



PROJECT ID: LQQ122EE2

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](http://www.nyc.gov/buildnyc)

**LAW**

VOLUME 1 OF 3

# BID BOOKLET

FOR FURNISHING ALL LABOR AND MATERIALS  
NECESSARY AND REQUIRED FOR:

## East Elmhurst Branch Library Expansion

LOCATION:  
BOROUGH:  
CITY OF NEW YORK

95-08 Astoria Boulevard  
Queens 11369

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

Queens Public Library

Garrison Architects



Date: December 30, 2014

115-101

**Bid Tab**

**PLA**  
Description EAST ELMHURST BRANCH LIBRARY EXPANSION -  
BOROUGH OF QUEENS

Bid Date 10/16/2015 FMS ID LQQ122EE2

Estimated Cost \$4,831,249.00 Client Agency Library

Bid Security Not less than 2% of Total Bid Price PLA Yes

Time Allowed 540 CCD Contract Manager Phyllis Lopez

Addendum 3 Project Manager Pixley, Neal

PIN 8502014LQ0006C E-PIN 8502014LQ0006C

Selective Bidding Yes No Consultant Garrison Architects

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Bid Rank	Vendor	Bid Amount	Security Type
1	AFL CONSTRUCTION CO., INC.	\$5,198,211.00	Bond
2	NORTHE GROUP INC.	\$6,370,000.00	Bond
3	NATIONAL ENVIRONMENTAL SAFETY COMPANY CORP. INC.	\$7,962,064.00	Bond
4	ASHNU INTERNATIONAL, INC	\$7,982,000.00	Bond
5	MONGIOVE ASSOCIATES LTD.	\$8,593,276.00	Bond

**SUBCONTRACTORS:**

Plumbing: BTS Plumbing \$275,000.00  
HVAC: Mec-Con Associates Ins. \$288,700.00  
Electrical: Ace Electrical Expert Corp. \$475,000.00

Recorder: Brenda Barreiro Ext.1041

Approver: *Sorain Holley*

Bid Tab  
Pin: 8502014LQ0006C





Department of  
Design and  
Construction

Dr. Feniosky Peña-Mora  
Commissioner

Charlette Hamamgian, Esq.  
Agency Chief  
Contracting Officer

Lorraine Holley  
Deputy ACCO  
Competitive Sealed  
Bid Contracts

June 23, 2016

CERTIFIED MAIL - RETURN RECEIPT REQUEST  
NATIONAL ENVIRONMENTAL SAFETY COMPANY CORP. INC.  
12-17 38TH AVENUE  
LONG ISLAND CITY, NY 11101

RE: FMS ID: LQQ122EE2  
E-PIN: 85014B0176001  
DDC PIN: 8502014LQ0006C  
EAST ELMHURST BRANCH LIBRARY  
EXPANSION - BOROUGH OF QUEENS  
NOTICE OF AWARD

Dear Contractor:

You are hereby awarded the above referenced contract based upon your bid in the amount of \$7,850,000.00\* submitted at the bid opening on October 16, 2015. Within ten (10) days of your receipt of this notice of award, you are required to take the actions set forth in Paragraphs (1) through (3) below. For your convenience, attached please find a copy of Schedule A of the General Conditions to the Contract, which sets forth the types and amounts of insurance coverage required for this contract.

- (1) Execute four copies of the Agreement in the Contracts Unit, 30-30 Thomson Avenue, 1<sup>st</sup> Floor, Long Island City, New York (IDCNY Building). A Commissioner of Deeds will be available to witness and notarize your signature. The Agreement must be signed by an officer of the corporation or a partner of the firm.
- (2) Submit to the Contracts Unit four properly executed performance and payment bonds. If required for this contract, copies of performance and payment bonds are attached.
- (3) Submit to the Contracts Unit the following insurance documentation: (a) original certificate of insurance for general liability in the amount required by Schedule A, and (b) original certificates of insurance or other proof of coverage for workers' compensation and disability benefits, as required by New York State Law. The insurance documentation specified in this paragraph is required for registration of the contract with the Comptroller's Office.

\*Negotiated Amount



Department of  
Design and  
Construction

On or before the contract commencement date, you are required to submit all other certificates of insurance and/or policies in the types and amounts required by Schedule A. Such certificates of Insurance and/or policies must be submitted to the Agency Chief Contracting Office, Attention: Risk Manager, Fourth Floor at the above indicated department address.

Your attention is directed to the section of the Information for Bidders entitled "Failure to Execute Contract". As indicated in this section, in the event you fail to execute the contract and furnish the required bonds within the (10) days of your receipt of this notice of award, your bid security will be retained by the City and you will be liable for the difference between your bid price and the price for which the contract is subsequently awarded, less the amount of the bid security retained.

Sincerely,

A handwritten signature in cursive script that reads "Lorraine Holley".

Lorraine Holley

## **NOTICE TO BIDDERS:**

- **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 Contract for General Construction Work.

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.

## **SPECIAL NOTICE TO BIDDERS**

The New York City Department of Small Business Services (SBS), in conjunction with the New York Business Development Corporation (NYBDC), have established a NYC Construction Loan pilot program to provide prime contractors and subcontractors financing for mobilization costs on certain City construction projects.

Under this initiative, loans are available for early stage mobilization needs such as insurance, labor, supplies and equipment. Bidders are strongly encouraged to visit "Growing Your Business" at [www.nyc.gov/nycbusiness](http://www.nyc.gov/nycbusiness) to learn more about the loan or contact [constructionloan@sbs.nyc.gov](mailto:constructionloan@sbs.nyc.gov) / (212) 513-6444 to obtain details and to determine preliminary eligibility.

A successful loan applicant will be required to make an assignment of its contract (or subcontract) payments to the lender NYBDC until the loan is repaid. If the loan is to a subcontractor, a prime contractor must honor the terms of such an assignment.

A prime contractor may not discriminate against a subcontractor or potential subcontractor by reason of the subcontractor's participation, or nonparticipation, in the NYC Construction Loan program.

**BID BOOKLET  
PART A**

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**PROJECT ID: LQQ122EE2**

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

**BID BOOKLET**

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

**SPECIAL NOTICE TO BIDDERS**

**BID SUBMISSION REQUIREMENTS**

**THE BID SHALL CONSIST OF TWO (2) SEPARATE, SEALED ENVELOPES. THE DOCUMENTS THAT MUST BE COMPLETED AND INCLUDED IN EACH SEPARATE ENVELOPE ARE LISTED BELOW.**

**BID ENVELOPE #1:** Bid Envelope #1 shall contain the following items:

- Bid Form, including Affirmation
- Bid Security (if required, see page 22)
- Schedule B: M/WBE Utilization Plan (if participation goals have been established)

**BID ENVELOPE #2:** Bid Envelope #2 shall contain **ONLY** the following item:

- Bidder's Identification of Subcontractors (see pages 16 & 17)

**FAILURE TO SUBMIT THE FOUR ITEMS LISTED ABOVE  
WILL RESULT IN THE DISQUALIFICATION OF THE BID**

**BID ENVELOPE #1:** In addition to the items listed above, Bid Envelope #1 shall also contain the following items: **DO NOT** Include the items listed below in Bid Envelope #2.

- Bid Breakdown (if required, see page 21)
- Safety Questionnaire
- Construction Employment Report (if bid is \$1,000,000 or more)
- Contract Certificate (if bid is less than \$1,000,000)
- Confirmation of Vendex Compliance
- Bidder's Certification of Compliance with Iran Divestment Act
- Special Experience Requirements Qualification Form (if required, see pages 3, 4)
- Any Addenda issued prior to the receipt of bids

**FAILURE TO SUBMIT THE EIGHT ITEMS LISTED ABOVE  
MAY RESULT IN THE DISQUALIFICATION OF THE BID.**

- NOTES:**
- (1) All of the above referred to blank forms to be completed and submitted with the bid are included in the BID BOOKLET.
  - (2) If the bidder has any questions or requires additional information, please contact the Department of Design and Construction by phone (718-391-2601) or by fax (718-391-2615).
  - (3) **VENDEX QUESTIONNAIRES:** Vendex Questionnaires, as well as detailed instructions, may be obtained at [www.nyc.gov/vendex](http://www.nyc.gov/vendex). The bidder may also obtain Vendex forms and instructions by contacting the Agency Chief Contracting Officer or the contact person for this contract.
  - (4) **SPECIAL EXPERIENCE REQUIREMENTS:** The Bidder is advised that Special Experience Requirements may apply to this contract. Such requirements are set forth on pages 3 and 4 of this Bid Booklet.
  - (5) **SPECIAL EXPERIENCE REQUIREMENTS FOR ASBESTOS:** The Bidder is advised that this contract contains strict requirements regarding the prior experience and licensing of the subcontractor who will perform any required asbestos abatement work. These special experience requirements are set forth in the section of the specifications which describes any required asbestos abatement work.



## Special Notice to Bidders – Proprietary Items

- A. General: A proprietary item required for the Project is specified below. The contractor is required to provide and install such proprietary item. The Contractor must provide the specified item from the designated manufacturer. Substitutions are not permissible and will not be approved. More detailed information regarding the item is set forth in the Specifications. Such information includes item description, as well as requirements for installation and related materials.
- B. Payment: For the required proprietary item, an allowance amount is indicated. The allowance provides a stipulated amount to reimburse the Contractor for the purchase of the proprietary item from the designated manufacturer. Payment from the allowance shall be limited to the purchase price of the specified proprietary item and shall exclude any costs above and beyond the purchase price. Payment from the allowance shall not include any of the following costs with respect to the specified proprietary item: (1) any mark-up for the Contractor's overhead and profit, (2) any costs for transportation, including delivery, shipping or special handling costs, (3) any costs for installation, and (4) any costs for related materials. Payment for the specified proprietary item shall be based on the invoice actually provided by the manufacturer.
- C. Bid Form: A total allowance amount for the purchase of all required proprietary items is set forth on the Bid Form. In preparing the lump sum portion of its bid, the Contractor shall:
- (1) Exclude from its bid any costs for the purchase of the proprietary items, and
  - (2) Include in its bid any costs above and beyond the purchase price, including without limitation, costs for transportation, delivery, installation, related materials and overhead.
- D. Required Proprietary Item(s):

### CONTRACT NO. 1:

- |                        |   |
|------------------------|---|
| 1. Proprietary Item:   | <i>Modified Bitumen Membrane Roofing</i>        |
| Specification Section: | <i>07 52 00</i>                                 |
| Manufacturer:          | <i>Siplast Paradiene 30 CR FR</i>               |
| Allowance Amount:      | Not to Exceed: \$24,570                         |
|                        |   |
| 2. Proprietary Item:   | <i>Door Hardware: Mortise Locksets</i>          |
| Specification Section: | <i>08 71 00</i>                                 |
| Manufacturer:          | <i>Best Access Systems, 45 Series (45HR-3R)</i> |
| Allowance Amount:      | Not to Exceed: \$1,444                          |

3. Proprietary Item: *Door Hardware: Keyed Cylinders*  
Specification Section: *08 71 00*  
Manufacturer: *Best Access Systems, 1E Series*  
Allowance Amount: *Not to Exceed: \$ 492*
  
4. Proprietary Item: *Door Hardware: Exit Devices and Trim*  
Specification Section: *08 71 00*  
Manufacturer: *Von Duprin, 55 Series (5547-RX, extended rod; trim 371L-03-BE)*  
Allowance Amount: *Not to Exceed: \$ 5,053*
  
5. Proprietary Item: *Door Hardware: Electric Strikes*  
Specification Section: *08 71 00*  
Manufacturer: *Von Duprin, 6000 Series (6211AL-FSE)*  
Allowance Amount: *Not to Exceed: \$591*
  
6. Proprietary Item: *Security System: Access Control System*  
Specification Section: *28 00 00*  
Manufacturer: *Sielox*  
Allowance Amount: *Not to Exceed: \$786*
  
7. Proprietary Item: *Security System: Card Reader*  
Specification Section: *28 00 00*  
Manufacturer: *HID Global, iClass*  
Allowance Amount: *Not to Exceed: \$2,752*
  
8. Proprietary Item: *Security System: Alarm Panel*  
Specification Section: *28 00 00*  
Manufacturer: *Honeywell International, ADEMCO Vista*  
Allowance Amount: *Not to Exceed: \$826*
  
9. Proprietary Item: *Security System: Network Video Recorder*  
Specification Section: *28 00 00*  
Manufacturer: *Axis Communications*  
Allowance Amount: *Not to Exceed: \$3,932*

10. Proprietary Item: *Security System: Fixed Network Cameras*  
Specification Section: *28 00 00*  
Manufacturer: *Axis Communications*  
Allowance Amount: Not to Exceed: \$30,454

11. Proprietary Item: *Fire Alarm System: Remote Annunciator Panel and Devices*  
Specification Section: *28 31 00*  
Manufacturer: *Edwards System Technology*  
Allowance Amount: Not to Exceed: \$9,561

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## SPECIAL EXPERIENCE REQUIREMENTS

Bidders are advised that the special experience requirements set forth below apply to the General Construction Contractor if a check mark is indicated before the word "Yes". Compliance with these special experience requirements will be determined solely by the City. Failure to meet these special experience requirements will result in the rejection of the bid as non-responsive.

General Construction Contractor                        x        YES                                      NO

- (A) **EXPERIENCE REQUIREMENTS FOR THE BIDDER (PRIME CONTRACTOR):** The special experience requirements set forth below apply to the bidder. Compliance with such special experience requirements will be evaluated at the time of the bid.
- 1) The bidder must, with the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work.
- (B) **QUALIFICATION FORM:** For each project submitted to meet the experience requirements set forth above, the bidder must complete and submit with its bid the Qualification Form set forth in this Bid Booklet. All information on the Qualification Form must be provided.
- (C) **CONDITIONS:** The City may, in determining compliance with the special experience requirements set forth above, consider prior projects completed by principal(s) or other employees of the bidder while affiliated with another entity, subject to the conditions set forth below.
- 1) Any principal or other employee on whose prior experience the bidder is relying to demonstrate compliance with this special experience requirement must have held the following: (a) a significant management role in the prior entity with which he/she was affiliated, and (b) a significant management role in the entity submitting the bid for a period of six months or from the inception of the bidding entity.
  - 2) The bidder may not rely on the experience of its principals or other employees to demonstrate compliance with any other requirements, including without limitation, financial requirements or requirements for a specified minimum amount of annual gross revenues.
- (D) **JOINT VENTURES:** In the event the bidder is a joint venture, at least one firm in the joint venture must meet the above described experience requirements.
- (E) **COMPLIANCE:** Compliance with the experience requirements set forth herein will be determined solely by the City. The bidder is advised that failure to meet the above described experience will result in the rejection of the bid as non-responsive.

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**Qualification Form**

Project ID: LQQ122EE2

List previous projects completed to meet the special experience requirements for this contract. Please photocopy this form for submission of all required projects.

Name of Contractor: \_\_\_\_\_

Name of Project: \_\_\_\_\_

Location of Project: \_\_\_\_\_

Owner or Owner's representative (Architect or Engineer) who is familiar with the work performed:

Name: \_\_\_\_\_

Title: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Brief description of work completed: \_\_\_\_\_

\_\_\_\_\_

Was the work performed as a prime or a subcontractor: \_\_\_\_\_

Amount of Contract: \_\_\_\_\_

Date of Completion: \_\_\_\_\_

\*\*\*\*\*

Name of Contractor: \_\_\_\_\_

Name of Project: \_\_\_\_\_

Location of Project: \_\_\_\_\_

Owner or Owner's representative (Architect or Engineer) who is familiar with the work performed:

Name: \_\_\_\_\_

Title: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Brief description of work completed: \_\_\_\_\_

\_\_\_\_\_

Was the work performed as a prime or a subcontractor: \_\_\_\_\_

Amount of Contract: \_\_\_\_\_

Date of Completion: \_\_\_\_\_

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## MWBE PROGRAM

### M/WBE UTILIZATION PLAN

**M/WBE Program Requirements:** The requirements for the M/WBE Program are set forth on the following pages of this Bid Booklet, in the section entitled "Notice to All Prospective Contractors".

**Schedule B: M/WBE Utilization Plan:** Schedule B: M/WBE Utilization Plan for this Contract is set forth in this Bid Booklet on the pages following the section entitled "Notice to All Prospective Contractors". The M/WBE Utilization Plan (Part I) indicates whether Participation Goals have been established for this Contract. If Participation Goals have been established for this Contract, the bidder must submit an M/WBE Utilization Plan (Part II) with its bid.

**Waiver:** The bidder may seek a full or partial pre-award waiver of the Participation Goals in accordance with the "Notice to All Prospective Contractors" (See Part A, Section 10). The bidder's request for a waiver must be submitted at least seven (7) calendar days prior to the bid date. Waiver requests submitted after the deadline will not be considered. The form for requesting a waiver of the Participation Goals is set forth in the M/WBE Utilization Plan (Part III).

**Rejection of the Bid:** The bidder must complete Schedule B: M/WBE Utilization Plan (Part II) set forth in this Bid Booklet on the pages following the section entitled "Notice to All Prospective Contractors". A Schedule B submitted by the bidder which does not include the Vendor Certification and Required Affirmations (See Section V of Part II) will be deemed to be non-responsive, unless a full waiver of the Participation Goals is granted (Schedule B, Part III). In the event that the City determines that the bidder 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 Required Affirmations, the bidder 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 is non-responsive.

Receipt of notification is defined as the date notice is emailed or faxed (if the bidder has provided an email address or fax number), or no later than five (5) days from the date of mailing or upon delivery, if delivered.

**Impact on LBE Requirements:** If Participation Goals have been established for the participation of M/WBEs, the contractor is not required to comply with the Locally Based Enterprise Program ("LBE"). The LBE Program is set forth in Article 67 of the Contract.

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NOTICE TO ALL PROSPECTIVE CONTRACTORS

PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED BUSINESS  
ENTERPRISES IN CITY PROCUREMENT

ARTICLE I. M/WBE PROGRAM

Local Law No. 129 of 2005 added and Local Law 1 of 2013 amended Section 6-129 of the Administrative Code of the City of New York (hereinafter "Section 6-129"). 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. 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 I to this Contract (see Page 1, line 1 Total Participation Goals) or will be set forth on Schedule B, Part I 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 New York City Department of Small Business Services 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 II (see Pages 2-4) 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; and (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. 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 II (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 II (see Pages 2-4) 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; and (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. 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 II). A SCHEDULE B SUBMITTED BY THE BIDDER/PROPOSER WHICH DOES NOT INCLUDE THE VENDOR CERTIFICATION AND REQUIRED AFFIRMATIONS (SEE SECTION V OF PART II) WILL BE DEEMED TO BE NON-RESPONSIVE, UNLESS A FULL WAIVER OF THE PARTICIPATION GOALS IS GRANTED (SCHEDULE B, PART III). 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 MBE and WBE firms may be obtained from the DSBS website at [www.nyc.gov/buycertified](http://www.nyc.gov/buycertified), by emailing DSBS at [buyer@sbs.nyc.gov](mailto:buyer@sbs.nyc.gov), by calling (212) 513-6356, or by visiting or writing DSBS at 110 William St., New York, New York, 10038, 7th floor. Eligible firms that have not yet been certified may contact DSBS in order to seek certification by visiting [www.nyc.gov/getcertified](http://www.nyc.gov/getcertified), emailing [MWBE@sbs.nyc.gov](mailto: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 III (Page 5) 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 [rodrigur@ddc.nyc.gov](mailto:rodrigur@ddc.nyc.gov) or via facsimile at (718) 391-1885. Bidders, proposers, or contractors, as applicable, who have submitted 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 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.

13. 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.

14. 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 an **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 an **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 VENDEX as caution data.



