide power, annunciation, supervision and control for the system.
2. Circuiting Guidelines:
   a. Signaling Line Circuits (SLC): No more than sixty (60) intelligent devices must be connected to one Class "B" circuit regardless of the circuit capacity. Class "A" wiring must be provided with circuit fault isolator modules every ten (10) addressable devices so that no more than ten (10) devices are lost to a wiring fault. Each DGP must include an SLC loop on a per floor basis. T-Tapping a SLC loop to cover an alternate floor must not be accepted.
   b. Notification Appliance Circuits (NAC): Circuits must have Class B operation. Each of the following types of alarm notification appliances must be circuited as shown on the drawings but will be typically as follows:
      1) Audible Signals: Provide sufficient spare capacity to assure that the addition of five (5) audible devices can be supported without the need for additional control components (power supplies, signal circuit modules, amplifiers, batteries, etc.).
      2) Visual Signals: Provide sufficient spare capacity to assure that the addition of three (3) visual devices can be supported without the need for additional control components (power supplies, signal circuit modules, batteries, etc.
   c. Where it is necessary to interface conventional initiating devices, provide addressable monitor modules to supervise Class B zone wiring.
   d. Each equipment associated with the fire alarm system must be provided with a multi-voltage relay as indicated on the drawings.
   e. Provide a dedicated 24VDC circuit to feed all multi-voltage relays required. Circuits must be supervised via an end-of-line relay and addressable monitor module. Multi-voltage relays must not derive their power from the starter or load being controlled.
   f. In no case must any fire alarm circuit be sized beyond 75% of circuit capacity.
3. Strobes must be synchronized throughout the entire building.
4. Provide electrical supervision of the primary power (AC) supply, presence of the battery, battery voltage, and placement of system modules within the control unit.

E. Batteries of system power supplies must be sized to provide 24 hours of standby operation in the supervision mode, with 15 minutes of full general evacuation operation of all notification appliances at the end of the 24-hour standby. Battery size must be a minimum of 125% of the calculated requirement.

F. Alarms, supervisory signals and trouble signals must be logged into the system's history during the walk-test.

G. Alarm functions must override trouble or supervisory functions. Supervisory functions must override trouble functions.

H. Fire alarm signal initiation must be by one or more of the alarm initiating device per sequence of operation matrix.

I. Activation of any system alarm, supervisory, trouble, or status initiating device must cause the following actions and indications at the fire alarm control unit and remote annunciators:
   1. Fire Alarm Condition:
      a. Sound an audible alarm and display a custom screen/message defining the specific alarm point initiating the alarm at the fire alarm control unit and remote annunciator.
      b. Log into the system history archives all activity pertaining to the alarm condition.

c. Sound the ANSI 117-1 signal with synchronized audibles and synchronized strobes throughout the facility.
d. Audible signals must be silenced from the fire alarm control unit by an alarm silence switch. Visual signals must be programmable to flash until system reset or alarm silencing, as required.
e. Send the event information to the central supervising station with the device type and custom message.
f. Refer to fire alarm sequence of operation matrix and notes shown on the fire alarm drawings for more information.

2. Additional system operation for fire alarm condition:
   a. Audible signals must be silenced from the fire alarm control unit by an alarm silence switch. Visual signals must be programmed to flash until system reset or alarm silencing, as required by the New York City Fire Department.
3. Supervisory Condition:
   a. Display the origin of the supervisory condition report at the fire alarm control unit and remote annunciator.
   b. Activate supervisory audible and dedicated visual signal.
   c. Audible signals must be silenced from the control unit by the supervisory acknowledge switch.
   d. Record within system history the initiating device and time of occurrence of the event.
   e. Send the event information to the central supervising station with the device type and custom message.
4. Trouble Condition:
   a. Display at the fire alarm control unit and remote annunciator, the origin of the trouble condition report.
   b. Activate trouble audible and visual signals at the fire alarm control unit and remote annunciator.
   c. Audible signals must be silenced from the fire alarm control unit by a trouble acknowledge switch.
   d. Trouble conditions that have been restored to normal must be automatically removed from the trouble display queue and not require operator intervention. This feature must be software selectable and must not preclude the logging of trouble events to the historical file.
   e. Trouble reports for primary system power failure to the master control must be automatically delayed for a period of time equal to 25% of the system standby battery capacity to eliminate spurious reports as a result of power fluctuations.
   f. Record within system history, the occurrence of the event, the time of occurrence and the device initiating the event.
   g. Send the event information to the central supervising station with the device type and custom message.