Tax ID #: \_\_\_\_\_

APT E-  
PIN#: 85014B0176

Contract # 1 - General Construction Work

### SCHEDULE B - M/WBE Utilization Plan

#### Part I: M/WBE Participation Goals

Part I to be completed by contracting agency

#### Contract Overview

APT E-Pin # 85014B0176 FMS Project ID#: LQQ122EE2

Project Title/Agency East Elmhurst Branch Library Expansion

PIN # 8502014LQ0006C

Bid/Proposal Response Date: OCTOBER 02, 2015

Contracting Agency Department of Design and Construction

Agency Address 30-30 Thomson Avenue City Long Island City State NY Zip Code 11101

Contact Person Norma Negrón Title MWBE Liaison & Compliance Analyst

Telephone # (718) 391-1502 Email negronn@ddc.nyc.gov

#### Project Description (attach additional pages if necessary)

This Project consists of a new 4,295 SF single story addition to the existing library on the adjacent property. The building is a steel frame structure with concrete block shear walls. There are three distinct volumes added to the existing building: a small unconditioned storage shed, a new Young Adult area spatially contiguous with the existing library, and a new Multipurpose room and Courtyard adjacent to the existing reading room. A new roof and entry canopy ties all new construction together to the existing library. The exterior includes new precast concrete pavers on concrete slab at the existing library entry and the new Multipurpose Room entry. This finish continues to the interior and clads the ramp through the Courtyard. There is also a precast paver-clad concrete slab in Rear Yard terrace. A metal mesh fence encloses the Rear Yard, which is landscaped with plantings, gravel pavement and a new tree. Five new street trees will be added, along with enlarging the existing street trees. The existing flagpole and bike racks will be re-installed, along with the existing pin letter sign. A new aluminum sign will be added to the exterior of the storage shed, and new markings will be added to the glass doors and sidelights.

#### M/WBE Participation Goals for Services

Enter the percentage amount for each group or for an unspecified goal. Please note that there are no goals for Asian Americans in Professional Services

Prime Contract Industry: Construction

Group	Percentage
<u>Unspecified *</u>	<u>25 %</u>
OR	
<u>Black American</u>	<u>Unspecified %</u>
<u>Hispanic American</u>	<u>Unspecified %</u>
<u>Asian American</u>	<u>Unspecified %</u>
<u>Women</u>	<u>Unspecified %</u>
<b>Total Participation Goals</b>	<b>25 %</b>

Line 1

\* Note: For this procurement, individual ethnicity and gender goals are not specified. The Total Participation Goals for construction contracts may be met by using Black American, Hispanic American, Asian American or Women certified firms or any combination of such firms.

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Tax ID #: 11-293 9703

APT E-  
PIN#: 85014B0176

**SCHEDULE B - Part II: M/WBE Participation Plan**

Part II to be completed by the bidder/proposer:

Please note: For Non-M/WBE Prime Contractors who will NOT subcontract any services and will self-perform the entire contract, you must obtain a FULL waiver by completing the Waiver Application on pages 9 and 9a and timely submitting it to the contracting agency pursuant to the Notice to Prospective Contractors. Once a FULL WAIVER is granted, it must be included with your bid or proposal and you do not have to complete or submit this form with your bid or proposal.

Section I: Prime Contractor Contact Information			
Tax ID #	<u>11-293 9703</u>	FMS Vendor ID #	
Business Name	<u>National Environmental Safety</u>	Contact Person	<u>Mark Canellos</u>
Address	<u>12-17 38<sup>th</sup> Ave, LIC, NY 11101</u>	Co Inc.	
Telephone #	<u>(718) 361-0044</u>	Email	<u>national@nesco.cc</u>

**Section II: M/WBE Utilization Goal Calculation: Check the applicable box and complete subsection.**

PRIME CONTRACTOR ADOPTING AGENCY M/WBE PARTICIPATION GOALS			
<input checked="" type="checkbox"/> For Prime Contractors (including Qualified Joint Ventures and M/WBE firms) adopting Agency M/WBE Participation Goals.  Calculate the total dollar value of your total bid that you agree will be awarded to M/WBE subcontractors for services and/or credited to an M/WBE prime contractor or Qualified Joint Venture.  Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation.	Total Bid/Proposal Value  <u>7,853,553</u> \$	Agency Total Participation Goals (Line 1, Page 6)  <u>25 %</u> X	Calculated M/WBE Participation Amount  <u>1,963,388</u> \$ Line 2

PRIME CONTRACTOR OBTAINED PARTIAL WAIVER APPROVAL: ADOPTING MODIFIED M/WBE PARTICIPATION GOALS			
<input type="checkbox"/> For Prime Contractors (including Qualified Joint Ventures and M/WBE firms) adopting Modified M/WBE Participation Goals.  Calculate the total dollar value of your total bid that you agree will be awarded to M/WBE subcontractors for services and/or credited to an M/WBE prime contractor or Qualified Joint Venture.  Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation.	Total Bid/Proposal Value  \$	Adjusted Participation Goal (From Partial Waiver)  X	Calculated M/WBE Participation Amount  \$ Line 3

**Section III: M/WBE Utilization Plan: How Proposer/Bidder Will Fulfill M/WBE Participation Goals. 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 above, 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 above, 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 above, as applicable.

**Section IV: 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? % 35

*Enter brief description of the type(s) and dollar value of subcontracts for all any services you plan on subcontracting if awarded this contract. For each item, indicate whether the work is designated for participation by MBEs and/or WBEs and the time frame in which such work is scheduled to begin and end. Use additional sheets if necessary.*

- 1. HVAC 347,000
- 2. Elect 1,347,000
- 3. Plum 178,000
- 4. Concrete 400,000
- 5. Landscap 100,000
- 6. Steel 600,000
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.

Scopes of Subcontract Work

**Section V: 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 Mark Canellas  
 Print Name Mark Canellas

Date October 16, 2015  
 Title Vice President

Tax ID #: \_\_\_\_\_

APT E-

PIN#: 85014B0176

**SCHEDULE B - Part II: M/WBE Participation Plan**

Part II to be completed by the bidder/proposer:

Please note: For Non-M/WBE Prime Contractors who will NOT subcontract any services and will self-perform the entire contract, you must obtain a FULL waiver by completing the Waiver Application on pages 9 and 9a and timely submitting it to the contracting agency pursuant to the Notice to Prospective Contractors. Once a FULL WAIVER is granted, it must be included with your bid or proposal and you do not have to complete or submit this form with your bid or proposal.

Section I: Prime Contractor Contact Information	
Tax ID # _____	FMS Vendor ID # _____
Business Name _____	Contact Person _____
Address _____	
Telephone # _____	Email _____

**Section II: M/WBE Utilization Goal Calculation: Check the applicable box and complete subsection.**

PRIME CONTRACTOR ADOPTING AGENCY M/WBE PARTICIPATION GOALS					
<input type="checkbox"/> For Prime Contractors (including Qualified Joint Ventures and M/WBE firms) adopting Agency M/WBE Participation Goals.  Calculate the total dollar value of your total bid that you agree will be awarded to M/WBE subcontractors for services and/or credited to an M/WBE prime contractor or Qualified Joint Venture.  Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation.	Total Bid/Proposal Value		Agency Total Participation Goals (Line 1, Page 6)		Calculated M/WBE Participation Amount
	\$	X		=	\$ Line 2
PRIME CONTRACTOR OBTAINED PARTIAL WAIVER APPROVAL: ADOPTING MODIFIED M/WBE PARTICIPATION GOALS					
<input type="checkbox"/> For Prime Contractors (including Qualified Joint Ventures and M/WBE firms) adopting Modified M/WBE Participation Goals.  Calculate the total dollar value of your total bid that you agree will be awarded to M/WBE subcontractors for services and/or credited to an M/WBE prime contractor or Qualified Joint Venture.  Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation.	Total Bid/Proposal Value		Adjusted Participation Goal (From Partial Waiver)		Calculated M/WBE Participation Amount
	\$	X		=	\$ Line 3

**Section III: M/WBE Utilization Plan: How Proposer/Bidder Will Fulfill M/WBE Participation Goals. 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 above, 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 above, 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 above, as applicable.

**Section IV: 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? % \_\_\_\_\_

*Enter brief description of the type(s) and dollar value of subcontracts for all any services you plan on subcontracting if awarded this contract. For each item, indicate whether the work is designated for participation by MBEs and/or WBEs and the time frame in which such work is scheduled to begin and end. Use additional sheets if necessary.*

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_
- 8. \_\_\_\_\_
- 9. \_\_\_\_\_
- 10. \_\_\_\_\_
- 11. \_\_\_\_\_
- 12. \_\_\_\_\_
- 13. \_\_\_\_\_
- 14. \_\_\_\_\_
- 15. \_\_\_\_\_
- 16. \_\_\_\_\_
- 17. \_\_\_\_\_

✓ **Scopes of Subcontract Work**

**Section V: 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 \_\_\_\_\_  
Print Name \_\_\_\_\_

Date \_\_\_\_\_  
Title \_\_\_\_\_

**SCHEDULE B – PART III – REQUEST FOR WAIVER OF M/WBE PARTICIPATION REQUIREMENT**

**Contract Overview**

Tax ID # \_\_\_\_\_ FMS Vendor ID # \_\_\_\_\_  
 Business Name \_\_\_\_\_  
 Contact Name \_\_\_\_\_ Telephone # \_\_\_\_\_ Email \_\_\_\_\_  
 Type of Procurement  Competitive Sealed Bids  Other Bid/Response Due Date \_\_\_\_\_  
 APT E-PIN # (for this procurement): \_\_\_\_\_ Contracting Agency: \_\_\_\_\_

**M/WBE Participation Goals as described in bid/solicitation documents**

\_\_\_\_\_ % Agency M/WBE Participation Goal

**Proposed M/WBE Participation Goal as anticipated by vendor seeking waiver**

\_\_\_\_\_ % of the total contract value anticipated in good faith by the bidder/proposer to be subcontracted for services and/or credited to an M/WBE Prime Contractor or Qualified Joint Venture.

**Basis for Waiver Request: Check appropriate box & explain in detail below (attach additional pages if needed)**

- Vendor does not subcontract services, and has the capacity and good faith intention to perform all such work itself with its own employees.
- Vendor subcontracts *some* of this type of work but at a *lower* % than bid/solicitation describes, and has the capacity and good faith intention to do so on this contract. (Attach subcontracting plan outlining services that the vendor will self-perform and subcontract to other vendors or consultants.)
- Vendor has other legitimate business reasons for proposing the M/WBE Participation Goal above. Explain under separate cover.

**References**

List 3 most recent contracts performed for NYC agencies (if any). Include information for each subcontract awarded in performance of such contracts. Add more pages if necessary.

CONTRACT NO.	AGENCY	DATE COMPLETED
Total Contract Amount \$ _____	Total Amount Subcontracted \$ _____	
Item of Work Subcontracted and Value of subcontract _____	Item of Work Subcontracted and Value of subcontract _____	Item of Work Subcontracted and Value of subcontract _____
CONTRACT NO.	AGENCY	DATE COMPLETED
Total Contract Amount \$ _____	Total Amount Subcontracted \$ _____	
Item of Work Subcontracted and Value of subcontract _____	Item of Work Subcontracted and Value of subcontract _____	Item of Work Subcontracted and Value of subcontract _____
CONTRACT NO.	AGENCY	DATE COMPLETED
Total Contract Amount \$ _____	Total Amount Subcontracted \$ _____	
Item of Work Subcontracted and Value of subcontract _____	Item of Work Subcontracted and Value of subcontract _____	Item of Work Subcontracted and Value of subcontract _____

List 3 most recent contracts performed for other entities. Include information for each subcontract awarded in performance of such contracts. Add more pages if necessary.

(Complete ONLY if vendor has performed fewer than 3 New York City contracts.)

TYPE OF Contract	ENTITY	DATE COMPLETED
Manager at entity that hired vendor (Name/Phone No./Email)		
Total Contract Amount \$	Total Amount Subcontracted \$	
Type of Work Subcontracted		

TYPE OF Contract	AGENCY/ENTITY	DATE COMPLETED
Manager at agency/entity that hired vendor (Name/Phone No./Email)		
Total Contract Amount \$	Total Amount Subcontracted \$	
Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract

TYPE OF Contract	AGENCY/ENTITY	DATE COMPLETED
Manager at entity that hired vendor (Name/Phone No./Email)		
Total Contract Amount \$	Total Amount Subcontracted \$	
Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract	Item of Work Subcontracted and Value of subcontract

**VENDOR CERTIFICATION:** I hereby affirm that the information supplied in support of this waiver request is true and correct, and that this request is made in good faith.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Print Name: \_\_\_\_\_ Title: \_\_\_\_\_

*Shaded area below is for agency completion only*

**AGENCY CHIEF CONTRACTING OFFICER APPROVAL**  
 Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**CITY CHIEF PROCUREMENT OFFICER APPROVAL**  
 Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Waiver Determination**

Full Waiver Approved:   
 Waiver Denied:   
 Partial Waiver Approved:   
 Revised Participation Goal: \_\_\_\_\_ %



#3

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

BID FOR FURNISHING ALL LABOR AND  
MATERIAL NECESSARY AND REQUIRED FOR:

PROJECT ID: LQQ12EE2

East Elmhurst Branch Library Expansion  
95-08 Astoria Boulevard  
Queens 11369

Name of Bidder: National Environmental Safety Inc.

Date of Bid Opening: October 16<sup>th</sup> 2015

Bidder is: (Check one, whichever applies) Individual ( ) Partnership ( ) Corporation

Place of Business of Bidder: 12-17 38<sup>th</sup> Avenue, LIC, NY 11101

Bidder's Telephone Number: (718) 361-0044 Bidder's Fax Number: (718) 361-0846

Bidder's Email Address: national@nesco.cc

Residence of Bidder (If Individual): \_\_\_\_\_

If Bidder is a Partnership, fill in the following blanks:  
Names of Partners Residence of Partners

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

If Bidder is a Corporation, fill in the following blanks:  
Organized under the laws of the State of New York

Name and Home Address of President: Dominick Fertilta, President  
28-35 208<sup>th</sup> Street, Bayside, NY 11360

Name and Home Address of Secretary: Mark Caneolo, Vice President  
24-24 Little Neck Blvd, Bayside, NY 11360

Name and Home Address of Treasurer: \_\_\_\_\_

BID FORM

National Environmental Safety Co. Inc.

The above-named 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 set forth on the Affirmation included as page 17 of this Bid Booklet.

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

6. 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.

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.

7. 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.

8. 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.

9. 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:

10. **M/WBE UTILIZATION PLAN:** By signing its bid, the bidder agrees to the Vendor Certification and Required Affirmations set forth below, unless a full waiver of the Participation Goals is granted. The Vendor Certification and Required Affirmations will be deemed to satisfy the requirement to complete Section V of Part II of Schedule B: M/WBE Utilization Plan.

**Section V: Vendor Certification and Required Affirmations:**

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
- 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.

BID FORM

PROJECT ID: LQQ122EE2

TOTAL BID PRICE: In the space provided below, the Bidder shall indicate the total bid price in figures.

- A. LUMP SUM PRICE - Total price for all labor and material for all required work, excluding items (B), (C) and (D) set forth below. Total Price shall include all costs and expenses, i.e. labor, material overhead and profit for all the Work, described and shown in the drawings and specifications.

Total Price for Material Sold and Delivered

Total Price For Labor

\$ 2,793,502 +

\$ 5,059,667

Total Price for Item A = \$ 7,853,553

- B. ALLOWANCE for Incidental Asbestos Abatement (Section 028013 of the Specifications)

\$15,000.00

- C. ALLOWANCE for Tree Restitution (Section 329300 of the Specifications)

\$13,050.00

- D. AMOUNT for Proprietary Items (pages 2a-c)

\$80,461.00

TOTAL BID PRICE (Add A + B + C + D) ( a/k/a BID PROPOSAL)

\$ 7,962,064 -

10/16/15 BB

BIDDER'S SIGNATURE AND AFFIDAVIT

\* SUBCONTRACTOR IDENTIFICATION: You MUST complete and submit the form entitled "Bidder's Identification of Subcontractors" (page 17) at the time you submit your bid. You must submit this form in a separate, sealed envelope (BID ENVELOPE #2). In the event an award of contract is not made to the Bidder, the Bidder hereby authorizes the Agency to shred the form entitled "Bidder's Identification of Subcontractors". Yes No

Bidder: National Environmental Safety Co. Inc.

By: [Signature] (Signature of Partner or corporate officer)

Attest: [Signature v. P/sec.] Secretary of Corporate Bidder (Corporate Seal)

Affidavit on the following page should be subscribed and sworn to before a Notary Public

**BID FORM (TO BE NOTARIZED)**

\*\*\*\*\*

AFFIDAVIT WHERE BIDDERS IS AN INDIVIDUAL

STATE OF NEW YORK, COUNTY OF \_\_\_\_\_ ss:

being duly sworn says:

I am the person described in and who executed the foregoing bid, and the several matters therein stated are in all respects true.

\_\_\_\_\_  
(Signature of the person who signed the Bid)

Subscribed and sworn to before me this  
\_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_  
Notary Public

\*\*\*\*\*

AFFIDAVIT WHERE BIDDERS IS A PARTNERSHIP

STATE OF NEW YORK, COUNTY OF \_\_\_\_\_ ss:

being duly sworn says:

I am a member of \_\_\_\_\_ the firm described in and which executed the foregoing bid. I subscribed the name of the firm thereto on behalf of the firm, and the several matters therein stated are in all respects true.

\_\_\_\_\_  
(Signature of Partner who signed the Bid)

Subscribed and sworn to before me this  
\_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_  
Notary Public

\*\*\*\*\*

AFFIDAVIT WHERE BIDDERS IS A CORPORATION

STATE OF NEW YORK, COUNTY OF Queens ss:

being duly sworn says:

I am the Vice President of the above named corporation whose name is subscribed to and which executed the foregoing bid. I reside at 24-40 Littleneck Blvd, Bayside, NY 11380. I have knowledge of the several matters therein stated, and they are in all respects true.

[Signature]  
(Signature of Corporate Officer who signed the Bid)

Subscribed and sworn to before me this  
16<sup>th</sup> day of October, 2015

[Signature]  
Notary Public

**JAMIE RIVERA**  
Notary Public - State of New York  
No. 01R16245854  
Bronx County  
Comm. Exp. August 8, 2019

**AFFIRMATION**

The undersigned bidder affirms and declares that said bidder is not in arrears to the City of New York upon debt, contract or taxes and is not a defaulter, as surety or otherwise, upon obligation to the City of New York, and has not been declared not responsible, or disqualified, by any agency of the City of New York, nor is there any proceeding pending relating to the responsibility or qualification of the bidder to receive public contracts except None

(If none, the bidder shall insert the word "None" in the space provided above.)

Full Name of Bidder: National Environmental Safety Co Inc.  
Address: 12-17 38<sup>th</sup> Avenue  
City: LIC State: NY Zip Code: 11101

**CHECK ONE BOX AND INCLUDE APPROPRIATE NUMBER:**

A - Individual or Sole Proprietorship \*  
SOCIAL SECURITY NUMBER

B - Partnership, Joint Venture or other unincorporated organization  
EMPLOYER IDENTIFICATION NUMBER

C - Corporation  
EMPLOYER IDENTIFICATION NUMBER  
11-293 9703

By: Mukul W P  
Signature:  
Title: Vice President

If a corporation, place seal here

This affirmation must be signed by an officer or duly authorized representative.  
\* Under the Federal Privacy Act the furnishing of Social Security Numbers by bidders on City contracts is voluntary. Failure to provide a Social Security Number will not result in a bidder's disqualification. Social Security Numbers will be used to identify bidders, proposers or vendors to ensure their compliance with laws, to assist the City in enforcement of laws, as well as to provide the City a means of identifying of businesses which seek City contracts.

## BIDDER'S IDENTIFICATION OF SUBCONTRACTORS

Project ID: LQQ122EE2

**SUBMISSION:** In addition to its Bid (Bid Envelope # 1), the Bidder must, at the time of the bid, complete and submit this form in a separate, sealed envelope (Bid Envelope # 2). To complete this form, the Bidder must identify the subcontractors it intends to use for the work listed below, as well as the dollar amount to be paid to each subcontractor. Failure to complete this form and submit it in a separate, sealed envelope will result in the disqualification of the bid as non-responsive.

The Bidder intends to use the following subcontractors. If the Bidder intends to do any of the work referenced below with its own forces, the Bidder should complete this form using its own name. If multiple subcontractors for any trade are proposed, Bidder may submit multiple copies of this form.

1. **PLUMBING CONTRACTOR:**

Description of Plumbing Work:

Eastern Plumbing (MC)  
(Print Name)

Plumbing (MC)

Agreed amount to be paid Subcontractor: \$178,000-  
(MC)

2. **HVAC CONTRACTOR:**

Description of HVAC Work:

ACS Systems  
(Print Name)

HVAC

Agreed amount to be paid Subcontractor: \$347,000

3. **ELECTRICAL CONTRACTOR:**

Description of Electrical Work:

Tru-Val Electric  
(Print Name)

Electrical work

Agreed amount to be paid Subcontractor: \$1,373,000

**BIDDER'S SIGNATURE:** The Bidder must sign and complete this form in the spaces provided below:

MMW (WP)  
(Bidder's Signature)

Mark Canellos  
(Print Name)

National Environmental Safety Co Inc 12-17 38<sup>th</sup> Ave, LIC, NY 11101  
(Address)

Vice President (718) 361-0044 (718) 361-0846 Oct. 16<sup>th</sup> 2015  
(Title) (Phone #) (Fax#) (Date)

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

**BID FOR FURNISHING ALL LABOR AND  
MATERIAL NECESSARY AND REQUIRED FOR:**

**PROJECT ID: LQQ122EE2**

**East Elmhurst Branch Library Expansion  
95-08 Astoria Boulevard  
Queens 11369**

Name of Bidder: \_\_\_\_\_

Date of Bid Opening: \_\_\_\_\_

Bidder is: (Check one, whichever applies)    Individual ( )    Partnership ( )    Corporation ( )

Place of Business of Bidder: \_\_\_\_\_

Bidder's Telephone Number: \_\_\_\_\_ Bidder's Fax Number: \_\_\_\_\_

Bidder's Email Address: \_\_\_\_\_

Residence of Bidder (If Individual): \_\_\_\_\_

If Bidder is a Partnership, fill in the following blanks:

Names of Partners

Residence of Partners

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

If Bidder is a Corporation, fill in the following blanks:

Organized under the laws of the State of \_\_\_\_\_

Name and Home Address of President: \_\_\_\_\_

\_\_\_\_\_

Name and Home Address of Secretary: \_\_\_\_\_

\_\_\_\_\_

Name and Home Address of Treasurer:

\_\_\_\_\_



**THIS PAGE INTENTIONALLY LEFT BLANK**

## BID FORM

The above-named 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 set forth on the Affirmation included as page 17 of this Bid Booklet.

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

5. 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).

6. 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.

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.

7. 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.

8. 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.

9. 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:

10. **M/WBE UTILIZATION PLAN:** By signing its bid, the bidder agrees to the Vendor Certification and Required Affirmations set forth below, unless a full waiver of the Participation Goals is granted. The Vendor Certification and Required Affirmations will be deemed to satisfy the requirement to complete Section V of Part II of Schedule B: M/WBE Utilization Plan.

**Section V: Vendor Certification and Required Affirmations:**

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
- 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 firm

**BID FORM**

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**PROJECT ID: LQQ12EE2**

**TOTAL BID PRICE:** In the space provided below, the Bidder shall indicate the total bid price in figures.

- A. **LUMP SUM PRICE** - Total price for all labor and material for all required work, excluding items (B), (C) and (D) set forth below. Total Price shall include all costs and expenses, i.e. labor, material overhead and profit for all the Work, described and shown in the drawings and specifications.

Total Price for  
Material Sold and  
Delivered

Total Price For  
Labor

\$ \_\_\_\_\_ + \$ \_\_\_\_\_ Total Price for Item A= \$ \_\_\_\_\_

- B. ALLOWANCE for Incidental Asbestos Abatement (Section 028013 of the Specifications) \$15,000.00
- C. ALLOWANCE for Tree Restitution (Section 329300 of the Specifications) \$13,050.00
- D. AMOUNT for Proprietary Items (pages 2a-c) \$80,461.00
- TOTAL BID PRICE (Add A + B + C + D)  
( a/k/a BID PROPOSAL) \$ \_\_\_\_\_

**BIDDER'S SIGNATURE AND AFFIDAVIT**

- \* **SUBCONTRACTOR IDENTIFICATION:** You MUST complete and submit the form entitled "Bidder's Identification of Subcontractors" (page 17) at the time you submit your bid. You must submit this form in a separate, sealed envelope (BID ENVELOPE #2). In the event an award of contract is not made to the Bidder, the Bidder hereby authorizes the Agency to shred the form entitled "Bidder's Identification of Subcontractors". \_\_\_\_\_ Yes \_\_\_\_\_ No

Bidder: \_\_\_\_\_

By: \_\_\_\_\_  
(Signature of Partner or corporate officer)

Attest: \_\_\_\_\_  
(Corporate Seal) Secretary of Corporate Bidder

Affidavit on the following page should be subscribed and sworn to before a Notary Public

**THIS PAGE INTENTIONALLY LEFT BLANK**

**BID FORM (TO BE NOTARIZED)**

\*\*\*\*\*

AFFIDAVIT WHERE BIDDERS IS AN INDIVIDUAL

STATE OF NEW YORK, COUNTY OF \_\_\_\_\_ ss:

\_\_\_\_\_ being duly sworn says:

I am the person described in and who executed the foregoing bid, and the several matters therein stated are in all respects true.

\_\_\_\_\_  
(Signature of the person who signed the Bid)

Subscribed and sworn to before me this  
\_\_\_\_\_ day of \_\_\_\_\_,

\_\_\_\_\_  
Notary Public

\*\*\*\*\*

AFFIDAVIT WHERE BIDDERS IS A PARTNERSHIP

STATE OF NEW YORK, COUNTY OF \_\_\_\_\_ ss:

\_\_\_\_\_ being duly sworn says:

I am a member of \_\_\_\_\_ the firm described in and which executed the foregoing bid. subscribed the name of the firm thereto on behalf of the firm, and the several matters therein stated are in all respects true.

\_\_\_\_\_  
(Signature of Partner who signed the Bid)

Subscribed and sworn to before me this  
\_\_\_\_\_ day of \_\_\_\_\_,

\_\_\_\_\_  
Notary Public

\*\*\*\*\*

AFFIDAVIT WHERE BIDDERS IS A CORPORATION

STATE OF NEW YORK, COUNTY OF \_\_\_\_\_ ss:

\_\_\_\_\_ being duly sworn says:

I am the \_\_\_\_\_ of the above named corporation whose name is subscribed to and which executed the foregoing bid. I reside at \_\_\_\_\_  
I have knowledge of the several matters therein stated, and they are in all respects true.

\_\_\_\_\_  
(Signature of Corporate Officer who signed the Bid)

Subscribed and sworn to before me this  
\_\_\_\_\_ day of \_\_\_\_\_,

\_\_\_\_\_  
Notary Public

**AFFIRMATION**

The undersigned bidder affirms and declares that said bidder is not in arrears to the City of New York upon debt contract or taxes and is not a defaulter, as surety or otherwise, upon obligation to the City of New York, and has not been declared not responsible, or disqualified, by any agency of the City of New York, nor is there any proceeding pending relating to the responsibility or qualification of the bidder to receive public contracts except \_\_\_\_\_

\_\_\_\_\_  
(If none, the bidder shall insert the word "None" in the space provided above.)

Full Name of Bidder: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

**CHECK ONE BOX AND INCLUDE APPROPRIATE NUMBER:**

A - Individual or Sole Proprietorship \*  
SOCIAL SECURITY NUMBER

-----

B - Partnership, Joint Venture or other unincorporated organization  
EMPLOYER IDENTIFICATION NUMBER

-----

C - Corporation  
EMPLOYER IDENTIFICATION NUMBER

-----

By: \_\_\_\_\_  
Signature:

Title: \_\_\_\_\_

If a corporation, place seal here

This affirmation must be signed by an officer or duly authorized representative.

\* Under the Federal Privacy Act the furnishing of Social Security Numbers by bidders on City contracts is voluntary. Failure to provide a Social Security Number will not result in a bidder's disqualification. Social Security Numbers will be used to identify bidders, proposers or vendors to ensure their compliance with laws, to assist the City in enforcement of laws, as well as to provide the City a means of identifying of businesses which seek City contracts.

# BIDDER'S IDENTIFICATION OF SUBCONTRACTORS

## NOTICE TO BIDDERS

**SUBMISSION:** The Bidder must, at the time of the bid, submit the completed form on the next page ("BIDDER'S IDENTIFICATION OF SUBCONTRACTORS"). This form must be submitted in a separate, sealed envelope (BID ENVELOPE #2). Failure to do so will result in the disqualification of the bid as non-responsive.

\*\*\*\*\*

Please be advised that pursuant to GML § 101(5) the Bidder is required to submit with its bid the names of subcontractors it intends to use to perform the following work on this contract, as well as the agreed-upon amount to be paid to each:

- plumbing and gas fitting;
- steam heating, hot water heating, ventilating and air conditioning apparatus; and
- electric wiring and standard illuminating fixtures.

**NOTE:** This project may not involve all of the above listed subcontractors. Please see the form on the next page which indicates the subcontractors required for this Project.

All listed subcontractors must be used to perform the work identified on this form for the amount listed. The listed subcontractors are not alternatives to each other. The list of subcontractors is to be submitted in a separate sealed envelope by completing the form 'Bidders Identification of Subcontractors' for any subcontractors intended to be used in any of the three trades listed above. If bidder intends to use its own forces for any of the above listed work, bidder should complete this form using its own name.

**Failure to submit the completed form on the next page ("Bidder's Identification of Subcontractors") that includes the names of subcontractors and the agreed upon amounts to be paid to such subcontractors will render the bid non-responsive.**

PLEASE NOTE: for any contract that is subject to M/WBE Participation Goals under Local Law 129, if the bidder's intention to use its own forces to do any of the above-referenced work would result in Bidder's failure to attain the Target Subcontracting Percentage identified in Schedule B (Subcontractor Utilization Plan), the bid will be non-responsive unless the bidder requests and obtains a Waiver of Target Subcontracting Percentage (Schedule B, Part III) in advance of bid submission. Failure to submit the completed 'BIDDERS IDENTIFICATION OF SUBCONTRACTORS' form that includes the names of subcontractors and the agreed upon amounts to be paid to such subcontractors will render the bid non-responsive.

After the low bid is announced, the sealed list submitted by the low bidder will be opened and the names of the subcontractors will be announced. The sealed lists of subcontractors submitted by all other bidders shall be maintained by the Agency unopened unless such bidder shall become the low bidder (e.g., the initial low bidder is found non-responsive). All unopened lists of subcontractors shall be returned to the bidders unopened after contract award, unless the bidder has given the agency permission to shred the form.

After bid submission, any change of subcontractor or agreed-upon amount to be paid to each shall require approval of the Agency upon a showing of a legitimate construction need which shall include, but not be limited to, a change in project specifications, a change in project material costs, a change to subcontractor status as determined pursuant to §222 (2)(e) of the Labor Law, or if the subcontractor has become otherwise unwilling, unable or unavailable to perform the subcontract.



**BIDDER'S IDENTIFICATION OF SUBCONTRACTORS**

Project ID: LQQ122EE2

**SUBMISSION:** In addition to its Bid (Bid Envelope # 1), the Bidder must, at the time of the bid, complete and submit this form a separate, sealed envelope (Bid Envelope # 2). To complete this form, the Bidder must identify the subcontractors it intends to use for the work listed below, as well as the dollar amount to be paid to each subcontractor. Failure to complete this form and submit it in a separate, sealed envelope will result in the disqualification of the bid as non-responsive.

The Bidder intends to use the following subcontractors. If the Bidder intends to do any of the work referenced below with its own forces, the Bidder should complete this form using its own name. If multiple subcontractors for any trade are proposed, Bidder may submit multiple copies of this form.

1. **PLUMBING CONTRACTOR:**

Description of Plumbing Work:

\_\_\_\_\_  
(Print Name)

\_\_\_\_\_

Agreed amount to be paid Subcontractor: \$ \_\_\_\_\_

\_\_\_\_\_

2. **HVAC CONTRACTOR:**

Description of HVAC Work:

\_\_\_\_\_  
(Print Name)

\_\_\_\_\_

Agreed amount to be paid Subcontractor: \$ \_\_\_\_\_

\_\_\_\_\_

3. **ELECTRICAL CONTRACTOR:**

Description of Electrical Work:

\_\_\_\_\_  
(Print Name)

\_\_\_\_\_

Agreed amount to be paid Subcontractor: \$ \_\_\_\_\_

\_\_\_\_\_

**BIDDER'S SIGNATURE:** The Bidder must sign and complete this form in the spaces provided below:

\_\_\_\_\_  
(Bidder's Signature) (Print Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Title) (Phone #) (Fax#) (Date)

NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
<b>CONTRACT 1 - GENERAL CONSTRUCTION Work</b>								
010000	General Requirement	1	LS	25,000.00	25,000.00	200,000.00	200,000.00	225,000.00
010000	General Requirement							
	Leed requirement	1	LS	10,000.00	10,000.00	20,000.00	20,000.00	30,000.00
	Commissioning (including VAV roof top AHU (RTU -1), Variable air volume terminal boxes with electrical heat VAV - 1 to 4), Fan units (F-1/2). Hot water circulator, New electrical power distribution and lighting system)	1	LS	15,000.00	15,000.00	25,000.00	25,000.00	40,000.00
	Mobilization (including site survey of material delivery and work conditions, Delivery of on site equipment and tools, Set up of material storage areas and security of materials, Plan for security of materials)	1	LS	50,000.00	50,000.00	100,000.00	100,000.00	150,000.00
	Demobilization (including removal of on site equipment and tools, removal of storage areas, subcontractor clean up of storage areas)	1	LS	15,000.00	15,000.00	50,000.00	50,000.00	65,000.00
	Temporary Protection							
	Trees	2	EA	100.00	200.00	400.00	800.00	1,000.00
	Columns	2	EA	50.00	100.00	300.00	600.00	700.00
	Temporary barriers, sheet vinyl, typical, install and remove							
	Exterior	2,484	SF	5.00	12,420.00	15.00	37,260.00	49,680.00
	Interior	1,260	SF	5.00	6,300.00	15.00	18,900.00	25,200.00
	Construction fence, plywood/chainlink	2,220	SF	5.00	11,100.00	15.00	33,300.00	44,400.00
	Doors at temporary barriers, install and remove	2	EA	1,500.00	3,000.00	3,500.00	7,000.00	10,000.00
	Temporary facilities	1	LS	10,000.00	10,000.00	25,000.00	25,000.00	35,000.00
	Security guards	1	LS	0.00	0.00	200,000.00	200,000.00	200,000.00
	<b>Subtotal</b>				<b>158,120.00</b>		<b>717,860.00</b>	<b>875,980.00</b>

NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
020000	Existing Conditions							
024119	Selective Demolition							
	Site Demolition							
	Cleaning including removal of shrubs and vegetation	1,000	SF	1.00	1,000.00	4.00	4,000.00	5,000.00
	Grubbing including removal of stumps, buried logs, roots larger than 2", matted roots and organic materials	200	SF	3.00	600.00	6.00	1,200.00	1,800.00
	Trees, sectional felling 4"	10	EA	6.00	60.00	30.00	300.00	360.00
	Trees, sectional felling 6"	8	EA	8.00	64.00	40.00	320.00	384.00
	Trees, sectional felling 8"	7	EA	12.00	84.00	50.00	350.00	434.00
	Trees, sectional felling 10"	6	EA	14.00	84.00	60.00	360.00	444.00
	Trees, sectional felling 12"	5	EA	16.00	80.00	70.00	350.00	430.00
	Trees, sectional felling 18"	4	EA	18.00	72.00	80.00	320.00	392.00
	Trees, sectional felling 24"	3	EA	20.00	60.00	90.00	270.00	330.00
	Stump chipping 4"	10	EA	6.00	60.00	30.00	300.00	360.00
	Stump chipping 6"	8	EA	8.00	64.00	40.00	320.00	384.00
	Stump chipping 8"	7	EA	10.00	70.00	50.00	350.00	420.00
	Stump chipping 10"	6	EA	12.00	72.00	60.00	360.00	432.00
	Stump chipping 12"	5	EA	14.00	70.00	70.00	350.00	420.00
	Stump chipping 18"	4	EA	16.00	64.00	80.00	320.00	384.00
	Stump chipping 24"	3	EA	18.00	54.00	90.00	270.00	324.00
	Pavement	100	SF	2.00	200.00	8.00	800.00	1,000.00
	Curb	34	LF	10.00	340.00	30.00	1,020.00	1,360.00
	Sidewalk: Sawcut	571	LF	2.00	1,142.00	10.00	5,710.00	6,852.00
	Sidewalk: Breakup	5,621	SF	2.00	11,242.00	10.00	56,210.00	67,452.00
	Fence	273	LF	5.00	1,365.00	20.00	5,460.00	6,825.00
	Flagpole, demolish	1	EA	100.00	100.00	600.00	600.00	700.00
	Bike rack, salvage	5	EA	25.00	125.00	150.00	750.00	875.00
	Phone booth	1	EA	25.00	25.00	250.00	250.00	275.00
	Sign	1	EA	25.00	25.00	200.00	200.00	225.00
	House trap	1	EA	25.00	25.00	250.00	250.00	275.00

NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
	Area drain	1	EA	25.00	25.00	250.00	250.00	275.00
	Exterior Demolition:							
	General demo	1	LS	5,000.00	5,000.00	25,000.00	25,000.00	30,000.00
	Infill masonry	100	SF	50.00	5,000.00	250.00	25,000.00	30,000.00
	Existing brick veneer at main entry area, salvage	823	SF	7.00	5,761.00	18.00	14,814.00	20,575.00
	North windows	360	SF	5.00	1,800.00	10.00	3,600.00	5,400.00
	Front vestibule	96	SF	10.00	960.00	25.00	2,400.00	3,360.00
	Coping including gravel stop, pull back 12" of wp membrane	157	LF	5.00	785.00	10.00	1,570.00	2,355.00
	Interior Demolition:							
	Slab cutting	56	SF	2.00	112.00	15.00	840.00	952.00
	Floor channeling	100	LF	5.00	500.00	25.00	2,500.00	3,000.00
	Interior glass partitions	104	SF	3.00	312.00	13.00	1,352.00	1,664.00
	Partition at slab cutting	100	SF	5.00	500.00	15.00	1,500.00	2,000.00
	ACT for salvage	825	SF	2.00	1,650.00	5.00	4,125.00	5,775.00
	Existing RFID gates at main entry, salvage	2	EA	100.00	200.00	600.00	1,200.00	1,400.00
	Existing shelves for reuse	19	EA	100.00	1,900.00	250.00	4,750.00	6,650.00
	Existing signage pin letters	13	EA	1.00	13.00	5.00	65.00	78.00
	Existing signage: Queens Library banner	3	EA	10.00	30.00	200.00	600.00	630.00
	HVAC: Electric duct heater for relocation	2	EA	15.00	30.00	150.00	300.00	330.00
	HVAC: Miscellaneous	1	LS	2,000.00	2,000.00	5,000.00	5,000.00	7,000.00
	Light fixtures for salvage	4	EA	15.00	60.00	75.00	300.00	360.00
	Light fixtures for removal	5	EA	15.00	75.00	75.00	375.00	450.00
	Cap: Duplex receptacle	2	EA	5.00	10.00	30.00	60.00	70.00
	Cap: Power & data feeds to desks	2	EA	5.00	10.00	30.00	60.00	70.00
	Site Engineering:							
	Site drains	2	EA	15.00	30.00	200.00	400.00	430.00
	Storm pipe, remove and backfill	100	LF	10.00	1,000.00	75.00	7,500.00	8,500.00
	Cap	3	EA	25.00	75.00	100.00	300.00	375.00
	Abandon and plug 5" storm pipe	2	EA	25.00	50.00	100.00	200.00	250.00
	Miscellaneous (including general protection and dust control)	1	LS	2,000.00	2,000.00	5,000.00	5,000.00	7,000.00

NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
	Disposal including handling, loading, hauling and dumping charge	1	LS	3,000.00	3,000.00	6,000.00	6,000.00	9,000.00
	Diversion	1	LS	1,000.00	1,000.00	2,500.00	2,500.00	3,500.00
	<b>Subtotal</b>				<b>51,035.00</b>		<b>198,551.00</b>	<b>249,586.00</b>
028213	Asbestos Abatement							
	Asbestos abatement (50 LF pipe insulation and 150 SF floor mastic)	1	LS	10,000.00	10,000.00	40,000.00	40,000.00	50,000.00
	<b>Subtotal</b>				<b>10,000.00</b>		<b>40,000.00</b>	<b>50,000.00</b>
030000	Concrete							
030000	Cast- In - Place Concrete							
	Continous foundation wall	33	CY	250.00	8,250.00	1,250.00	41,250.00	49,500.00
	Planter wall	4.0	CY	250.00	1,000.00	1,250.00	5,000.00	6,000.00
	Gread beams							
	GB - 1	51	CY	250.00	12,750.00	1,250.00	63,750.00	76,500.00
	GB - 2	7	CY	250.00	1,750.00	1,250.00	8,750.00	10,500.00
	GB - 3	7	CY	250.00	1,750.00	1,250.00	8,750.00	10,500.00
	GB - 4	1	CY	250.00	250.00	1,250.00	1,250.00	1,500.00
	Pile Caps							
	PC - 1	7	CY	250.00	1,750.00	1,250.00	8,750.00	10,500.00
	PC - 2	7	CY	250.00	1,750.00	1,250.00	8,750.00	10,500.00
	PC - 3	2	CY	250.00	500.00	1,250.00	2,500.00	3,000.00
	Sleeves, link - lock type, typical							
	3"	4	EA	50.00	200.00	250.00	1,000.00	1,200.00
	6"	3	EA	75.00	225.00	300.00	900.00	1,125.00

NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
	10"	3	EA	100.00	300.00	350.00	1,050.00	1,350.00
	Concrete curb with steel edging	34	LF	100.00	3,400.00	100.00	3,400.00	6,800.00
	<b>Subtotal</b>				<b>33,875.00</b>		<b>155,100.00</b>	<b>188,975.00</b>
035300	Concrete Floor Topping							
	Slab on grade:							
	Notch foundation wall 4"	100	LF	5.00	500.00	35.00	3,500.00	4,000.00
	Notch foundation wall 6"	79	LF	5.00	395.00	45.00	3,555.00	3,950.00
	Slab restoration	300	SF	3.00	900.00	13.00	3,900.00	4,800.00
	Patch floor channel	100	LF	15.00	1,500.00	65.00	6,500.00	8,000.00
	2 way 8" floor slab (3,445 SF)	86	CY	225.00	19,350.00	1,000.00	86,000.00	105,350.00
	2 way 12" floor slab (300 SF)	11	CY	225.00	2,475.00	1,000.00	11,000.00	13,475.00
	5" including microfiber reinforcement, exterior (1,178 SF)	19	CY	225.00	4,275.00	850.00	16,150.00	20,425.00
	6" planter (95 SF)	2	CY	225.00	450.00	850.00	1,700.00	2,150.00
	Sawcut joint 6' oc	200	LF	2.00	400.00	8.00	1,600.00	2,000.00
	Ramp slab and supports (224 SF)	4	CY	0.00	0.00	0.00	0.00	0.00
	stair slab (8" thick)	1	CY	0.00	0.00	0.00	0.00	0.00
	Interior stairs	15	LFR	0.00	0.00	0.00	0.00	0.00
	Crushed gravel with steel edges	200	SF	0.00	0.00	0.00	0.00	0.00
	Curbs, slab elevations and depressions	1	LS	0.00	0.00	0.00	0.00	0.00
	<b>Subtotal</b>				<b>30,245.00</b>		<b>133,905.00</b>	<b>164,150.00</b>
040000	Masonry							
042000	Masonry Assemblies							
	Exterior Masonry:							
	12" CMU bearing wall solid grout	1,568	SF	15.00	23,520.00	45.00	70,560.00	94,080.00
	Outdoor storage	320	SF	15.00	4,800.00	45.00	14,400.00	19,200.00
	Lot line wall 12" CMU bearing wall solid grout	688	SF	15.00	10,320.00	45.00	30,960.00	41,280.00
	Salvaged brick with backup	200	SF	20.00	4,000.00	65.00	13,000.00	17,000.00
	Interior Masonry:							

NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
	(1) 8" 2 HRS	960	SF	10.00	9,600.00	40.00	38,400.00	48,000.00
	(2) 8"	432	SF	10.00	4,320.00	40.00	17,280.00	21,600.00
	(3) 2 @ 4"	96	SF	14.00	1,344.00	50.00	4,800.00	6,144.00
	(4) 4"	192	SF	8.00	1,536.00	35.00	6,720.00	8,256.00
	(5A) 8"	1,056	SF	10.00	10,560.00	40.00	42,240.00	52,800.00
	(5B) 8"	64	SF	10.00	640.00	40.00	2,560.00	3,200.00
	Scaffolding/work platforms	4,000	SF	2.50	10,000.00	4.00	16,000.00	26,000.00
	Coping	230	LF	35.00	8,050.00	50.00	11,500.00	19,550.00
	Stone: Interior saddle, granite flamed finish	2	EA	250.00	500.00	350.00	700.00	1,200.00
	<b>Subtotal</b>				<b>89,190.00</b>		<b>269,120.00</b>	<b>358,310.00</b>
050000	Metals							
051200	Structural Steel							
	Columns	17,438	LBS	4.00	69,752.00	4.00	69,752.00	139,504.00
	Beams and channels	43,516	LBS	4.00	174,064.00	4.00	174,064.00	348,128.00
	Angles, connections and plates	2,000	LBS	4.00	8,000.00	4.00	8,000.00	16,000.00
	Reinforcing steel:							
	Slab on grade	5,000	LBS	4.00	20,000.00	4.00	20,000.00	40,000.00
	Reinforcing bar supports	1	LS	2,000.00	2,000.00	5,000.00	5,000.00	7,000.00
	Welded wire fabric (WWF)	4,800	SF	2.00	9,600.00	3.00	14,400.00	24,000.00
	<b>Subtotal</b>				<b>283,416.00</b>		<b>291,216.00</b>	<b>574,632.00</b>
053100	Steel Decking							
	Roof deck, open type, wide rib, 20 GA, galvanized, typical, uon: 1-1/2" - 18 GA	4,800	SF	8.00	38,400.00	6.00	28,800.00	67,200.00
	Edge stop	525	LF	8.00	4,200.00	10.00	5,250.00	9,450.00
	<b>Subtotal</b>				<b>42,600.00</b>		<b>34,050.00</b>	<b>76,650.00</b>
054200	Light Gauge Structural Framing							
	(6x4x1/2) 15.62	3,000	LBS	4.00	12,000.00	4.00	12,000.00	24,000.00

NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
	Angle connections and plates	1,500	LBS	4.00	6,000.00	4.00	6,000.00	12,000.00
	Metal roof joist	4,000	LBS	4.00	16,000.00	4.00	16,000.00	32,000.00
	Lintels:							
	L 5 x 3 1/2 x 5/16"	50	LF	20.00	1,000.00	35.00	1,750.00	2,750.00
	L 6 x 3 1/2 x 5/16"	50	LF	25.00	1,250.00	35.00	1,750.00	3,000.00
	<b>Subtotal</b>				<b>36,250.00</b>		<b>37,500.00</b>	<b>73,750.00</b>
055000	Metal Fabrication							
	Thresholds							
	Double	12	EA	600.00	7,200.00	600.00	7,200.00	14,400.00
	Single	5	EA	300.00	1,500.00	300.00	1,500.00	3,000.00
	Aluminum fascia at roof edge, complete	525	LF	20.00	10,500.00	40.00	21,000.00	31,500.00
	Aluminum fascia at meeting room soffit	80	LF	20.00	1,600.00	40.00	3,200.00	4,800.00
	Aluminum sheathing at outdoor storage walls	440	SF	10.00	4,400.00	25.00	11,000.00	15,400.00
	Hand rails, pipe rails:							
	Painted steel welded at interior court stair	14	LF	50.00	700.00	50.00	700.00	1,400.00
	Metal guardrail and associated barrier assembly	39	LF	200.00	7,800.00	150.00	5,850.00	13,650.00
	<b>Subtotal</b>				<b>33,700.00</b>		<b>50,450.00</b>	<b>84,150.00</b>
057000	Decorative Metal							
	Coat rack with shelf	20	LF	20.00	400.00	15.00	300.00	700.00
	Bearing plates and connectors, loose lintels and miscellaneous anchorage devices	1	LS	1,500.00	1,500.00	4,000.00	4,000.00	5,500.00
	Miscellaneous metals including partition and ceiling supports, door lintel (uon), shelf angles, mortar supports, door supports	1	LS	2,000.00	2,000.00	5,000.00	5,000.00	7,000.00
	<b>Subtotal</b>				<b>3,900.00</b>		<b>9,300.00</b>	<b>13,200.00</b>
060000	Wood, Plastics and Composites							
062000	Carpentry							
	Rough carpentry	1	LS	5,000.00	5,000.00	10,000.00	10,000.00	15,000.00



NYC DEPT OF DESIGN+CONSTRUCTION

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CONTRACT 1-GENERAL CONST.

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CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
	Electrical, data and telephone backboards	50	SF	50.00	2,500.00	50.00	2,500.00	5,000.00
	Install bike rack	5	EA	25.00	125.00	150.00	750.00	875.00
	Wardrobe & closet specialties, door hooks	10	EA	25.00	250.00	75.00	750.00	1,000.00
	<b>Subtotal</b>				<b>7,875.00</b>		<b>14,000.00</b>	<b>21,875.00</b>
064000	Architectural Wood Work							
	Wood benches:							
	1.0	8	EA	1,000.00	8,000.00	750.00	6,000.00	14,000.00
	1.5	1	EA	1,200.00	1,200.00	750.00	750.00	1,950.00
	6" x 48" deep concrete piers	18	EA	30.00	540.00	150.00	2,700.00	3,240.00
	Hardwood benches:							
	1.25	8	EA	1,000.00	8,000.00	750.00	6,000.00	14,000.00
	1.75	1	EA	1,200.00	1,200.00	750.00	750.00	1,950.00
	Steel supports	18	EA	30.00	540.00	50.00	900.00	1,440.00
	Cabinets:							
	Base cabinet (kitchen/pantry)	6	LF	400.00	2,400.00	100.00	600.00	3,000.00
	Wall upper cabinet (kitchen/pantry)	6	LF	300.00	1,800.00	100.00	600.00	2,400.00
	Counters:							
	Computer room counter	35	LF	400.00	14,000.00	100.00	3,500.00	17,500.00
	Pantry	6	LF	400.00	2,400.00	100.00	600.00	3,000.00
	Sink cuts	1	EA	100.00	100.00	300.00	300.00	400.00
	Banquette:							
	Young adult room	55	LF	450.00	24,750.00	150.00	8,250.00	33,000.00
	Fabric-wrapped foam cushions	55	LF	100.00	5,500.00	100.00	5,500.00	11,000.00
	Screen panels perforated hardwood veneer plywood	165	SF	10.00	1,650.00	15.00	2,475.00	4,125.00
	Relocate bookshelves	14	EA	50.00	700.00	300.00	4,200.00	4,900.00
	Clothes rod	12	LF	5.00	60.00	10.00	120.00	180.00
	Blocking	50	LF	5.00	250.00	10.00	500.00	750.00

NYC DEPT OF DESIGN+CONSTRUCTION

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CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

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CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
	Blocking and grounding for freestanding shelving by others	100	LF	5.00	500.00	10.00	1,000.00	1,500.00
	<b>Subtotal</b>				<b>73,590.00</b>		<b>44,745.00</b>	<b>118,335.00</b>
070000	Thermal and Moisture Protection							
071326	Sheet Membrane Waterproofing							
	Vertical and subgrade	2,100	SF	5.00	10,500.00	15.00	31,500.00	42,000.00
	Planters	255	SF	5.00	1,275.00	15.00	3,825.00	5,100.00
	Membrane outdoor storage walls	440	SF	5.00	2,200.00	15.00	6,600.00	8,800.00
	<b>Subtotal</b>				<b>13,975.00</b>		<b>41,925.00</b>	<b>55,900.00</b>
072100	Thermal Protection							
	Foundation	2,100	SF	5.00	10,500.00	5.00	10,500.00	21,000.00
	Walls:							
	Rigid	4,000	SF	0.00	0.00	0.00	0.00	0.00
	Batt	2,000	SF	0.00	0.00	0.00	0.00	0.00
	Roofs:							
	Rigid	4,800	SF	5.00	24,000.00	5.00	24,000.00	48,000.00
	Rigid and Batt	4,000	SF	7.00	28,000.00	7.00	28,000.00	56,000.00
	<b>Subtotal</b>				<b>62,500.00</b>		<b>62,500.00</b>	<b>125,000.00</b>
072713	Modified Bituminous Sheet Air Barrier							
	Vapor barrier, wrap:							
	Exterior wall	400	SF	2.00	800.00	5.00	2,000.00	2,800.00
	Roof	4,800	SF	2.00	9,600.00	5.00	24,000.00	33,600.00
	<b>Subtotal</b>				<b>10,400.00</b>		<b>26,000.00</b>	<b>36,400.00</b>
074600	Siding							
	Aluminum corrugated panel with backup	230	SF	10.00	2,300.00	20.00	4,600.00	6,900.00
	Metal siding at interior	250	SF	10.00	2,500.00	20.00	5,000.00	7,500.00
	Fiber cement panel with backup	700	SF	6.00	4,200.00	10.00	7,000.00	11,200.00

NYC DEPT OF DESIGN+CONSTRUCTION

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				Unit Cost	Total Cost	Unit Cost	Total Cost	
	Fascia with backup	1,050	SF	15.00	15,750.00	30.00	31,500.00	47,250.00
	Aluminum channels, sign	30	SF	15.00	450.00	30.00	900.00	1,350.00
	Aluminum plate	54	SF	15.00	810.00	30.00	1,620.00	2,430.00
	<b>Subtotal</b>				<b>26,010.00</b>		<b>50,620.00</b>	<b>76,630.00</b>
075200	<b>Modified Bituminous Membrane Roofing</b>							
	SBS modified bitumen roof, 2 ply	4,800	SF	4.00	19,200.00	8.00	38,400.00	57,600.00
	Ballast/mechanical attachment	4,800	SF	2.00	9,600.00	6.00	28,800.00	38,400.00
	Roof accessories	1	LS	5,000.00	5,000.00	10,000.00	10,000.00	15,000.00
	Roofing at vertical surface	500	SF	5.00	2,500.00	10.00	5,000.00	7,500.00
	<b>Subtotal</b>				<b>36,300.00</b>		<b>82,200.00</b>	<b>118,500.00</b>
076200	<b>Flashing and Sheet Metal</b>							
	Flashing	600	LF	6.00	3,600.00	20.00	12,000.00	15,600.00
	Landscape edging, 18"	120	LF	15.00	1,800.00	25.00	3,000.00	4,800.00
	SS angle anchored at paving edge:							
	2 x 2 x 1/4	70	LF	5.00	350.00	10.00	700.00	1,050.00
	3 x 3 x 1/8	50	LF	6.00	300.00	12.00	600.00	900.00
	Downspout cover	3	EA	250.00	750.00	250.00	750.00	1,500.00
	<b>Subtotal</b>				<b>6,800.00</b>		<b>17,050.00</b>	<b>23,850.00</b>
078413	<b>Firestopping</b>							
	Seperation	500	LF	5.00	2,500.00	10.00	5,000.00	7,500.00
	<b>Subtotal</b>				<b>2,500.00</b>		<b>5,000.00</b>	<b>7,500.00</b>
079000	<b>Joint Sealants</b>							
	Caulk masonry exterior wall	100	SF	10.00	1,000.00	50.00	5,000.00	6,000.00
	Miscellaneous caulking and sealing	1	LS	1,000.00	1,000.00	3,000.00	3,000.00	4,000.00
	<b>Subtotal</b>				<b>2,000.00</b>		<b>8,000.00</b>	<b>10,000.00</b>

NYC DEPT OF DESIGN+CONSTRUCTION

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CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

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CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
080000	Opening							
081113	Steel Doors and Frames							
	A (HM)	1	EA	1,500.00	1,500.00	3,500.00	3,500.00	5,000.00
	B (AL3):							
	1	1	EA	1,500.00	1,500.00	3,500.00	3,500.00	5,000.00
	2	4	PR	2,500.00	10,000.00	4,500.00	18,000.00	28,000.00
	C (AL3)	6	EA	1,200.00	7,200.00	3,000.00	18,000.00	25,200.00
	F (AL3)	1	EA	1,200.00	1,200.00	3,000.00	3,000.00	4,200.00
	G (HM)	3	EA	1,500.00	4,500.00	3,500.00	10,500.00	15,000.00
	H (HM)	2	PR	2,500.00	5,000.00	4,500.00	9,000.00	14,000.00
	<b>Subtotal</b>				<b>30,900.00</b>		<b>65,500.00</b>	<b>96,400.00</b>
081400	Wood Doors							
	D (WD2)	7	PR	1,500.00	10,500.00	2,500.00	17,500.00	28,000.00
	E (WD1/WD2)	1	PR	1,500.00	1,500.00	2,500.00	2,500.00	4,000.00
	J (WD2)	1	EA	800.00	800.00	1,700.00	1,700.00	2,500.00
	<b>Subtotal</b>				<b>12,800.00</b>		<b>21,700.00</b>	<b>34,500.00</b>
083100	Access Doors and Panels							
	Valve access	3	EA	100.00	300.00	2,000.00	6,000.00	6,300.00
	<b>Subtotal</b>				<b>300.00</b>		<b>6,000.00</b>	<b>6,300.00</b>
084100	Aluminum Entrance and Storefront							
	Storefront/interior glass	750	SF	125.00	93,750.00	125.00	93,750.00	187,500.00
	<b>Subtotal</b>				<b>93,750.00</b>		<b>93,750.00</b>	<b>187,500.00</b>
084413	Glazed Aluminum Curtain Walls							
	Curtainwall	1,700	SF	125.00	212,500.00	125.00	212,500.00	425,000.00

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				Unit Cost	Total Cost	Unit Cost	Total Cost	
085100	Aluminum Windows							
	Fixed window with privacy insulation glass	4	SF	150.00	600.00	150.00	600.00	1,200.00
	Operable windows, motorized	50	SF	150.00	7,500.00	150.00	7,500.00	15,000.00
	<b>Subtotal</b>				<b>220,600.00</b>		<b>220,600.00</b>	<b>441,200.00</b>
086310	Polycarbonate-Insulating Panel Skylight							
	Main entry skylight	154	SF	75.00	11,550.00	50.00	7,700.00	19,250.00
	Young adult skylight	108	SF	75.00	8,100.00	50.00	5,400.00	13,500.00
	Interior court skylight	592	SF	75.00	44,400.00	50.00	29,600.00	74,000.00
	Interior court laylight	592	SF	15.00	8,880.00	15.00	8,880.00	17,760.00
	<b>Subtotal</b>				<b>72,930.00</b>		<b>51,580.00</b>	<b>124,510.00</b>
087100	Finish Hardware							
	Mortise Lockers	40	EA			150.00	6,000.00	14,814.00
	Keyed Cylinders	40	EA			150.00	6,000.00	3,600.00
	Exit devices and Trim	40	EA			150.00	6,000.00	2,400.00
	Electric Strikes	40	EA			100.00	4,000.00	1,570.00
	<b>Subtotal</b>						<b>22,000.00</b>	<b>22,384.00</b>
088000	Glazing							
	Interior system butt glazed	1,200	SF	20.00	24,000.00	20.00	24,000.00	48,000.00
	<b>Subtotal</b>				<b>24,000.00</b>		<b>24,000.00</b>	<b>48,000.00</b>
089000	Louvers and Vents							
	192 x 48 with SS wms and 16" motorized dampers	1	EA	5,000.00	5,000.00	3,000.00	3,000.00	8,000.00
	48 x 40 wms and motorized dampers	1	EA	1,500.00	1,500.00	1,000.00	1,000.00	2,500.00
	Louvers covers:							
	Storm resistant	250	SF	20.00	5,000.00	10.00	2,500.00	7,500.00
	Consealed mullion narrow profile	250	SF	20.00	5,000.00	15.00	3,750.00	8,750.00
	<b>Subtotal</b>				<b>16,500.00</b>		<b>10,250.00</b>	<b>26,750.00</b>