2.3 MANUFACTURERS

A. The following manufacturer is approved for the furnishing of the specified items of the fire alarm system equipment:
   1. Edwards System Technology EST (UTCFS)
      a. No Substitutions Permitted.

B. Each item of equipment offered by this manufacturers must meet the full requirements of the Specification for that item, and must be UL listed in accordance with UL 864 – 9th Edition and listed in the UL Fire

Protection Equipment Directory under product category "Control Units System (UOJZ)". Use of equipment listed under UL 864 - 8th Edition or earlier is not permitted.

2.4 EQUIPMENT

A. The following equipment, where shown on the Drawings or called for in the Specifications, must be furnished and installed by the Contractor at locations where shown on the Drawings, called for in the Specifications or as otherwise directed in writing by the New York City Fire Department:

1. Fire Alarm Control Unit (FACU):
   a. The fire alarm control unit must contain a microprocessor based Central Processing Unit (CPU). The CPU must communicate with and control the following types of equipment used to make up the system: detectors, manual pull stations, addressable modules, control circuits, notification appliance circuits, printers, annunciators, and other system-controlled devices.
   b. The Fire Alarm Control Unit must have a valid NYC Fire Department Certificate of Approval (COA) based on UL 864 – 9th Edition. Contractor must provide proof of valid COA.
   c. Fire Alarm Control Unit must be EST (UTCFS) model EST3X.
2. System Power Supply:
   a. The system power supply must operate on 120 VAC main power. This power must be transformer converted to low voltage providing rectified and filtered 24 VDC for system operation. This 24 VDC must be rated @ 4 Amps and must comply with U.L. Standard 864 9th Edition for power limited operation.
   b. The power supply must provide power for all system and auxiliary control functions, including the charging of the back-up batteries.
   c. The charger output must be supervised and fused.
   d. The battery charger must be capable of charging nickel-cadmium (Ni-Cad) or lead acid batteries.
   e. System power supply must be by EST (UTCFS).
3. Microprocessor Module:
   a. The microprocessor module must contain the microprocessor, memory, system operating software, configuration memory and the circuits necessary to support the fire control system.
   b. The microprocessor module must function as the system's information and control center, processing all messages from the field devices (supervisory, trouble, alarm).
   c. Microprocessor Functions:
      1) The microprocessor must execute all supervisory programming to detect and report the failure or disconnection of any module or peripheral device. An isolated circuit must be incorporated, which will monitor the microprocessor, if a failure were to occur, this circuitry would provide audible and visual indication of this abnormal condition.
      2) The microprocessor must access the system program for all control-by-event (CBE) functions. No system memory must be lost due to failure of the primary and secondary power. Volatile memory will not be acceptable.
      3) All job specific system programming, as to device monitoring and control functions, must be field programmable.
   d. Real-Time Clock:
      1) The microprocessor module must have a real-time clock capable of monitoring all real-time programming and all time control functions.
4. Display & Switch Module:
   a. These modules must provide display, annunciation and control for the complete Fire Alarm Control System.

b. An alphanumeric, true English, display must be an integral part of the module. This display must be back - lighted for ease of reading in the dark or bright ambient light conditions.
c. The Module must provide a keypad permitting selection of system functions. Also incorporated with the keypad must be three (3) control keys: Alarm/Trouble Acknowledge, Reset and Alarm Silence.