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CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
090000	Finishes							
092900	Gypsum Board Assemblies							
	Partitions, including gwb, studs and runners, insulation, uon:							
	(5) GWB furred over existing masonry	1,056	SF	5.00	5,280.00	10.00	10,560.00	15,840.00
	(5B) GWB 1 side with stud	64	SF	5.00	320.00	10.00	640.00	960.00
	(6) GWB 2 layers each side, 2 hours	150	SF	8.00	1,200.00	16.00	2,400.00	3,600.00
	Accessories including beads	1	LS	500.00	500.00	500.00	500.00	1,000.00
	Ceilings:							
	(PT1) Gypsum board suspended, painted	3,000	SF	5.00	15,000.00	13.00	39,000.00	54,000.00
	(PT2) Gypsum board on metal furring channels, painted, moisture resistant	1,500	SF	5.00	7,500.00	13.00	19,500.00	27,000.00
	(WD1) Perforated hard wood veneer	1,084	SF	10.00	10,840.00	15.00	16,260.00	27,100.00
055800	Soffit: Gypsum board, painted	500	SF	8.00	4,000.00	20.00	10,000.00	14,000.00
	Light trough	100	LF	8.00	800.00	20.00	2,000.00	2,800.00
	<b>Subtotal</b>				<b>45,440.00</b>		<b>100,860.00</b>	<b>146,300.00</b>
093000	Ceramic Tile							
	Floor: (CT1) Non slip ceramic tile	270	SF	10.00	2,700.00	25.00	6,750.00	9,450.00
	Base: Ceramic	86	LF	5.00	430.00	10.00	860.00	1,290.00
	Wall: Ceramic, glazed, typical	300	SF	10.00	3,000.00	20.00	6,000.00	9,000.00
	<b>Subtotal</b>				<b>6,130.00</b>		<b>13,610.00</b>	<b>19,740.00</b>
095100	Acoustical Ceiling							
	ACT 2 x 2 typical:							
	Slotted grid high reflectance surface	600	SF	5.00	3,000.00	10.00	6,000.00	9,000.00
	Slotted grid mold/moisture resistant	300	SF	6.00	1,800.00	15.00	4,500.00	6,300.00
	Rehang salvaged							
	Ceiling tile revisions:							
	Construction barrier	500	SF	4.00	2,000.00	8.00	4,000.00	6,000.00
	Ceiling tile	300	SF	3.00	900.00	6.00	1,800.00	2,700.00
	<b>Subtotal</b>				<b>7,700.00</b>		<b>16,300.00</b>	<b>24,000.00</b>

NYC DEPT OF DESIGN+CONSTRUCTION

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				Unit Cost	Total Cost	Unit Cost	Total Cost	
096723	<b>Epoxy Resin Composition Flooring And Wall Coverings</b>							
	Floor: (EC) Epoxy resin composition	2,885	SF	6.00	17,310.00	15.00	43,275.00	60,585.00
	Wall:							
	(WD1) Perforated plywood panel	300	SF	10.00	3,000.00	10.00	3,000.00	6,000.00
	(WD2) Wood veneer on door	200	SF	10.00	2,000.00	10.00	2,000.00	4,000.00
	(WD3) Wood veneer mdf panel	150	SF	10.00	1,500.00	10.00	1,500.00	3,000.00
	(WD4) Wood veneer plywood panel	450	SF	10.00	4,500.00	10.00	4,500.00	9,000.00
	(WD5) Solid wood panel	350	SF	10.00	3,500.00	10.00	3,500.00	7,000.00
	(HS) Homosote panel on plywood	200	SF	10.00	2,000.00	10.00	2,000.00	4,000.00
	<b>Subtotal</b>				<b>33,810.00</b>		<b>59,775.00</b>	<b>93,585.00</b>
096800	<b>Carpeting</b>							
	Carpet tile	1,050	SF	5.00	5,250.00	7.00	7,350.00	12,600.00
	Replacement stock	100	SF	5.00	500.00	0.00	0.00	500.00
	<b>Subtotal</b>				<b>5,750.00</b>		<b>7,350.00</b>	<b>13,100.00</b>
099000	<b>Painting</b>							
	Masonry sealing	4,000	SF	1.00	4,000.00	5.00	20,000.00	24,000.00
	Wall: Paint, low voc, new walls and partitions	8,000	SF	0.50	4,000.00	2.50	20,000.00	24,000.00
	Base:							
	Resilient, 4" typical, strait profile at carprrt, coved profile at resilient floor, rubber	200	LF	3.00	600.00	7.00	1,400.00	2,000.00
	Replacement stock	20	LF	3.00	60.00	0.00	0.00	60.00
	Exposed metal decking	500	SF	1.00	500.00	5.00	2,500.00	3,000.00
	Metal siding at interior	300	SF	1.00	300.00	5.00	1,500.00	1,800.00
	Attic stock	3	CAN	60.00	180.00	0.00	0.00	180.00
	<b>Subtotal</b>				<b>9,640.00</b>		<b>45,400.00</b>	<b>55,040.00</b>

NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
100000	Specialties							
101400	Signage							
	Signs	1	LS	4,000.00	4,000.00	2,000.00	2,000.00	6,000.00
	<b>Subtotal</b>				<b>4,000.00</b>		<b>2,000.00</b>	<b>6,000.00</b>
102100	Floor Mounted Toilet Partition							
	Privacy partitions stainless steel, typical, uon, toilet floor supported							
	Standard	3	EA	1,200.00	3,600.00	800.00	2,400.00	6,000.00
	Handicapped	1	EA	1,200.00	1,200.00	800.00	800.00	2,000.00
	<b>Subtotal</b>				<b>4,800.00</b>		<b>3,200.00</b>	<b>8,000.00</b>
102226	Operable Partitions							
	Operable partitions: 45 stc	150	SF	50.00	7,500.00	50.00	7,500.00	15,000.00
	<b>Subtotal</b>				<b>7,500.00</b>		<b>7,500.00</b>	<b>15,000.00</b>
102330	Fire Extinguishers and Cabinets							
	Fire extinguishers, recessed aluminum Cabinet, typical	2	EA	650.00	1,300.00	650.00	1,300.00	2,600.00
	<b>Subtotal</b>				<b>1,300.00</b>		<b>1,300.00</b>	<b>2,600.00</b>
102800	Toilet Accessories							
	Mens	1	EA	500.00	500.00	700.00	700.00	1,200.00
	Womens	1	EA	500.00	500.00	700.00	700.00	1,200.00
	<b>Subtotal</b>				<b>1,000.00</b>		<b>1,400.00</b>	<b>2,400.00</b>
107500	Flagpoles							
	Flagpole	1	EA	3,500.00	3,500.00	5,000.00	5,000.00	8,500.00
	<b>Subtotal</b>				<b>3,500.00</b>		<b>5,000.00</b>	<b>8,500.00</b>



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CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
110000	Equipment							
113100	Appliances							
	Bottom freezer refrigerator	1	EA	1,000.00	1,000.00	400.00	400.00	1,400.00
	<b>Subtotal</b>				<b>1,000.00</b>		<b>400.00</b>	<b>1,400.00</b>
115200	Projection Screens							
	Manually operated recessed 6' x 10' projection screens	3	EA	5,000.00	15,000.00	2,000.00	6,000.00	21,000.00
	<b>Subtotal</b>				<b>15,000.00</b>		<b>6,000.00</b>	<b>21,000.00</b>
120000	Furnishings							
122400	Window Shades							
	Window shades	4	SF	10.00	40.00	10.00	40.00	80.00
	Window Shades, motorized	50	SF	20.00	1,000.00	20.00	1,000.00	2,000.00
	<b>Subtotal</b>				<b>1,040.00</b>		<b>1,040.00</b>	<b>2,080.00</b>
124814	Floor Mats and Frames							
	Stainless steel entrance mat	180	SF	125.00	22,500.00	50.00	9,000.00	31,500.00
	<b>Subtotal</b>				<b>22,500.00</b>		<b>9,000.00</b>	<b>31,500.00</b>
220000	Plumbing							
220500	Common Work Results for Plumbing							
	Pumps, gages, meters, thermometers		LS					
	Rigging, hoisting and scaffolding		LS					
	System sterilization and purity test		EA					
	Equipment piping including fittings		LS					
	<b>Subtotal</b>							
220523	General Duty Valves for Plumbing Piping							
	Fittings (clamps, elis, wyes, tees & couplings) and valves		LS					
	<b>Subtotal</b>							



NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

**CONTRACTOR'S BID BREAKDOWN FORM**

CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: East Elmhurst Branch Library Expansion  
 Location: 95-08 Astoria Boulevard, Queens, NY 11369  
 Bidder:

DDC ID: LQQ122EE2  
 Sponsor Agency: Queens Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
22 0529	HANGERS AND SUPPRTS FOR PLUMBING PIPING AND EQUIPMENT (included w/ Division 23 sections)							
22 0548	VIBRATION AND NOISE CONTROL (included w/ Division 23 sections)							
22 0553	IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT (included w/ Division 23 sections)							
22 0700	PLUMBING INSULATION							
	3/4"		LF					
	1"		LF					
	1 1/4"		LF					
	1 1/2"		LF					
	2 1/2"		LF					
	Subtotal							
22 0800	COMMISSIONING OF PLUMBING (included w/ other Division 22 sections)							
22 1116	DOMESTIC WATER PIPING							
	CW/HW/IR:							
	3/4"		LF					
	1"		LF					
	1 1/4"		LF					
	1 1/2"		LF					
	2 1/2"		LF					
	Vent:							
	1 1/2"		LF					
	2 1/2"		LF					



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CONTRACT 1 - GENERAL CONSTRUCTION WORK

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 Bidder:

DDC ID: LQQ122EE2  
 Sponsor Agency: Queens Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor			
	Sanitary/drainage:										
	2"		LF		↓		↓	↓			
	3"		LF								
	4"		LF								
	6"		LF								
	8"		LF								
	<b>Subtotal</b>										
22 1119	<b>DOMESTIC WATER PIPING SPECIALTIES (included w/ other Division 22 sections)</b>										
22 1316	<b>SANITARY WASTE AND VENT PIPING (included w/ other Division 22 sections)</b>										
22 1319	<b>SANITARY WASTE PIPING SPECIALTIES</b>										
	3" Floor drain		EA		↓		↓	↓			
	4" Floor drain		EA								
	<b>Subtotal</b>										
22 1413	<b>STORM DRAINAGE PIPING (included w/ other Division 22 sections)</b>										
22 1423	<b>STORM DRAINAGE PIPING SPECIALTIES</b>										
	3" Area drain		EA								
	Planter drains:										
	3"		EA		↓		↓	↓			
	4"		EA								
	Roof drains:										
	Existing roof drain to connect to new piping		EA								
	3"		EA								



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 Bidder:

DDC ID: LQQ122EE2

Sponsor Agency: Queens Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	4"		EA					
	<b>Subtotal</b>							
22 3300	<b>ELECTRIC DOMESTIC WATER HEATER ACCESSORIES</b> (included w/ Section 238200)							
22 4000	<b>PLUMBING FIXTURES</b>							
	Lavatories, including faucets and waste fittings:							
	Wall hung		EA					
	Pantry sink		EA					
	Urinal		EA					
	Water closets, floor mounted, dual flush, uon:							
	Standard		EA					
	ADA		EA					
	Hose bibs, cold water only, uon:							
	Exterior		EA					
	Interior for irrigation system		EA					
	Service:							
	Water tap		EA					
	Sanitary tap		EA					
	Storm tap		EA					
	Gas tap		EA					
	Equipment:							
	House trap		EA					
	2" rpz		EA					
	Hot water circulator		EA					
	Expansion tank		EA					
	<b>Subtotal</b>							
	<i>Grand Total</i>							
	<i>For plumbing</i>							
					77,875		144,625	222,500



NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

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**CONTRACTOR'S BID BREAKDOWN FORM**

CONTRACT 1 - GENERAL CONSTRUCTION WORK

DDC ID: LQQ122EE2

Sponsor Agency: Queens Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
<u>23 0000</u>	<b>HEATING, VENTILATING AND AIR CONDITIONING</b>							
23 0001	SUMMARY OF HVAC WORK (included w/ other Division 23 sections)							
23 0500	COMMON WORK RESULTS FOR HVAC Rigging, hoisting and scaffolding		LS					
	<b>Subtotal</b>							
23 0513	COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT (included w/ Division 26 sections)							
23 0529	HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT General supports Manufactured curb		LS LF					
	<b>Subtotal</b>							
23 0548	VIBRATION CONTROL FOR HVAC Vibration isolation		LS					
	<b>Subtotal</b>							
23 0553	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT (included w/ other Division 23 sections)							
23 0593	TESTING, ADJUSTING AND BALANCING Testing and adjusting Balancing		HRS HRS					
	<b>Subtotal</b>							



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CONTRACT 1 - GENERAL CONSTRUCTION WORK

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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
23 0700	<b>HVAC INSULATION</b> Insulation, blanket type, typical		SF					
	<b>Subtotal</b>							
23 0800	<b>COMMISSIONING OF MECHANICAL SYSTEMS</b> Commissioning Code compliance test		HRS EA					
	<b>Subtotal</b>							
23 0993	<b>TEMPERATURE CONTROL FOR HVAC</b> Controls: Building management system Thermostats: Room CO2 Switch Outdoor Sensors: Occupancy Rain		EA EA EA EA EA EA EA					
	<b>Subtotal</b>							
23 1123	<b>FACILITY NATURAL GAS PIPING</b> 1 1/4" 2" Fittings and valves		LF LF LS					
	<b>Subtotal</b>							
23 3113	<b>METAL DUCTS</b> Ductwork rectangular, galvanized, uon Ductwork rectangular, galvanized, uon: fittings		LBS LBS					



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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	Ductwork circular, galvanized, uon		LBS		↓		↓	↓
	Ductwork circular, galvanized, uon: fittings		LBS					
	<b>Subtotal</b>							
<b>23 3300</b>	<b>AIR DUCT ACCESSORIES</b>							
	Dampers:							
	Volume 160 si, typical		EA					
	Motorized		EA					
	<b>Subtotal</b>							
<b>23 3416</b>	<b>HVAC FANS</b>							
	Exhaust fans:							
	(F-1) Toilet		EA					
	(F-2) Pantry		EA					
	<b>Subtotal</b>							
<b>23 3600</b>	<b>AIR TERMINAL UNITS</b>							
	VAV-1		EA					
	VAV-2		EA					
	VAV-3		EA					
	VAV-4		EA					
	Piping		LF					
	<b>Subtotal</b>							
<b>23 3713</b>	<b>DIFFUSERS, REGISTERS AND GRILLES</b>							
	(LS-1) 2.5" slot		EA					
	(LS-2) 2" slot		EA					
	24 x 12 ra grille w/md		EA					
	54 x 8 sa grille double deflection w/fd w/ad		EA					



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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	18 x 4 linear bar supply grille		EA		↓		↓	↓
	(CG-1) 24x24		EA					
	(CG-2) 24x24		EA					
	2" ra slot 12'		EA					
	6 x 6 exhaust		EA					
	192 x 36 removable grille interior		EA					
	48 x 40 removable grille interior		EA					
	22 x 12 wms		EA					
	24 x 12 wms		EA					
	24 x 16 wms		EA					
	30 x 16 wms		EA					
	Ceiling revision		EA					
	<b>Subtotal</b>							
23 4100	<b>NOISE CONTROL</b>							
	Sound attenuators:							
	(ST-1) 540		EA					
	(ST-2) 616		EA					
	<b>Subtotal</b>							
23 7432	<b>PACKAGED ROOFTOP AC UNIT</b>							
	RTU-1 (4900 cfm)		EA					
	Crane		EA					
	Electric connections		LS					
	Natural gas, piping connections		LS					
	<b>Subtotal</b>							
23 8200	<b>ELECTRIC HEATING TERMINAL UNITS</b>							
	Electric wall cabinet heaters:							
	(EH-1) 1.5KW		EA					





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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	(EH-2) 3KW Relocate existing electric duct heater		EA					
			EA					
	<b>Subtotal</b>				151,812		281,937	433,749
<b>26 0000</b>	<b>ELECTRICAL</b>							
<b>26 0500</b>	<b>COMMON WORK RESULTS FOR ELECTRICAL</b>							
	Service:							
	Electrical tap		EA					
	Telephone tap		EA					
	CTV tap		EA					
	Heat trace		LS					
	Feeders		LS					
	Temporary power		LS					
	Data/telephone system:							
	Telephone/data wall outlets		EA					
	Telephone/data floor outlets		EA					
	3/4" conduit with pull line		LF					
	CTV distribution system:							
	Combination data/vtc outlets		EA					
	3/4" conduit with pull line		LF					
	Doorbell entry		EA					
	RFID gates:							
	Reused		EA					
	Additional		EA					
	<b>Subtotal</b>							
<b>26 0519</b>	<b>LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (included w/ other Division 26 sections)</b>							

*Grand Total For HVAC*



NEW YORK CITY DEPARTMENT OF  
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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
26 0526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS (included w/ other Division 26 sections)							
26 0529	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS (included w/ other Division 26 sections)							
26 0533	RACEWAYS AND BOXES (included w/ other Division 26 sections)							
26 0534	BOXES AND FLOOR BOXES (included w/ other Division 26 sections)							
26 0553	ELECTRICAL IDENTIFICATION (included w/ other Division 26 sections)							
26 0800	COMMISSIONING OF ELECTRICAL Commissioning		HRS					
	<b>Subtotal</b>							
26 0923	LIGHTING CONTROL DEVICES Switches: On off Dimmeable Damper Shades Motorized window Day lighting sensor Occupancy sensor switch: Wall mounted Ceiling mounted		EA EA EA EA EA EA EA EA EA EA					
	<b>Subtotal</b>							



NEW YORK CITY DEPARTMENT OF  
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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
26 0936	<b>MODULAR DIMMING CONTROLS</b>							
	Dimmer bank: 3 switch		EA					
	Switchbank:							
	3 switch		EA					
	4 switch		EA					
	Graphic eye system		EA					
	<b>Subtotal</b>							
26 2416	<b>PANELBOARDS</b>							
	(P2A) 100a, 42 circuit		EA					
	(P2) 200a, 42 circuit		EA					
	<b>Subtotal</b>							
26 2726	<b>WIRING DEVICES</b>							
	Receptacles:							
	Duplex		EA					
	Duplex 20 amp		EA					
	Microwave/refrigerator		EA					
	Duplex GFCI		EA					
	Duplex GFI weatherproof		EA					
	Waterproof duplex		EA					
	Quad		EA					
	Wire mold, 20'		EA					
	Junction boxes:							
	Floor		EA					
	Wall, ceiling		EA					
	Backboxes		EA					
	Branch circuit conduit and wire:							
Conduit assorted, including elbows, connectors, couplings and straps		LF						



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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	Wire assorted		LF		↓		↓	↓
	Junction boxes		EA					
	Grounding		LS					
	Core drill		EA					
	Motor connections:							
	Exterior louvers		EA					
	Toilet accessories		EA					
	Window shades, motorized		EA					
	2" rpz		EA					
	Hot water circulator		EA					
	Dampers		EA					
	VAV		EA					
	Exhaust fans		EA					
	RTU-1		EA					
	Electric wall cabinet heaters		EA					
	Relocate existing electric duct heater		EA					
	<b>Subtotal</b>							
26 2727	<b>WIRELESS WIRING DEVICES (included w/ other Division 26 sections)</b>							
26 2813	<b>FUSES (included w/ Section 262819)</b>							
26 2819	<b>DISCONNECT SWITCHES</b>							
	Fused disconnect switch, 200amp		EA		↓		↓	↓
	Combination starter and unfused disconnect switch, 100amp, waterproof		EA					
	<b>Subtotal</b>							
26 2823	<b>CRCUIT BREAKERS (included w/ Section 262416)</b>							





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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	(L17-EM) Recessed 2 x 2 direct/indirect with integral battery pack		EA		↓		↓	↓
	(L17A) Recessed 2 x 2 direct/indirect		EA					
	(L18) Decorative LED pendants		EA					
	(L19) Undercabinet linear fluorescent		EA					
	(L19-EM) Undercabinet linear fluorescent with integral battery pack		EA					
	(LX1) Wall mounted linear fluorescent ceiling washer		EA					
	(LX1A) Wall mounted linear fluorescent wall washer, sign		EA					
	(LX2) Wall mounted led downlight, within skylight		EA					
	(LX4) Recessed compact fluorescent downlight, within canopy		EA					
	(LX4-EM) Recessed compact fluorescent downlight, within canopy with integral battery pack		EA					
	(LX5) Ceramic metal halide floodlight		EA					
	(LX6) Linear		EA					
	Relocated salvaged existing, Linear 4'		EA					
	Relocated salvaged existing, Linear 8'		EA					
	Relocated salvaged existing, 2 x 2		EA					
	Ceiling revision		EA					
	Exit		EA					
	Extra materials:							
	Lamps		EA					
	Ballasts, fluorescent, hid		EA					
	Miscellaneous (including Diffusers and lenses, Globes and guards, Louvers and cones, Custom luminaires)		EA					
	Lighting outlets		EA					
	Fixture tails		EA					
	Lighting fixtures conduit and wire:							