5. Signaling Line Circuits (SLC):
   a. A signaling line circuit module must be provided for communications with all addressable devices (initiation/control) connected to the system.
   b. The SLC module must provide power and communicate with all addressable devices on a single pair of wires.
   c. Each SLC module must contain at least one loop capable of communicating with a minimum of 125 addressable detectors and 125 addressable modules.
   d. Each system must be capable of monitoring multiple SLC modules.
   e. Each SLC loop must be isolated and equipped to annunciate and earth fault condition.
   f. The SLC loop must be capable of being wired either Class "A", a ground fault on either conductor or a break must not prevent a device from operating on either side of the break, or Class "B".
   g. Each SLC loop must be electrically supervised for opens, shorts, and ground fault conditions.
   h. The SLC module must include software to automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors, including the accumulation of dust in each detector. The detector's analog information may also be used for automatic detector testing and the automatic determination of detector maintenance requirements.
6. Notification Appliance Circuits (NAC):
   a. Provide a notification appliance circuit module to power and supervise the audible and visual notification appliance circuit wiring for open conditions, grounds and shorts.
   b. Field - located modules must be housed in Transponders or other approved enclosures.
   c. The use of control modules for signal circuits will not be accepted.
7. Coder Module:
   a. The coder module, if provided, must be solid state located at the fire alarm control unit. The coder must be 100% field programmable for a "Temporal 3" code, as described elsewhere in the specifications.
   b. For modification of the existing fire alarm panels required to add Carbon Monoxide detection, coder module must be capable of providing continuous operation of "Temporal 4" code (4-4-4-4…) until silenced at the fire alarm panel, to indicate CO detection.
8. Digital Alarm Communicator Transmitter (DACT):
   a. A DACT must be installed to transmit signals to a NYC Fire Department approved Central Supervising Station.
   b. The DACT must be integral to the fire alarm control unit. The DACT must be compact in size and mounted in a standard module position of the fire alarm control cabinet.
   c. The DACT must include connections for dual telephone lines (with voltage detect), per UL/NFPA/FACU requirements. It must include the ability for split reporting of panel events up to three different telephone numbers.
   d. Communication must include vital system status such as:
      1) Independent Zone (Alarm, trouble, non-alarm, supervisory)
      2) Independent Addressable Device Status
      3) AC (Mains) Power Loss
      4) Low Battery and Earth Fault

5) System Off Normal
6) 12 and 24 Hour Test Signal
7) Abnormal Test Signal (per UL requirements)
8) EIA-485 Communications Failure
9) Phone Line Failure

e. The DACT must support independent zone/point reporting using Contact ID format. In this format, the DACT must support transmission of up to 2,040 points. This enables the central station to have exact details concerning the origin of the fire or response emergency.

f. The system must be capable of a minimum capacity of 160 addressable smoke detectors, 160 addressable control modules and additional capacities for full point annunciation without decreasing the aforementioned capacities.

g. The DACT must be labeled to indicate the central supervising station.

9. Dual-Path Cel/IP Communicator (DPC):
   a. Contractor must provide a dual-path Cel/IP alarm communicator to interface to the DACT and allow the fire alarm system transmit signals to the central supervising station using internet and cellular communication as primary and secondary transmission means, respectively. All required components such as antennas and cables must be provided.
   b. The DPC must have a valid NYC Fire Department Certificate of Approval (COA) based on UL 864 – 9th Edition. Contractor must provide proof of valid COA.
   c. The DPC must be powered directly from the fire alarm control unit. The fire alarm system battery capacity must include the DPC operating power requirements.
10. Initiating Devices:
   a. Manual Pull Stations:
      1) Each pull station must be addressable manual pull lever single-action type. When operated, the handle must be locked in the operated position until the station is reset (by use of either a key or a reset tool, depending on model).
      2) Each pull station must have hinged inner and outer doors with the inner door locked. A common key must be required to gain access for resetting the station. Instructions for operating station must appear on front of the outer door.
      3) The pull station must be interfaced into the addressable system by means of an internal or external addressable interface module. Pull stations with internal or external addressable interface module must be UL listed for use with the FACU.
      4) For surface or semi-flush mounting, the mechanism must be set into a separate stamped steel box with one 3/4" knockout. All parts must have a baked enamel red finish and exposed edges must be rounded. Surface back box must be EST (UTCFS) model #276B-RSB.
      5) Pull stations must be set so that the top of the operating lever of station must be 3'-6" to 4'-0" above the finished floor. The Contractor must bring, in writing, to the attention of the Commissioner any interference with wainscot, or other construction or mechanical equipment.
      6) Provide false fire alarm stopper cover to fit every pull station shown on the drawings. False fire alarm stopper must be Safety Technology International Stopper II P/N – STI 1100 with 9 volts dc battery.
      7) Pull stations located indoors must be EST (UTCFS) SIGA-270.
      8) Weatherproof pull stations must be EST (UTCFS) MPSR1-SHTW-GE.
   b. Area Smoke Detectors:
      1) Contractor must provide photoelectric smoke detectors with bases. Ionization type smoke detectors are not permitted.

2) Smoke detectors must be supervised by the panel for sensitivity rating within acceptable thresholds. Deviations must be annunciated at the Fire Alarm Control Unit & Remote Annunciator(s).
3) All smoke detectors must be supplied with an LED indicator lamp, which will give indication that the smoke detector is active (flash) and latch (on steady) when the detector has tripped into alarm.
4) Area smoke detector must be addressable type EST (UTCFS) model SIGA-PD.

c. Duct Smoke Detectors:
1) Contractor must furnish duct smoke detectors with air sampling exhaust tubes to be installed on the ductwork under HVAC scope. Contractor must wire and program duct smoke detectors.
2) Duct smoke detector's sensor must be photoelectric type and be capable to operate at air velocities between 100 ft/min and 4,000 ft/min
3) The duct smoke detector's housing must be suitable for extreme environments, including a temperature range of -20°F to 158°F and a harsh environment gasket option.
4) Sampling exhaust tubes must extend into the duct air stream up to 8-feet.
5) The housing must accept a remote LED alarm indicator light or a remote alarm indicator light/remote test station where indicated on the plans.
6) Duct smoke detector must be addressable type EST (UTCFS) model SIGA-SD with sampling tube EST (UTCFS) model SD-T8.
7) Remote alarm indicator light must be EST (UTCFS) model SIGA-LED.
8) Remote test station must be EST (UTCFS) model SD-TRM.

d. Heat Detectors:
1) Contractor must provide heat detectors in boiler room and in other locations as shown on plans.
2) Heat detectors must be conventional type with 194°F fix temperature alarm point in boiler rooms and by cooking appliances. Detector must have maximum operating environment temperature of 150°F. Conventional type heat detectors must be EST (UTCFS) model 284B-PL (194°F) and must have an external addressable interface modules EST (UTCFS) model SIGA-CT1.
3) Heat detectors must be addressable type with 135°F fix temperature alarm point and 15°F per minute rate-of-rise alarm point in janitor closets. Addressable type heat detectors must be EST (UTCFS) model SIGA-HRD (135°F).

e. Carbon Monoxide Detectors with Sounder Base:
1) Carbon monoxide detectors must be designed to detect the presence of carbon monoxide.
2) Carbon Monoxide detectors must be installed and operational in accordance with NYC Building Code Section BC 908.7.2.
3) Carbon monoxide detectors must be listed in accordance with UL 2075-04 (revised 7/20/05) and have, at a minimum, the response times as follows:
   a) At 70 +/-5 ppm, unit must alarm within 60-240 minutes.
   b) At 150 +/-5 ppm, unit must alarm within 10-50 minutes.
   c) At 400 +/-10 ppm, unit must alarm within 4-15 minutes.
4) Carbon monoxide detector must be capable to operate at ambient temperatures of 32°F (or less) to 120°F (or more) and non-condensing relative humidity of 0 to 85 percent. Contractor must install the carbon monoxide detectors per manufacturer's published instructions and where conditions don't exceed the detector's temperature and humidity limits.

5) Carbon monoxide detector must be installed with sounder base to produce a “temporal 4” code pattern.
6) Carbon monoxide detectors must be addressable type EST (UTCFS) model SIGA-COD with sounder base EST (UTCFS) model SIGA-AB4GT.
7) Use of Carbon Monoxide Alarms (Standalone) is not permitted.

f. Individually Addressable Monitor Modules (MM):
1) Monitor Modules must interface normally open contacts of sprinkler water flow switches, tamper switches and other supervisory devices to the addressable Fire Alarm System.
2) Each Interface Module must have an individual address to identify the module to the fire alarm control unit. Interface Modules that require an external programmer or PROM burner will not be acceptable.
3) Monitor module must be EST (UTCFS) model SIGA-CT1 (single input) or SIGA-CT2 (double input).