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DESIGN + CONSTRUCTION

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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	Conduit assorted, including elbows, connectors, couplings and straps		LF					
	Wire assorted		LF					
	Junction boxes		EA					
	Grounding		LS					
	<b>Subtotal</b>							
<b>28 0000</b>	<b><u>ELECTRONIC SAFETY AND SECURITY</u></b>							
<b>28 0000</b>	<b>ELECTRONIC SAFETY AND SECURITY</b>							
	Break glass sensor		EA					
	Dome camera indoor fixed wall mounted		EA					
	Dome camera exterior fixed wall mounted		EA					
	Dome camera ceiling mount kit		EA					
	Card reader		EA					
	Motion detector ceiling mounted		EA					
	Magnetic door contact		EA					
	Rack		EA					
	Rack equipment:							
	Video encoder		EA					
	48 port network edge layer 2 gigabit switch w/poe		EA					
	Network video server		EA					
	3000va ups		EA					
	Cabinet		EA					
	Structured wiring box		EA					
	Access control enclosure with 4 controllers		EA					
	Access control power supply		EA					
	Patch panel		EA					
	Burglar alarm control panel		EA					
	Conduit, 3/4" and 1"		LF					

NYC DEPT OF DESIGN+CONSTRUCTION

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Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO		Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
	Wire		LF					
	<b>Subtotal</b>							
283100	Fire Alarm System							
	Relocate remote annunciator panel		EA					
	Floor mounted raceway column for pull boxes		EA					
	<b>Visual fire alarm</b>		EA					
	Visual fire and audible (horn) alarm		EA					
	Manul pull station		EA					
	Smoke detector:							
	Ceiling/wall		EA					
	Duct		EA					
	Ceiling/wall heat detector		EA					
	Ceiling revision		EA					
	Outlets		EA					
	Wire		LF					
	<i>Grand Total For Electrical</i> Subtotal				600,000		1,116,375	1,716,375
310000	Earthwork							
311000	Site Clearing							
	General grading	6,000	SF	0.50	3,000.00	3.00	18,000.00	21,000.00
	<b>Subtotal</b>				<b>3,000.00</b>		<b>18,000.00</b>	<b>21,000.00</b>
310000	Earthwork							
	Excavation	500	CY	10.00	5,000.00	50.00	25,000.00	30,000.00
	General Excavation:							
	Slab cutting area	50	CY	10.00	500.00	50.00	2,500.00	3,000.00
	Slab area	100	CY	10.00	1,000.00	50.00	5,000.00	6,000.00
	Footing/foundation wall	100	CY	10.00	1,000.00	50.00	5,000.00	6,000.00
	3 x 5 trench	100	CY	10.00	1,000.00	65.00	6,500.00	7,500.00



NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO		Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
	Gravel/sand base buy, haul, place, compact	150	CY	65.00	9,750.00	65.00	9,750.00	19,500.00
	Borrow fill buy, load, haul, place, compact:							
	Common	100	CY	25.00	2,500.00	35.00	3,500.00	6,000.00
	Topsoil	50	CY	50.00	2,500.00	50.00	2,500.00	5,000.00
	Disposal	300	CY	10.00	3,000.00	50.00	15,000.00	18,000.00
	Line & grade	3	DAY	100.00	300.00	1,000.00	3,000.00	3,300.00
	<b>Subtotal</b>				<b>26,550.00</b>		<b>77,750.00</b>	<b>104,300.00</b>
316333	Drilled Minipiles							
	Drilled minipiles, 8" d	3,360	LF	50.00	168,000.00	50.00	168,000.00	336,000.00
	Load test	1	LS	2,500.00	2,500.00	5,000.00	5,000.00	7,500.00
	<b>Subtotal</b>				<b>170,500.00</b>		<b>173,000.00</b>	<b>343,500.00</b>
320000	Exterior Improvements							
321000	Paving							
	Asphalt paving: street repair	825	SF	6.00	4,950.00	8.00	6,600.00	11,550.00
	4" reinforced sidewalks	2,558	SF	5.00	12,790.00	9.00	23,022.00	35,812.00
	Sidewalk and curb repair	2	EA	1,000.00	2,000.00	1,300.00	2,600.00	4,600.00
	<b>Subtotal</b>				<b>19,740.00</b>		<b>32,222.00</b>	<b>51,962.00</b>
321413	Precast Concrete Pavers							
	Pavers, including setting bed and 5" concrete base: 12"x24"x2"	1,121	SF	12.00	13,452.00	25.00	28,025.00	41,477.00
	Precast concrete (PP)							
	Pavers, interior: 12"x24"x12" precast concrete (PP2)	189	SF	8.00	1,512.00	12.00	2,268.00	3,780.00
	<b>Subtotal</b>				<b>14,964.00</b>		<b>30,293.00</b>	<b>45,257.00</b>
321540	Crushed Stone Paving							
	(CS1) 1/4", 6" deep over compacted earth	54	SF	5.00	270.00	5.00	270.00	540.00
	(CS2) 1/4" + fines + stabilizer, 6" deep over compacted earth	130	sf	5.00	650.00	5.00	650.00	1,300.00
	<b>Subtotal</b>				<b>920.00</b>		<b>920.00</b>	<b>1,840.00</b>

NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
323117	Ornamental Fencing							
	2 x 2 painted posts with 10" pier and sub base	18	EA	100.00	1,800.00	300.00	5,400.00	7,200.00
	Fencing	874	SF	5.00	4,370.00	7.00	6,118.00	10,488.00
	<b>Subtotal</b>				<b>6,170.00</b>		<b>11,518.00</b>	<b>17,688.00</b>
328400	Irrigation System							
	Passive low flow drip system							
	Control box	1	EA	250.00	250.00	500.00	500.00	750.00
	Tubing	88	LF	50.00	4,400.00	50.00	4,400.00	8,800.00
	<b>Subtotal</b>				<b>4,650.00</b>		<b>4,900.00</b>	<b>9,550.00</b>
329300	Planting							
	Street trees, 2 1/2" - 3" cal	5	EA	100.00	500.00	200.00	1,000.00	1,500.00
	Tree, 8'-10' clump	1	EA	250.00	250.00	500.00	500.00	750.00
	<b>Ferns, 1 gal</b>	327	EA	25.00	8,175.00	50.00	16,350.00	24,525.00
	Vines, 2 gal	14	EA	25.00	350.00	50.00	700.00	1,050.00
	Interior planting:							
	Clumping bamboo, # 5 container	9	EA	25.00	225.00	50.00	450.00	675.00
	Strawberry, 2" pots	274	EA	25.00	6,850.00	50.00	13,700.00	20,550.00
	Tree pits:							
	5'x5' with granite block border	1	EA	250.00	250.00	500.00	500.00	750.00
	6'x10' with granite block border	4	EA	500.00	2,000.00	1,000.00	4,000.00	6,000.00
	Enlarged tree pit with existng tree, 5'x10' with granite block border	5	EA	250.00	1,250.00	500.00	2,500.00	3,750.00
	<b>Subtotal</b>				<b>19,850.00</b>		<b>39,700.00</b>	<b>59,550.00</b>
330000	Utilities							
334000	Storm Drainage Utilities							
	Storm water detention system:							
	Excavation	125	CY	10.00	1,250.00	50.00	6,250.00	7,500.00

NYC DEPT OF DESIGN+CONSTRUCTION

Project: East Elmhurst Branch Library Expansion

Location: 95-08 Astoria Blvd, Queens, NY 11369

CONTRACT 1-GENERAL CONST.

DDC ID: LQQ122EE2

Bidder: National Environmental Safety Company, Inc.

Sponsor Agency: Queens Public Library

CSI NO	Description	Qty	Unit	Material		Labor		Total Material & Labor Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
	Disposal	75	CY	10.00	750.00	50.00	3,750.00	4,500.00
	Drywall, 10' diameter rings, 6' deep	2	EA	15,000.00	30,000.00	10,000.00	20,000.00	50,000.00
	Access cover, solid grate	1	EA	500.00	500.00	500.00	500.00	1,000.00
	Storm drain with sump (DR-1)	1	EA	500.00	500.00	1,500.00	1,500.00	2,000.00
	CI pipe, typical 6"	35	LF	40.00	1,400.00	40.00	1,400.00	2,800.00
	CI pipe, typical 8"	24	LF	50.00	1,200.00	60.00	1,440.00	2,640.00
	Fittings: 6"	1	LS	500.00	500.00	1,500.00	1,500.00	2,000.00
	Fittings: 8"	1	LS	750.00	750.00	2,000.00	2,000.00	2,750.00
	HDEP pipe, perforated 6"	25	LF	25.00	625.00	25.00	625.00	1,250.00
	6" compacted subbase	7	CY	25.00	175.00	50.00	350.00	525.00
	Common fill	25	CY	20.00	500.00	50.00	1,250.00	1,750.00
	3/4" crushed stone	5	CY	100.00	500.00	100.00	500.00	1,000.00
	3" stone	3	CY	100.00	300.00	100.00	300.00	600.00
	Filter fabric	500	SF	4.00	2,000.00	4.00	2,000.00	4,000.00
	Sand column	7	CY	50.00	350.00	65.00	455.00	805.00
	<b>Subtotal</b>				<b>41,300.00</b>		<b>43,820.00</b>	<b>85,120.00</b>
	<b>Total for General Construction</b>				<b>2,793,502.00</b>		<b>5,059,667.00</b>	<b>7,853,553.00</b>

BID BOND 1  
FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS, That we, \_\_\_\_\_  
National Environmental Safety Company, Inc.

\_\_\_\_\_  
12-17 38th Avenue, LIC, NY 11101

hereinafter referred to as the "Principal", and \_\_\_\_\_ Fidelity and Deposit Company of Maryland  
\_\_\_\_\_  
300 Interpace Parkway, Building 1 B/C  
\_\_\_\_\_  
Parsippany, NJ 07054

hereinafter referred to as the "Surety" are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "CITY", or to its successors and assigns in the penal sum of \_\_\_\_\_

\_\_\_\_\_  
Ten Percent of Amount Bid

(\$ 10%), Dollars lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the Principal is about to submit (or has submitted) to the City the accompanying proposal, hereby made a part hereof, to enter into a contract in writing for \_\_\_\_\_

\_\_\_\_\_  
General Construction at East Elmhurst Branch Library (Expansion) in Queens

\_\_\_\_\_  
Contract # LQQ122EE2

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

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

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

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

BID BOND 2

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

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

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

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

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers the 2nd day of October, 2015.

(Seal)

National Environmental Safety Company, Inc. (L.S.)  
Principal

By: [Signature]

(Seal)

Fidelity and Deposit Company of Maryland  
Surety

By: [Signature]  
Susan P. Hammel, Attorney-in-Fact

**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND  
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **MICHAEL BOND, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Susan P. HAMMEL and Wayne D. NOWLAND, both of MELVILLE, New York, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 4th day of September, A.D. 2015.

**ATTEST:**

**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: *Eric D. Barnes*  
*Secretary*  
*Eric D. Barnes*

*Michael Bond*  
*Vice President*  
*Michael Bond*

State of Maryland  
County of Baltimore

On this 4th day of September, A.D. 2015, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **MICHAEL BOND, Vice President, and ERIC D. BARNES, Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposed and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

*Constance A. Dunn*



Constance A. Dunn, Notary Public  
My Commission Expires: July 9, 2019

# FIDELITY AND DEPOSIT COMPANY

OF MARYLAND

600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

## Statement of Financial Condition

As Of December 31, 2014

### ASSETS

Bonds.....	\$ 142,720,308
Stocks .....	21,816,223
Cash and Short Term Investments .....	2,077,768
Reinsurance Recoverable .....	10,375,303
Other Accounts Receivable .....	46,778,921
<b>TOTAL ADMITTED ASSETS .....</b>	<b>\$ 223,768,523</b>

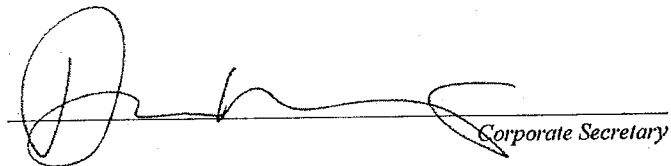
### LIABILITIES, SURPLUS AND OTHER FUNDS

Reserve for Taxes and Expenses .....	\$ 1,321,332
Ceded Reinsurance Premiums Payable.....	49,965,411
Securities Lending Collateral Liability.....	4,009,064
<b>TOTAL LIABILITIES .....</b>	<b>\$ 55,295,807</b>
Capital Stock, Paid Up.....	\$ 5,000,000
Surplus.....	163,472,717
Surplus as regards Policyholders .....	168,472,716
<b>TOTAL.....</b>	<b>\$ 223,768,523</b>

Securities carried at \$58,191,540 in the above statement are deposited with various states as required by law.

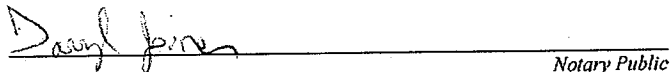
Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of market quotations for all bonds and stocks owned, the Company's total admitted assets at December 31, 2014 would be \$227,936,393 and surplus as regards policyholders \$172,640,586.

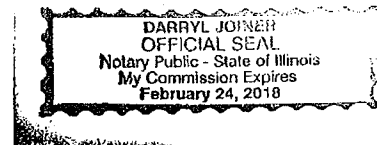
I, DENNIS F. KERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2014.

  
Corporate Secretary

State of Illinois }  
City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois, in the City of Schaumburg, this 15th day of March, 2015.

  
Notary Public



BID BOND 1  
FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS. That we, \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

hereinafter referred to as the "Principal", and \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

hereinafter referred to as the "Surety" are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "CITY", or to its successors and assigns in the penal sum of \_\_\_\_\_  
\_\_\_\_\_

(\$ \_\_\_\_\_), Dollars lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the Principal is about to submit (or has submitted) to the City the accompanying proposal, hereby made a part hereof, to enter into a contract in writing for \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

- (a) Within ten (10) days after notification by the City, execute in quadruplicate and deliver to the City all the executed counterparts of the Contract in the form set forth in the Contract Documents, in accordance with the proposal as accepted, and
- (b) Furnish a performance bond and separate payment bond, as may be required by the City, for the faithful performance and proper fulfillment of such Contract, which bonds shall be satisfactory in all respects to the City and shall be executed by good and sufficient sureties, and
- (c) In all respects perform the agreement created by the acceptance of said Proposal as provided in the Information for Bidders, bound herewith and made a part hereof, or if the City shall reject the aforesaid Proposal, then this obligation shall be null and void; otherwise to remain in full force and effect.



BID BOND 2

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

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

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

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

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

(Seal)

\_\_\_\_\_  
Principal (L.S.)

By: \_\_\_\_\_

(Seal)

\_\_\_\_\_  
Surety

By: \_\_\_\_\_

ACKNOWLEDGEMENT OF PRINCIPAL, IF A CORPORATION

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:  
On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, before me personally came  
\_\_\_\_\_ to me known, who, being by me duly sworn, did depose and say that he  
resides at \_\_\_\_\_  
that he is the \_\_\_\_\_ 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.

\_\_\_\_\_  
Notary Public

ACKNOWLEDGEMENT 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

ACKNOWLEDGEMENT 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

AFFIX ACKNOWLEDGEMENTS AND JUSTIFICATION OF SURETIES

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## BID BREAKDOWN

**Submission:** Bidders are advised that the requirement to submit a Bid Breakdown applies to each contract for which an "X" is indicated before the word "Yes". If required, the bidder must submit, with its bid, a completed Bid Breakdown. Failure to provide a completed Bid Breakdown may result in rejection of the bid as non-responsive.

      X            YES                                              NO

### Limitations on Use of Bid Breakdown:

Bidders are advised that the Bid Breakdown shall be used for bid analysis purposes only and shall not be binding for any other purposes under the Contract, including, without limitation, for payment purposes or in connection with a contractor claim for extra work. If the form for the Bid Breakdown does not include an item of work required by the Contract Documents, such omission shall have no effect whatsoever, nor shall it be used by the contractor in connection with a claim for extra work (i.e., work for which the contractor is entitled to a change order).

### Instructions for Preparing Bid Breakdown:

- (A) The Bid Breakdown is set forth on the following pages of this Bid Booklet and is in accordance with the Construction Specification Institute (CSI) format. For all items of work listed in the Bid Breakdown, the bidder must indicate the price for labor and the price for material, as well as the estimated quantities required.
- (B) In preparing its Bid Breakdown, the bidder shall submit prices that include all costs for overhead and profit. Overhead shall include, without limitation, all costs in connection with the following: administration, management, superintendence, small tools, insurance, bonds, and provision of services or items required by the General Conditions [except for Security/Fire Guard Services and Temporary Heat]. If the Project requires Security/Fire Guard Services and/or Temporary Heat, such service(s) will be included as separate line items in the Bid Breakdown.
- (C) If an item is set forth in the Bid Breakdown, but is not included in the Contract Documents (Drawings, Specifications, General Conditions, and/or Addenda), the bidder is advised to leave the item blank and exclude the cost of the item from its grand total. In an attachment to its Bid Breakdown, the bidder shall provide a list of all items left blank.
- (D) If an item is not set forth in the Bid Breakdown, but is included in the Contract Documents (Drawings, Specifications, General Conditions, and/or Addenda), the bidder is advised to add the item to its Bid Breakdown and include the cost of the item in its grand total. In an attachment to its Bid Breakdown, the bidder shall provide a list of all items added.

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**ATTACHMENT 1 - BID INFORMATION  
PROJECT ID: LQQ122EE2**

**DESCRIPTION AND LOCATION OF WORK:**

**East Elmhurst Branch Library Expansion  
95-08 Astoria Boulevard  
Queens, New York 11369  
E-PIN: 85014B0176 / DDC PIN: 8502014LQ0006C**

**DOCUMENTS AVAILABLE AT:**

Department of Design and Construction, Contract Section  
30-30 Thomson Avenue - First Floor, Long Island City, NY 11101

**SUBMISSION OF BIDS BEFORE BID OPENING:**

**TIME TO SUBMIT:**

On or Before: **FRIDAY, OCTOBER 02, 2015**  
**BIDS MUST BE CLOCKED IN PRIOR TO BID OPENING**

**PLACE TO SUBMIT:**

Department of Design and Construction, Contract Section (located behind Security Desk)  
30-30 Thomson Avenue - First Floor, Long Island City, NY 11101

**BID OPENING:**

<b>PLACE OF BID OPENING:</b>	Department of Design and Construction Contract Section 30-30 Thomson Avenue – First Floor Long Island City, NY 11101
<b>DATE AND HOUR:</b>	<b>FRIDAY, OCTOBER 02, 2015 AT 2:00 PM</b>
	<b>LATE BIDS WILL NOT BE ACCEPTED</b>

**PRE-BID WALK-THRU AND CONFERENCE:**

<b>PLACE</b>	East Elmhurst Branch Library 95-08 Astoria Boulevard Queens, New York 11369
<b>DATE AND HOUR</b>	<b>FRIDAY, SEPTEMBER 18, 2015 AT 10:00 AM</b>
<b>MANDATORY OR OPTIONAL</b>	<b>OPTIONAL</b>

**BID SECURITY:**

Bid Security is required in the amount set forth below; provided, however, bid security is not required if the TOTAL BID PRICE set forth on the Bid Form is less than \$1,000,000.

- (1) Bond in an amount not less than 10% of the TOTAL BID PRICE set forth on the Bid Form, OR
- (2) Certified Check in an amount not less than 2% of the TOTAL BID PRICE set forth on the Bid Form

**PERFORMANCE AND PAYMENT SECURITY:**

Required for Contracts in the amount of \$1,000,000.00 or more. Performance and Payment Security shall each be in an amount equal to 100% of the Contract Price

**AGENCY CONTACT PERSON:**

Lorraine Holley, 30-30 Thomson Avenue - First Floor, Long Island City, Queens, NY 11101  
Telephone (718) 391-3170 or (718) 391-1016 Fax: (718) 391-2615

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**BID BOOKLET  
PART B**



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## SAFETY QUESTIONNAIRE

The bidder must include, with its bid, all information requested on this Safety Questionnaire. Failure to provide a completed and signed Safety Questionnaire at the time of bid opening may result in disqualification of the bid as non-responsive.

**1. Bidder Information:**

Company Name: National Environmental Safety Co. Inc.

DDC Project Number: 100122EEJ

Company Size: \_\_\_\_\_ Ten (10) employees or less

X Greater than ten (10) employees

Company has previously worked for DDC X YES \_\_\_\_\_ NO

**2. Type(s) of Construction Work**

TYPE OF WORK	LAST 3 YEARS	THIS PROJECT
General Building Construction	<u>✓</u>	<u>✓</u>
Residential Building Construction	<u>✓</u>	_____
Nonresidential Building Construction	<u>✓</u>	_____
Heavy Construction, except building	<u>✓</u>	_____
Highway and Street Construction	_____	_____
Heavy Construction, except highways	<u>✓</u>	_____
Plumbing, Heating, HVAC	<u>✓</u>	_____
Painting and Paper Hanging	<u>✓</u>	_____
Electrical Work	<u>✓</u>	_____
Masonry, Stonework and Plastering	<u>✓</u>	_____
Carpentry and Floor Work	<u>✓</u>	_____
Roofing, Siding, and Sheet Metal	<u>✓</u>	_____
Concrete Work	<u>✓</u>	_____
Specialty Trade Contracting	<u>✓</u>	_____
Asbestos Abatement	<u>✓</u>	_____
Other (specify)	_____	_____

**3. Experience Modification Rate:**

The Experience Modification Rate (EMR) is a rating generated by the National Council of Compensation Insurance (NCCI). This rating is used to determine the contractor's premium for worker's compensation insurance. The contractor may obtain its EMR by contacting its insurance broker or the NCCI. If the contractor cannot obtain its EMR, it must submit a written explanation as to why.