11. Control Devices:
a. Individually Addressable Control Module (CM):
1) Control Modules must interface auxiliary equipment such as door holders, electromagnetic locks, smoke hatches, fire/smoke dampers and fan shut down control points to the addressable Fire Alarm System.
2) Each Control Module must have an individual address to identify the module to the fire alarm control unit. Interface Modules that require an external programmer or PROM burner will not be acceptable.
3) Control module must be EST (UTCFS) model SIGA-CR.

b. Multi-Voltage Relays:
1) Multi-voltage relays must be utilized to interface line-voltage control system with addressable control modules to provide control of dampers, motor starters, etc.
2) Relays must be DPDT and must be rated at 10 amperes, 115 VAC.
3) A single relay must be energized from a source of 24 VDC, 24 VAC, 115 VAC or 230 VAC.
4) A red LED must indicate the relay is energized.
5) The relay must be mounted in a metal enclosure.

12. Notification Appliances:
a. Fire Signal Horns:
1) The horns must be 24 VDC and must have a selectable “Temporal 3” code pattern setting.
2) Each horn must have a high volume setting between 82 and 91 dBA at 10'-0”. Each horn must have adjustable Hi-Lo dBA setting.
3) Horns must be 24 VDC and must allow one pair of wires to power horns and strobes on the circuit.
4) In new construction, the horns and trim ring must be mounted to a flush 2-gang back box with suitably placed threaded holes to accept mounting of the device. In existing construction, surface-mounted back boxes must be finished cast type boxes with no knockouts, Type FS or FD.
5) Horns installed in damp, wet or exterior locations must be provided with a weatherproof box and gasket listed for such application.
6) Horns must be EST (UTCFS) Genesis LED G1 SeriesG1AWF.

b. Fire Signal Strobes:
1) The strobe unit must be field selectable candela levels 15/30/75 and must deliver all characteristics and requirements called for in NFPA 72-2010, as accepted by Appendix Q

of the NYC Building Code and the American with Disabilities Act (ADA), including the "Equivalent Facilitation" rule, and UL 1971.

2) Strobes must be UL listed for use with the FACU/power source to ensure synchronization.
3) Strobes must be listed for wall-mounted application.
4) Strobes must be listed for 24 volt DC and must allow one pair of wires to power horns and strobes on the circuit.
5) In new construction, the strobe and trim ring must be mounted to a flush 2-gang back box with suitably placed threaded holes to accept mounting of the device. In existing construction, surface-mounted back boxes must be finished cast type boxes with no knockouts, Type FS or FD.
6) Strobes installed in damp, wet or exterior locations must be provided with a weatherproof box and gasket listed for such application.
7) Strobes must be EST (UTCFS) Genesis LED G1 Series G1VWF.

c. Fire Signal Horns/ Strobes:
1) Horn/strobe unit must meet all the horns and strobes criteria listed above.
2) Horns/strobe units must be EST (UTCFS) Genesis LED G1 Series G1AVWF.

13. Fire Alarm Remote Annunciator (FARA):
a. Contractor must provide a remote annunciator with a 4-line / 80-character per line LCD display.
1) The LCD must display all alarm, supervisory and troubles conditions in the system.
2) An audible indication of alarm must be integral to the remote annunciator.
3) The remote annunciator must connect to a dedicated Class-B or Class-A wiring using RS-485 interface. It must be capable of wiring distances up to 4,000 feet from the control unit.
4) Each unit LCD display must mimic the main control unit.
5) It must be capable of the following functions: Acknowledge, Signal Silence and Reset, which must be protected from unauthorized use by a key switch or password.
6) The remote annunciator must be EST (UTCFS) model RCLD (EST3X).

14. Fire Alarm Fused Disconnect Switch:
a. Refer to Fusible Switch Assemblies in Specification Section 26 28 19 - Enclosed Switches.
b. Rating of Disconnect Switch must be minimum 60A or higher as required by the connected load.
c. Contractor must provide pad lock to lock handle.

15. Fire Alarm Fused Cut-Out Panel (FCO):
a. Contractor must provide a panel with solid neutral bar and individual cartridge fuse cutouts.
b. Fuse cutouts must be provided with silver sand fuses, current limiting type with an interrupting capacity rating of 200,000 amps (RMS symmetrical). The size of the fuse must be as required by the connected load and the protection of wiring connected to the fuse.
c. Front cover of the panel must have a fire department red baked coating. The cover door must have a directory in a welded frame with a plastic cover. Door lock to be snap-catch type with #47 key.
d. Power connection to fuse cutout must be provided per code.
e. The circuits for the Fire Alarm Systems must be as follows:
1) One (1) circuit for fire alarm panel.
2) One (1) circuit for the Digital Alarm Communicator Transmitter (where applicable).
3) One (1) circuit for each power supply booster (where applicable).
f. The complete assembly must meet N.Y.C. Electrical and Fire code requirements.