Summary of Work-Related Injuries and Illnesses

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.  
 Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0".  
 Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Deaths			
Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0 (G)	 (H)	 (I)	 (J)
Number of Days			
Total number of days away from work	Total number of days of job transfer or restriction		
0 (K)	 (L)		
Injury and Illness Types			
Total number of (M)			
(1) Injuries	0	(4) Poisonings	0
(2) Skin disorders	0	(5) Hearing loss	0
(3) Respiratory conditions	0	(6) All other illnesses	0

**Establishment Information**

Your establishment name: National Environmental Safety Co. Inc.  
 Street: 12-17 38th Avenue  
 City: Long Island City, New York 11101

Industry description (e.g., *Manufacture of motor truck trailers*): \_\_\_\_\_  
 Standard Industrial Classification (SIC), if known (e.g., 3715): \_\_\_\_\_  
 OR  
 North American Industrial Classification (NAICS), if known (e.g., 336212): \_\_\_\_\_

**Employment Information** (If you don't have these figures, see the Worksheet on the back of this page to estimate.)

Annual average number of employees: \_\_\_\_\_  
 Total hours worked by all employees last year: \_\_\_\_\_

Sign here: [Signature]  
 Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Company name: NEC  
 Title: CEO  
 Date: 1/15

Post this Summary page from February 1 to April 30 of the year following the year covered by the forms.  
 Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspect of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3641, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

**Optional**

**Worksheet to Help You Fill Out the Summary**

At the end of the year, OSHA requires you to enter the average number of employees and the total hours worked by your employees on the summary. If you don't have these figures, you can use the information on this page to estimate the numbers you will need to enter on the Summary page at the end of the year.

**How to figure the average number of employees who worked for your establishment during the year:**

- 1 Add the total number of employees your establishment paid in all pay periods during the year. Include all employees, full-time, part-time, temporary, seasonal, salaried, and hourly.  
 The number of employees paid in all pay periods = 0
- 2 Count the number of pay periods your establishment had during the year. Be sure to include any pay periods when you had no employees.  
 The number of pay periods during the year = 0
- 3 Divide the number of employees by the number of pay periods.  
 $\frac{0}{0} = 0$
- 4 Round the answer to the next highest whole number. Write the rounded number in the blank marked Annual average number of employees.  
 The number rounded = 0

For example, Acme Construction figured its average employment this way.

For pay period...	Acme paid this number of employees...	
1	10	
2	0	Number of employees paid = 830
3	15	
4	30	Number of pay periods = 26
5	40	830 = 31.92
6	50	26
7	20	31.92 rounds to 32
8	15	32 is the annual average number of employees
9	+10	
10	830	

**How to figure the total hours worked by all employees:**

Include hours worked by salaried, hourly, part-time and seasonal workers, as well as hours worked by other workers subject to day to day supervision by your establishment (e.g., temporary help services workers).  
 Do not include vacation, sick leave, holidays, or any other non-work time, even if employees were paid for it. If your establishment keeps records of only the hours paid or if you have employees who are not paid by the hour, please estimate the hours that the employees actually worked.  
 If this number isn't available, you can use this optional worksheet to estimate it.

**Optional Worksheet**

- 1 Find the number of full-time employees in your establishment for the year.
- 2 Multiply by the number of work hours for a full-time employee in a year.
- 3 This is the number of full-time hours worked.
- 4 Add the number of any overtime hours as well as the hours worked by other employees (part-time, temporary, seasonal)
- 5 Round the answer to the next highest whole number. Write the rounded number in the blank marked Total hours worked by all employees last year.

# Summary of Work-Related Injuries and Illnesses

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this Summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases			
Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
<u>0</u> (G)	<u>0</u> (H)	<u>0</u> (I)	<u>0</u> (J)

Number of Days	
Total number of days away from work	Total number of days of job transfer or restriction
<u>0</u> (K)	<u>0</u> (L)

Injury and Illness Types			
Total number of (M)			
(1) Injuries	<u>0</u>	(4) Poisonings	<u>0</u>
(2) Skin disorders	<u>0</u>	(5) Hearing loss	<u>0</u>
(3) Respiratory conditions	<u>0</u>	(6) All other illnesses	<u>0</u>

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to this collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspect of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment Information	
Your establishment name	_____
Street	<b>National Environmental Safety Co. Inc.</b>
City	<b>12-17 38th Avenue</b> State <u>NY</u> ZIP _____
	<b>Long Island City, New York 11101</b>
Industry description (e.g., <i>Manufacture of motor truck trailers</i> )	_____
Standard Industrial Classification (SIC), if known (e.g., 3713)	_____
OR	_____
North American Industrial Classification (NAICS), if known (e.g., 336212)	_____
<b>Employment Information</b> (If you don't have these figures, see the Worksheet on the back of this page to estimate.)	
Annual average number of employees	_____
Total hours worked by all employees last year	_____
Sign here	<u>[Signature]</u>
Knowingly falsifying this document may result in a fine.	
I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.	
Company name	<u>CFC</u>
Phone	<u>718 361-0044</u>
Date	<u>1-14</u>

## Optional

### Worksheet to Help You Fill Out the Summary

At the end of the year, OSHA requires you to enter the average number of employees and the total hours worked by your employees on the summary. If you don't have these figures, you can use the information on this page to estimate the numbers you will need to enter on the Summary page at the end of the year.

**How to figure the average number of employees who worked for your establishment during the year:**

- Add the total number of employees your establishment paid in all pay periods during the year. Include all employees: full-time, part-time, temporary, seasonal, salaried, and hourly.  
 The number of employees paid in all pay periods = 0
- Count the number of pay periods your establishment had during the year. Be sure to include any pay periods when you had no employees.  
 The number of pay periods during the year = 0
- Divide the number of employees by the number of pay periods.  
 $\frac{0}{0} = 0$
- Round the answer to the next highest whole number. Write the rounded number in the blank marked **Annual average number of employees**.  
 The number rounded = 0

**How to figure the total hours worked by all employees:**

Include hours worked by salaried, hourly, part-time and seasonal workers, as well as hours worked by other workers subject to day to day supervision by your establishment (e.g., temporary help services workers).  
 Do not include vacation, sick leave, holidays, or any other non-work time, even if employees were paid for it. If your establishment keeps records of only the hours paid or if you have employees who are not paid by the hour, please estimate the hours that the employees actually worked.  
 If this number isn't available, you can use this optional worksheet to estimate it.

#### Optional Worksheet

- Find the number of full-time employees in your establishment for the year.  
X
- Multiply by the number of work hours for a full-time employee in a year.  
 \_\_\_\_\_
- This is the number of full-time hours worked.  
 \_\_\_\_\_
- Add the number of any overtime hours as well as the hours worked by other employees (part-time, temporary, seasonal)  
 \_\_\_\_\_
- Round the answer to the next highest whole number. Write the rounded number in the blank marked **Total hours worked by all employees last year**.  
 \_\_\_\_\_

For example, Acme Construction figured its average employment this way:

For pay period...	Acme paid this number of employees...		
1	10	Number of employees paid = 830	0
2	0		
3	15	Number of pay periods = 26	0
4	30		
5	40	830 ÷ 26 = 31.92	0
6	20	26	0
7	15	31.92 rounds to 32	0
8	26	32 is the annual average number of employees	0
9	830		

# Summary of Work-Related Injuries and Illnesses

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.  
 Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."  
 Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases			
Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
(G)	(H)	(I)	(J)

Number of Days	
Total number of days away from work	Total number of days of job transfer or restriction
<u>0</u>	<u>0</u>
(K)	(L)

Injury and Illness Types			
Total number of:			
(M)			
(1) Injuries	<u>0</u>	(4) Poisonings	<u>0</u>
(2) Skin disorders	<u>0</u>	(5) Hearing loss	<u>0</u>
(3) Respiratory conditions	<u>0</u>	(6) All other illnesses	<u>0</u>

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspect of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-5644, 200 Constitution Avenue, NW, Washington, DC 20218. Do not send the completed forms to this office.

Establishment information	
Your establishment name	National Environmental Safety Co. Inc.
Street	12-17 38th Avenue
City	Long Island City, New York 11101
Industry description (e.g., Manufacture of motor truck trailers)	
Standard Industrial Classification (SIC), if known (e.g., 3715)	
OR	
North American Industrial Classification (NAICS), if known (e.g., 336212)	
Employment information (If you don't have these figures, see the Worksheet on the back of this page to estimate.)	
Annual average number of employees	
Total hours worked by all employees last year	
Sign here	<u>[Signature]</u>
Knowingly falsifying this document may result in a fine.	
I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.	
Company received	<u>CFC</u>
Date	<u>12-1-13</u>

## Optional

### Worksheet to Help You Fill Out the Summary

At the end of the year, OSHA requires you to enter the average number of employees and the total hours worked by your employees on the summary. If you don't have these figures, you can use the information on this page to estimate the numbers you will need to enter on the Summary page at the end of the year.

**How to figure the average number of employees who worked for your establishment during the year:**

- Add the total number of employees your establishment paid in all pay periods during the year. Include all employees: full-time, part-time, temporary, seasonal, salaried, and hourly.  
 The number of employees paid in all pay periods = 3
- Count the number of pay periods your establishment had during the year. Be sure to include any pay periods when you had no employees.  
 The number of pay periods during the year = 26
- Divide the number of employees by the number of pay periods.  
 $\frac{3}{26} = .115$
- Round the answer to the next highest whole number. Write the rounded number in the blank marked Annual average number of employees.  
 The number rounded = 1

For example, Acme Construction figured its average employment this way:

For pay period...	Acme paid this number of employees...	
1	10	Number of employees paid = 830
2	0	
3	15	Number of pay periods = 26
4	30	
5	40	830 = 31.92
6	20	
7	15	31.92 rounds to 32
8	10	
9	5	32 is the annual average number of employees
10	0	

**How to figure the total hours worked by all employees:**

Include hours worked by salaried, hourly, part-time and seasonal workers, as well as hours worked by other workers subject to day to day supervision by your establishment (e.g., temporary help services workers).  
 Do not include vacation, sick leave, holidays, or any other non-work time, even if employees were paid for it. If your establishment keeps records of only the hours paid or if you have employees who are not paid by the hour, please estimate the hours that the employees actually worked.  
 If this number isn't available, you can use this optional worksheet to estimate it.

#### Optional Worksheet

- Find the number of full-time employees in your establishment for the year.
- Multiply by the number of work hours for a full-time employee in a year.
- This is the number of full-time hours worked.
- Add the number of any overtime hours as well as the hours worked by other employees (part-time, temporary, seasonal)
- Round the answer to the next highest whole number. Write the rounded number in the blank marked Total hours worked by all employees last year.

The Contractor must indicate its Intrastate and Interstate EMR for the past three years. [Note: For contractors with less than three years of experience, the EMR will be considered to be 1.00].

YEAR	INTRASTATE RATE	INTERSTATE RATE
<u>2013-2014</u>	<u>1.22</u>	<u>0</u>
<u>2012-2013</u>	<u>.96</u>	<u>0</u>
<u>2011-2012</u>	<u>.73</u>	<u>0</u>

If the Intrastate and/or Interstate EMR for any of the past three years is greater than 1.00, the contractor must attach, to this questionnaire, a written explanation for the rating and identify what corrective action was taken to correct the situation resulting in that rating.

**4. OSHA Information:**

YES  NO Contractor has received a willful violation issued by OSHA or New York City Department of Buildings (NYCDOB) within the last three years.

YES  NO Contractor has had an incident requiring OSHA notification within 8 hours (i.e., fatality, or hospitalization of three or more employees).

The Occupational Safety and Health Act (OSHA) of 1970 requires employers with ten or more employees, on a yearly basis to complete and maintain on file the form entitled "Log of Work-related Injuries and Illnesses". This form is commonly referred to as the OSHA 300 Log (OSHA 200 Log for 2001 and earlier).

The OSHA 300 Log must be submitted for the last three years for contractors with more than ten employees.

The Contractor must indicate the total number of hours worked by its employees, as reflected in payroll records for the past three years.

The contractor must submit the Incident Rate for Lost Time Injuries (the Incident Rate) for the past three years. The Incident Rate is calculated in accordance with the formula set forth below. For each given year, the total number of incidents is the total number of non-fatal injuries and illnesses reported on the OSHA 300 Log. The 200,000 hours represents the equivalent of 100 employees working forty hours a week, fifty weeks per year.

$$\text{Incident Rate} = \frac{\text{Total Number of Incidents} \times 200,000}{\text{Total Number of Hours Worked by Employees}}$$

YEAR	TOTAL NUMBERS OF HOURS WORKED BY EMPLOYEES	INCIDENT RATE
<u>2013</u>	<u>198,000</u>	<u>0</u>
<u>2012</u>	<u>212,316</u>	<u>0</u>
<u>2011</u>	<u>190,228</u>	<u>0</u>

If the contractor's Incident Rate for any of the past three years is one point higher than the Incident Rate for the type of construction it performs (listed below), the contractor must attach, to this questionnaire, a written explanation for the relatively high rate.

General Building Construction	8.5
Residential Building Construction	7.0
Nonresidential Building Construction	10.2
Heavy Construction, except building	8.7
Highway and Street Construction	9.7
Heavy Construction, except highways	8.3
Plumbing, Heating, HVAC	11.3
Painting and Paper Hanging	6.9
Electrical Work	9.5
Masonry, Stonework and Plastering	10.5
Carpentry and Floor Work	12.2
Roofing, Siding, and Sheet Metal	10.3
Concrete Work	8.6
Specialty Trade Contracting	8.6

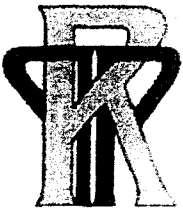
**5. Safety Performance on Previous DDC Project(s)**

YES  NO Contractor previously audited by the DDC Office of Site Safety.  
 DDC Project Number(s): \_\_\_\_\_

YES  NO Accident on previous DDC Project(s).  
 DDC Project Number(s): \_\_\_\_\_

YES  NO Fatality or Life-altering Injury on DDC Project(s) within the last three years.  
 [Examples of a life-altering injury include loss of limb, loss of a sense (e.g., sight, hearing), or loss of neurological function].  
 DDC Project Number(s): \_\_\_\_\_

Date: 10/16/2015 By: [Signature]  
 (Signature of Owner, Partner, Corporate Officer)  
 Title: Vice President



# PROFESSIONAL RISK PLANNERS

June 12, 2014

Mr. Christopher Holtz  
National Environmental Safety Company, Inc.  
12-17 38<sup>th</sup> Avenue  
Long Island City, NY 11101

**RE: Experience Modification Rating  
Workers Compensation**

Dear Mr. Holtz:

Please be advised that the New York Compensation Insurance Rating Board has issued the following Workers Compensation rating for you.

<u>Year</u>	<u>Policy #</u>	<u>EMR</u>
13-14	0044727381	1.22
12-13	0044727381	.96
11-12	WC005319780	.73

Should you have any questions or require any additional information please feel free to contact me. As always thank you for the opportunity to service your valuable account.

Sincerely,

Dona Laura LiCausi  
Senior Account Executive

INSURANCE SPECIALISTS SINCE 1993

PHONE (631) 360-8800

1373-20 VETERANS MEMORIAL HWY., HAUPPAUGE, NY 11788

FAX (631) 360-8875



## SAFETY QUESTIONNAIRE

The bidder must include, with its bid, all information requested on this Safety Questionnaire. Failure to provide a completed and signed Safety Questionnaire at the time of bid opening may result in disqualification of the bid as non-responsive.

**1. Bidder Information:**

Company Name: \_\_\_\_\_

DDC Project Number: \_\_\_\_\_

Company Size:           \_\_\_\_\_ Ten (10) employees or less  
                                   \_\_\_\_\_ Greater than ten (10) employees

Company has previously worked for DDC       \_\_\_\_\_ YES                               \_\_\_\_\_ NO

**2. Type(s) of Construction Work**

TYPE OF WORK	LAST 3 YEARS	THIS PROJECT
General Building Construction	_____	_____
Residential Building Construction	_____	_____
Nonresidential Building Construction	_____	_____
Heavy Construction, except building	_____	_____
Highway and Street Construction	_____	_____
Heavy Construction, except highways	_____	_____
Plumbing, Heating, HVAC	_____	_____
Painting and Paper Hanging	_____	_____
Electrical Work	_____	_____
Masonry, Stonework and Plastering	_____	_____
Carpentry and Floor Work	_____	_____
Roofing, Siding, and Sheet Metal	_____	_____
Concrete Work	_____	_____
Specialty Trade Contracting	_____	_____
Asbestos Abatement	_____	_____
<b>Other (specify)</b>	_____	_____
_____	_____	_____

**3. Experience Modification Rate:**

The Experience Modification Rate (EMR) is a rating generated by the National Council of Compensation Insurance (NCCI). This rating is used to determine the contractor's premium for worker's compensation insurance. The contractor may obtain its EMR by contacting its insurance broker or the NCCI. If the contractor cannot obtain its EMR, it must submit a written explanation as to why.

The Contractor must indicate its Intrastate and Interstate EMR for the past three years. [Note: For contractors with less than three years of experience, the EMR will be considered to be 1.00].

YEAR	INTRASTATE RATE	INTERSTATE RATE
_____	_____	_____
_____	_____	_____
_____	_____	_____

**If the Intrastate and/or Interstate EMR for any of the past three years is greater than 1.00, the contractor must attach, to this questionnaire, a written explanation for the rating and identify what corrective action was taken to correct the situation resulting in that rating.**

**4. OSHA Information:**

\_\_\_\_\_ YES      \_\_\_\_\_ NO      Contractor has received a willful violation issued by OSHA or New York City Department of Buildings (NYCDOB) within the last three years.

\_\_\_\_\_ YES      \_\_\_\_\_ NO      Contractor has had an incident requiring OSHA notification within 8 hours (i.e., fatality, or hospitalization of three or more employees).

The Occupational Safety and Health Act (OSHA) of 1970 requires employers with ten or more employees, on a yearly basis to complete and maintain on file the form entitled "Log of Work-related Injuries and Illnesses". This form is commonly referred to as the OSHA 300 Log (OSHA 200 Log for 2001 and earlier).

The OSHA 300 Log must be submitted for the last three years for contractors with more than ten employees.

The Contractor must indicate the total number of hours worked by its employees, as reflected in payroll records for the past three years.

**The contractor must submit the Incident Rate for Lost Time Injuries (the Incident Rate) for the past three years. The Incident Rate is calculated in accordance with the formula set forth below. For each given year, the total number of incidents is the total number of non-fatal injuries and illnesses reported on the OSHA 300 Log. The 200,000 hours represents the equivalent of 100 employees working forty hours a week, fifty weeks per year.**

Incident Rate = 
$$\frac{\text{Total Number of Incidents} \times 200,000}{\text{Total Number of Hours Worked by Employees}}$$

YEAR	TOTAL NUMBERS OF HOURS WORKED BY EMPLOYEES	INCIDENT RATE
_____	_____	_____
_____	_____	_____
_____	_____	_____

**If the contractor's Incident Rate for any of the past three years is one point higher than the Incident Rate for the type of construction it performs (listed below), the contractor must attach, to this questionnaire, a written explanation for the relatively high rate.**

General Building Construction	8.5
Residential Building Construction	7.0
Nonresidential Building Construction	10.2
Heavy Construction, except building	8.7
Highway and Street Construction	9.7
Heavy Construction, except highways	8.3
Plumbing, Heating, HVAC	11.3
Painting and Paper Hanging	6.9
Electrical Work	9.5
Masonry, Stonework and Plastering	10.5
Carpentry and Floor Work	12.2
Roofing, Siding, and Sheet Metal	10.3
Concrete Work	8.6
Specialty Trade Contracting	8.6

**5. Safety Performance on Previous DDC Project(s)**

YES  NO Contractor previously audited by the DDC Office of Site Safety.  
 DDC Project Number(s): \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

YES  NO Accident on previous DDC Project(s).  
 DDC Project Number(s): \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

YES  NO Fatality or Life-altering Injury on DDC Project(s) within the last three years.  
 [Examples of a life-altering injury include loss of limb, loss of a sense (e.g., sight, hearing), or loss of neurological function].  
 DDC Project Number(s): \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Date: \_\_\_\_\_ By: \_\_\_\_\_  
 (Signature of Owner, Partner, Corporate Officer)

Title: \_\_\_\_\_

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## 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 facsimile or in writing and will specify the types of information which must be submitted.