16. Uninterruptible Power Supply (UPS):
    a. Contractor must provide a UPS with eight (8) hours battery backup to power the City of New York's provided internet network equipment.
    b. UPS must be UL 1481 / UL 864 or UL Listed ITE (Information Technology Equipment).

2.5 WIRE AND CABLE

A. Description:
1. Power-limited, fire-protective signaling cable.
2. Conductor: Copper.
3. Insulation Rating: 300 V at 150 degrees C.
4. The cable must be provided with a red overall jacket. The cable must be UL 1424 Listed and labeled as follows: NYC Certified Fire Alarm Cable.

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 PREPARATION

A. Existing Work:
1. Remove exposed abandoned fire alarm wiring, including abandoned wiring above accessible ceiling finishes.
2. Cut cable flush with walls and floors, and patch surfaces.
3. Disconnect and remove abandoned fire alarm equipment.
4. Access:
    a. Maintain access to existing fire alarm equipment and other installations remaining active and requiring access.
    b. Modify installation or provide access panel.
5. Extend existing fire alarm installations using materials and methods compatible with existing installations, or as specified.
6. Clean and repair existing fire alarm equipment that is to remain or to be reinstalled.

3.4 INSTALLATION

A. The entire system must be installed in a workmanlike manner, in accordance with approved manufacturer's wiring diagram. The Contractor must furnish all conduit, wiring, outlet boxes, junction boxes, cabinets, and

similar devices necessary for the complete installation. All wiring must be of the type required by NYCBC, recommended by the manufacturer, approved by the FDNY and the Commissioner and specified within.

B. All penetration of floor slabs and firewalls must be sleeved (1" conduit minimum) firestopped in accordance with Section 07 84 00 - Firestopping.

C. End-of-Line Resistors must be furnished as required for mounting as directed by the manufacturer. Devices containing end-of-line resistors must be appropriately labeled. Devices should be labeled so removal of the device is not required to identify the EOL device.

D. All manual pull stations must be mounted 48 inches above the finished floor, as measured to the handle.

E. All audio/visual devices must be mounted 96 inches above the finished floor, as measured to the device bottom. Devices must be mounted no less than 6 inches from the ceiling (whichever is lower).

F. No area smoke detectors must be mounted within 36 inches of any HVAC supply, return air register or lighting fixture.

G. No area smoke or heat detector must be mounted within 12 inches of any wall. All detectors must be installed in strict accordance with NFPA 72.

H. All wiring below ceiling must be in 3\4" Rigid Galvanized Steel (RGS) minimum.

I. All wiring in hung ceiling must be in free air and supported and protected my building structure.

J. All boxes must be painted red and labeled "Interior Fire Alarm".

K. All addressable modules must be mounted within 36 inches of the monitored or controlled point of termination. This will include, but is not necessarily limited to, fan shutdown, sprinkler status points, or door release. Label all addressable modules as to their function.

L. All low voltage wiring terminated to the fire alarm system must be NYC approved plenum-rated with no exceptions and no less than No. 12 AWG in size for NAC circuits and 16 AWG for Initiating Circuits and solid copper.

M. All line voltage (120 VAC) wiring must be no less than No. 12 AWG in size, and solid copper. The green insulated grounding conductor must be No. 10 AWG minimum. FACU must have a dedicated power supply system out arranged per NYC code.

N. All wiring must be color coded throughout, to NYC Electrical Code standards.

O. Power-limited/Non-power-limited NEC wiring standards must be observed.

P. All junction box covers must be painted red.

Q. Fire alarm system wiring must not co-mingle with any other system wiring in the facility. Conduits must not be shared under any circumstance. Only when fire alarm wiring enters the enclosure of a monitored or controlled system will co-habitation be permitted (i.e., at fan starters).

R. Fire alarm control unit enclosures must have engraved labels indicating, “Fire Alarm System”, and the areas of the building served by that panel.

S. Auxiliary relays must be appropriately labeled to indicate “Fire Alarm System” and their specific function (i.e., Fan S-1 shutdown).

T. All fire alarm wiring must be continuous and unspliced. Terminations must only occur at fire alarm devices or control unit enclosures under terminal screws. All other splicing methods are specifically disallowed (i.e., plastic wirenuts).

U. All fire alarm wiring must be installed using a dedicated system of supports (i.e., bridle rings). Fire alarm wiring must not be bundled or strapped to existing conduit, pipe or wire in the facility.

V. All fire alarm wiring must be sleeved when passing through any wall, using conduit sleeves (1” min.) with bushings, and fire stopped in accordance with Code.

W. The system must be arranged to receive power from one (1) 3-wire 120 Vac, 20 A supply. All low voltage operation must be provided from the fire alarm control unit.

X. All fire alarm devices must be accessible for periodic maintenance. Should a device location indicated on the Contract Drawings not meet this requirement, bring it, in writing, to the attention of the Commissioner. Failure to bring such issues to the attention of the Commissioner will be the exclusive liability of the Contractor.

Y. The existing fire alarm system must remain in operation, as required, until such time that approval has been granted for its removal. The Contractor must be responsible for the upkeep of the existing system until such time that it can be removed.

Z. The Contractor must be responsible for the removal of existing fire alarm system components and controls as required upon approval of the FDNY and the Commissioner. All existing fire alarm system components requiring special handling for disposal (due to radioactivity) must be the responsibility of the installing contractor. Written proof of proper disposal by the installing contractor must be required prior to release of outstanding retainage.

3.5 FIELD QUALITY CONTROL

A. The installer or fire alarm equipment vendor must have no less than two (2) NICET Level II fire alarm technicians dedicated to this project.

B. The installer and the Fire Alarm System Vendor must, upon the request of the Commissioner, attend any and all project meetings for the purpose of accurately determining progress.

C. The system must be installed and fully tested under the supervision of an instructed manufacturer’s representative. The system must be demonstrated to perform all of the function as specified.

D. Equipment Acceptance:
   1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
   2. Make final adjustments to equipment under direction of manufacturer’s representative.

E. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

F. It must be the responsibility of the Contractor to assure that construction debris does not adversely affect any sensing devices installed as part of this project. Should it be deemed necessary by the Commissioner, the Contractor must be responsible for the cleaning of all smoke detectors prior to final acceptance.

3.6 TESTS

A. The fire alarm system vendor must test the system in accordance with the manufacturer's requirements and NFPA 72 as amended by the NYC Building Code. The vendor must provide completed reports to the Commissioner for review and approval prior to final acceptance.

B. Each individual system operation on a circuit-by-circuit basis must be tested for its complete operation. The procedure for testing the entire fire alarm system must be set forth with the consent of the code enforcement official, the Commissioner and the manufacturer.

3.7 THE CITY OF NEW YORK'S PRE-ACCEPTANCE ORIENTATION AND MANUALS FOR FACILITY PERSONNEL

A. The Contractor must compile and provide to the City of New York, three (3) complete manuals on the completed system to include site specific operating and maintenance instructions, catalog cuts of all equipment and components, and as-built wiring diagrams.

B. In addition to the above manuals, provide the services of the manufacturer's representative for two (2) separate calendar days for a period of four (4) hours per day to instruct the City of New York's designated personnel on the operation and maintenance of the entire system.

3.8 APPROVAL OF FIRE ALARM SYSTEM INSTALLATION

A. Comply with requirements of NYC Fire Department Rule RCNY, para. 105-01, "Approval of Fire Alarm System Installation".

B. The fire alarm system, as installed, must be approved by the Bureau of Fire Prevention of the New York City Fire Department. A Fire Department Letter of Approval must be obtained by the Contractor as a prerequisite for final acceptance.

END OF SECTION 28 31 00

FMS ID: **LBC16MPHC**

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

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

Department of Design and Construction

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

Mapleton Branch Library HVAC Replacement

LOCATION: **1702 60th Street**
BOROUGH: **Brooklyn, NY 11211**
CITY OF NEW YORK

Contractor

Dated _____ , 20 _____

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____ , 20 _____