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

\*\*\*\*\*

(A) **Project Reference Form:** If required, the bidder must complete and submit the Project Reference Form set forth on pages 28 through 30 of this Bid Booklet. The Project Reference Form consists of 3 parts: (1) Similar 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 shall submit such additional information as the Commissioner may require, including without limitation, 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.

**A. PROJECT REFERENCES – SIMILAR CONTRACTS COMPLETED BY THE BIDDER**

List all contracts substantially completed within the last 4 years similar to the contract being awarded, 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. PROJECT REFERENCES – 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. PROJECT REFERENCES – 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

**THIS PAGE INTENTIONALLY LEFT BLANK**

**OFFICE OF THE MAYOR  
BUREAU OF LABOR SERVICES  
CONTRACT CERTIFICATE**

To be completed if the contract is less than \$1,000,000

Contractor: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Telephone Number: \_\_\_\_\_

Name and Title of Signatory: \_\_\_\_\_  
\_\_\_\_\_

Contracting Agency or Owner: \_\_\_\_\_

Project Number: \_\_\_\_\_

Proposed Contract Amount: \_\_\_\_\_

Description and Address of Proposed Contract: \_\_\_\_\_

Names of Subcontractors in the amount of 750,000 or more on this contract (if not known at this time, so state indicating that trades will be subcontracted):  
\_\_\_\_\_  
\_\_\_\_\_

I, (fill in name of person signing) \_\_\_\_\_,  
hereby affirm that I am authorized by the above-named contractor to certify that said contractor's proposed contract with the above-named owner or city agency is less than \$1,000,000. This affirmation is made in accordance with Executive Order No. 50 (1980) as amended and its implementing regulations.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

**WILLFUL OR FRAUDULENT FALSIFICATION OF ANY DATA OR INFORMATION SUBMITTED HERewith MAY RESULT IN THE TERMINATION OF ANY CONTRACT BETWEEN THE CITY AND THE BIDDER OR CONTRACTOR AND BAR THE BIDDER OR CONTRACTOR FROM PARTICIPATION IN ANY CITY CONTRACT FOR A PERIOD OF UP TO THREE YEARS. FURTHER, SUCH FALSIFICATION MAY RESULT IN CRIMINAL PROSECUTION.**

**THIS PAGE INTENTIONALLY LEFT BLANK**

**VENDEX COMPLIANCE**

(A) **Vendex Fees:** Pursuant to Procurement Policy Board Rule 2-08(f)(2), the contractor will be charged a fee for the administration of the VENDEX system, including the Vendor Name Check process, if a Vendor Name Check review is required to be conducted by the Department of Investigation. The contractor shall also be required to pay the applicable required fees for any of its subcontractors for which Vendor Name Check reviews are required. The fee(s) will be deducted from payments made to the contractor under the contract. For contracts with an estimated value of less than or equal to \$1,000,000, the fee will be \$175 per Vendor Name Check review. For contracts with an estimated value of greater than \$1,000,000, the fee will be \$350 per Vendor Name Check review.

(B) **Confirmation of Vendex Compliance:** The Bidder shall submit this Confirmation of Vendex Compliance to the Department of Design and Construction, Contracts Section, 30-30 Thomson Avenue – First Floor, Long Island City, NY 11101.

**Bid Information:** The Bidder shall complete the bid information set forth below.

Name of Bidder: National Environmental Supply Co. Inc.  
Bidder's Address: 12-17 38<sup>th</sup> Ave, LIC, NY 11101  
Bidder's Telephone Number: (718) 361 2044  
Bidder's Fax Number: (718) 361-0846  
Date of Bid Opening: October 16, 2015  
Project ID: LQQ122EE2

**Vendex Compliance:** To demonstrate compliance with Vendex requirements, the Bidder shall complete either Section (1) or Section (2) below, whichever applies.

(1) **Submission of Vendex Questionnaires to MOCS:** By signing in the space provided below, the Bidder certifies that as of the date specified below, the Bidder has submitted Vendex Questionnaires to the Mayor's Office of Contract Services, Attn: VENDEX, 253 Broadway, 9<sup>th</sup> Floor, New York, New York 10007.

Date of Submission: \_\_\_\_\_

By: \_\_\_\_\_  
(Signature of Partner or corporate officer)

Print Name: \_\_\_\_\_

(2) **Submission of Certification of No Change to DDC:** By signing in the space provided below, the Bidder certifies that it has read the instructions in a "Vendor's Guide to Vendex" and that such instructions do not require the Bidder to submit Vendex Questionnaires. The Bidder has completed **TWO ORIGINALS** of the Certification of No Change set forth on the next page of this Bid Booklet.

By: Mark Canellos V.P.  
(Signature of Partner or corporate officer)

Print Name: Mark Canellos, V.P.

**VENDEX COMPLIANCE**

(A) **Vendex Fees:** Pursuant to Procurement Policy Board Rule 2-08(f)(2), the contractor will be charged a fee for the administration of the VENDEX system, including the Vendor Name Check process, if a Vendor Name Check review is required to be conducted by the Department of Investigation. The contractor shall also be required to pay the applicable required fees for any of its subcontractors for which Vendor Name Check reviews are required. The fee(s) will be deducted from payments made to the contractor under the contract. For contracts with an estimated value of less than or equal to \$1,000,000, the fee will be \$175 per Vendor Name Check review. For contracts with an estimated value of greater than \$1,000,000, the fee will be \$350 per Vendor Name Check review.

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Bidder's Address: \_\_\_\_\_  
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Bidder's Fax Number: \_\_\_\_\_  
Date of Bid Opening: \_\_\_\_\_  
Project ID: \_\_\_\_\_

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By: \_\_\_\_\_  
(Signature of Partner or corporate officer)

Print Name: \_\_\_\_\_

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By: \_\_\_\_\_  
(Signature of Partner or corporate officer)

Print Name: \_\_\_\_\_

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# Certificate of No Change Form



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- Please submit two completed forms. Copies will not be accepted.
- Please send both copies to the agency that requested it, unless you are advised to send it directly to the Mayor's Office of Contract Services (MOCS).
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- A materially false statement willfully or fraudulently made in connection with this certification may subject the person making the false statement to criminal charges

I, Mark Canellos, V.P., being duly sworn, state that I have read  
*Enter Your Name*

and understand all the items contained in the vendor questionnaire and any submission of change as identified on page one of this form and certify that as of this date, these items have not changed. I further certify that, to the best of my knowledge, information and belief, those answers are full, complete, and accurate; and that, to the best of my knowledge, information, and belief, those answers continue to be full, complete, and accurate.

In addition, I further certify on behalf of the submitting vendor that the information contained in the principal questionnaire(s) and any submission of change identified on page two of this form have not changed and have been verified and continue, to the best of my knowledge, to be full, complete and accurate.

I understand that the City of New York will rely on the information supplied in this certification as additional inducement to enter into a contract with the submitting entity.

## Vendor Questionnaire *This section is required.*

*This refers to the vendor questionnaire(s) submitted for the vendor doing business with the City.*

Name of Submitting Entity: National Environmental Safety Co., Inc.

Vendor's Address: 12-17 38<sup>th</sup> Avenue, L.I.C., NY 11101

Vendor's EIN or TIN: 11-293 9703 Requesting Agency: NYC.DDC

Are you submitting this Certification as a parent? (Please circle one)  Yes  No

Signature date on the last full vendor questionnaire signed by the submitting vendor: 3/07/2012

Signature date on changed submission, if applicable, for the submitting vendor: 3/07/2012



Principal Questionnaire

This section refers to the most recent principal questionnaire submissions.



Principal Name	Date of signature on last full Principal Questionnaire	Date(s) of signature on Changed Submission (if applicable)
1 Dominick Fertitta	3/07/2012	3/07/2012
2 Mark Canellos	3/07/2012	3/07/2012
3		
4		
5		
6		

Check if additional changes were submitted and attach a document with the date of additional submissions.

Certification *This section is required.*

This form must be signed and notarized. Please complete this twice. Copies will not be accepted.

Certified By:

Mark Canellos

Name (Print)

Vice President

Title

National Environmental Safety Co., Inc.

Name of Submitting Entity

Mulcahy

Signature

10/16/2015  
Date

Notarized By:

Jamie Rivera  
Notary Public

JAMIE RIVERA  
Notary Public - State of New York  
No. 01RI6245854  
Bronx County  
Comm. Exp. August 8, 2019

County License Issued

License Number

Sworn to before me on: 10/16/2015  
Date

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Vendor's EIN or TIN: 11-293 9703 Requesting Agency: NYC DDC

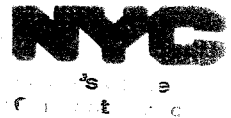
Are you submitting this Certification as a parent? (Please circle one)  Yes  No

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Principal Name	Date of signature on last full Principal Questionnaire	Date(s) of signature on Changed Submission (if applicable)
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3		
4		
5		
6		

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Certified By:

Mark Canellos

Name (Print)

Vice President

Title

National Environmental Safety Co., Inc.

Name of Submitting Entity

Muller

Signature

10/16/2015

Date

JAMIE RIVERA  
Notary Public - State of New York  
No. 01R16245854  
Bronx County  
Comm. Exp. August 8, 2019

Notarized By:

Jamie Rivera

Notary Public

County License Issued

License Number

Sworn to before me on: 10/16/15  
Date

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I, Dominick Fertitta, President, being duly sworn, state that I have read  
*Enter Your Name*

and understand all the items contained in the vendor questionnaire and any submission of change as identified on page one of this form and certify that as of this date, these items have not changed. I further certify that, to the best of my knowledge, information and belief, those answers are full, complete, and accurate; and that, to the best of my knowledge, information, and belief, those answers continue to be full, complete, and accurate.

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**Certified By:**

Dominick Fertitta  
 Name (Print)

President  
 Title

National Environmental Safety Co. Inc.  
 Name of Submitting Entity

[Signature]  
 Signature

10/16/2015  
 Date

**Notarized By:**

Jamie Rivera  
 Notary Public

JAMIE RIVERA  
 Notary Public - State of New York  
 No. 01R16245854  
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 Comm. Exp. August 8, 2019

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Vendor's EIN or TIN: 11-293 9703 Requesting Agency: NYC PDC

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*This form must be signed and notarized. Please complete this twice. Copies will not be accepted.*

**Certified By:**

Dominick Fertitta  
Name (Print)

President  
Title

National Environmental Safety Co. Inc.  
Name of Submitting Entity

[Signature]  
Signature

10/16/2015  
Date

**Notarized By:**

Jamie Rivera  
Notary Public

JAMIE RIVERA  
Notary Public - State of New York  
No. 01RI6245854  
Bronx County  
Comm. Exp. August 8, 2019

County License Issued

License Number

Sworn to before me on: 10/16/15  
Date

DIRECTIONS: Please execute two originals (both with original signature).  
Please forward directly to the agency (not M.O.C.S.).



## Certificate of No Change Form

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I, \_\_\_\_\_, being duly sworn, state that I have read  
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and understand all the items contained in the vendor questionnaire and any submission of change as identified on page one of this form and certify that as of this date, these items have not changed. I further certify that, to the best of my knowledge, information and belief, those answers are full, complete, and accurate; and that, to the best of my knowledge, information, and belief, those answers continue to be full, complete, and accurate.

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### **Vendor Questionnaire** *This section is required.*

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Name of Submitting Entity: \_\_\_\_\_

Vendor's Address: \_\_\_\_\_

Vendor's EIN or TIN: \_\_\_\_\_ Requesting Agency: \_\_\_\_\_

Are you submitting this Certification as a parent? (Please circle one)      Yes      No

Signature date on the last full vendor questionnaire signed for the submitting vendor: \_\_\_\_\_

Signature date on change submission for the submitting vendor: \_\_\_\_\_



# Principal Questionnaire

This section refers to the most recent principal questionnaire submissions.



Principal Name	Date of signature on last full Principal Questionnaire	Date(s) of signature on submission of change
1		
2		
3		
4		
5		
6		

Check if additional changes were submitted and attach a document with the date of additional submissions.

## Certification *This section is required.*

*This form must be signed and notarized. Please complete this twice. Copies will not be accepted.*

### Certified By:

\_\_\_\_\_  
Name (Print)

\_\_\_\_\_  
Title

\_\_\_\_\_  
Name of Submitting Entity

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

### Notarized By:

\_\_\_\_\_  
Notary Public

\_\_\_\_\_  
County License Issued

\_\_\_\_\_  
License Number

Sworn to before me on: \_\_\_\_\_  
Date

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- Please submit two completed forms. Copies will not be accepted.
- Please send both copies to the agency that requested it, unless you are advised to send it directly to the Mayor's Office of Contract Services (MOCS).
- A materially false statement willfully or fraudulently made in connection with this certification, and/or the failure to conduct appropriate due diligence in verifying the information that is the subject of this certification, may result in rendering the submitting entity non-responsible for the purpose of contract award.
- A materially false statement willfully or fraudulently made in connection with this certification may subject the person making the false statement to criminal charges

I, \_\_\_\_\_, being duly sworn, state that I have read  
*Enter Your Name*

and understand all the items contained in the vendor questionnaire and any submission of change as identified on page one of this form and certify that as of this date, these items have not changed. I further certify that, to the best of my knowledge, information and belief, those answers are full, complete, and accurate; and that, to the best of my knowledge, information, and belief, those answers continue to be full, complete, and accurate.

In addition, I further certify on behalf of the submitting vendor that the information contained in the principal questionnaire(s) and any submission of change identified on page two of this form have not changed and have been verified and continue, to the best of my knowledge, to be full, complete and accurate.

I understand that the City of New York will rely on the information supplied in this certification as additional inducement to enter into a contract with the submitting entity.

### **Vendor Questionnaire** *This section is required.*

*This refers to the vendor questionnaire(s) submitted for the vendor doing business with the City.*

Name of Submitting Entity: \_\_\_\_\_

Vendor's Address: \_\_\_\_\_

Vendor's EIN or TIN: \_\_\_\_\_ Requesting Agency: \_\_\_\_\_

Are you submitting this Certification as a parent? (Please circle one)    Yes    No

Signature date on the last full vendor questionnaire signed for the submitting vendor: \_\_\_\_\_

Signature date on change submission for the submitting vendor: \_\_\_\_\_

# Principal Questionnaire

*This section refers to the most recent principal questionnaire submissions.*



Principal Name	Date of signature on last full Principal Questionnaire	Date(s) of signature on submission of change
1		
2		
3		
4		
5		
6		

Check if additional changes were submitted and attach a document with the date of additional submissions.

## Certification *This section is required.*

*This form must be signed and notarized. Please complete this twice. Copies will not be accepted.*

### Certified By:

\_\_\_\_\_  
*Name (Print)*

\_\_\_\_\_  
*Title*

\_\_\_\_\_  
*Name of Submitting Entity*

\_\_\_\_\_  
*Signature*

\_\_\_\_\_  
*Date*

### Notarized By:

\_\_\_\_\_  
*Notary Public*

\_\_\_\_\_  
*County License Issued*

\_\_\_\_\_  
*License Number*

Sworn to before me on: \_\_\_\_\_  
*Date*

**IRAN DIVESTMENT ACT COMPLIANCE RIDER**  
**FOR NEW YORK CITY CONTRACTORS**

The Iran Divestment Act of 2012, effective as of April 12, 2012, is codified at State Finance Law (“SFL”) §165-a and General Municipal Law (“GML”) §103-g. The Iran Divestment Act, with certain exceptions, prohibits municipalities, including the City, from entering into contracts with persons engaged in investment activities in the energy sector of Iran. Pursuant to the terms set forth in SFL §165-a and GML §103-g, a person engages in investment activities in the energy sector of Iran if:

- (a) The person provides goods or services of twenty million dollars or more in the energy sector of Iran, including a person that provides oil or liquefied natural gas tankers, or products used to construct or maintain pipelines used to transport oil or liquefied natural gas, for the energy sector of Iran; or
- (b) The person is a financial institution that extends twenty million dollars or more in credit to another person, for forty-five days or more, if that person will use the credit to provide goods or services in the energy sector in Iran and is identified on a list created pursuant to paragraph (b) of subdivision three of Section 165-a of the State Finance Law and maintained by the Commissioner of the Office of General Services.

A bid or proposal shall not be considered for award nor shall any award be made where the bidder or proposer fails to submit a signed and verified bidder’s certification.

Each bidder or proposer must certify that it is not on the list of entities engaged in investment activities in Iran created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law. In any case where the bidder or proposer cannot certify that they are not on such list, the bidder or proposer shall so state and shall furnish with the bid or proposal a signed statement which sets forth in detail the reasons why such statement cannot be made. The City of New York may award a bid to a bidder who cannot make the certification on a case by case basis if:

- (1) The investment activities in Iran were made before the effective date of this section (i.e., April 12, 2012), the investment activities in Iran have not been expanded or renewed after the effective date of this section and the person has adopted, publicized and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran: or
- (2) The City makes a determination that the goods or services are necessary for the City to perform its functions and that, absent such an exemption, the City would be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

**BIDDER'S CERTIFICATION OF COMPLIANCE WITH  
IRAN DIVESTMENT ACT**

Pursuant to General Municipal Law §103-g, which generally prohibits the City from entering into contracts with persons engaged in investment activities in the energy sector of Iran, the bidder/proposer submits the following certification:

*[Please Check One]*

**BIDDER'S CERTIFICATION**

By submission of this bid or proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer 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, that each bidder/proposer is not on the list created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law.

I am unable to certify that my name and the name of the bidder/proposer does not appear on the list created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law. I have attached a signed statement setting forth in detail why I cannot so certify.

Dated: \_\_\_\_\_, New York  
\_\_\_\_\_, 20\_\_

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
PRINTED NAME

\_\_\_\_\_  
TITLE

Sworn to before me this  
\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_

\_\_\_\_\_  
Notary Public

Dated:

**BIDDER'S CERTIFICATION OF COMPLIANCE WITH  
IRAN DIVESTMENT ACT**

Pursuant to General Municipal Law §103-g, which generally prohibits the City from entering into contracts with persons engaged in investment activities in the energy sector of Iran, the bidder/proposer submits the following certification:

[Please Check One]

**BIDDER'S CERTIFICATION**

By submission of this bid or proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer 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, that each bidder/proposer is not on the list created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law.

I am unable to certify that my name and the name of the bidder/proposer does not appear on the list created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law. I have attached a signed statement setting forth in detail why I cannot so certify.

Dated: October New York  
16, 20 15

Mark Canellos  
SIGNATURE  
Mark Canellos  
PRINTED NAME  
Vice President  
TITLE

Sworn to before me this  
16<sup>th</sup> day of 10, 20 15

Jamie Rivera JAMIE RIVERA  
Notary Public Notary Public - State of New York  
No. 01RI6245854  
Bronx County  
Dated: 10/16/15 Comm. Exp. August 8, 2019

**CITY OF NEW YORK**

**DIVISION OF LABOR SERVICES**

**CONSTRUCTION EMPLOYMENT REPORT**

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

CONSTRUCTION EMPLOYMENT REPORT

GENERAL INFORMATION

1. Your contractual relationship in this contract is: Prime contractor  Subcontractor
- 1a. Are M/WBE goals attached to this project? Yes  No
2. Please check one of the following if your firm would like information on how to certify with the City of New York as a:
- Minority Owned Business Enterprise  Locally Based Business Enterprise  
 Women Owned Business Enterprise  Emerging Business Enterprise  
 Disadvantaged 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
3. Please indicate if you would like assistance from SBS in identifying certified M/WBEs for contracting opportunities: Yes  No
4. Is this project subject to a project labor agreement? Yes  No
5. Are you a Union contractor? Yes  No  If yes, please list which local(s) you affiliated with Carpenters, 79, Bricklayers, 78, 46, 7, 762
6. Are you a Veteran owned company? Yes  No

PART I: CONTRACTOR/SUBCONTRACTOR INFORMATION

7. 11-293 9703 Employer Identification Number or Federal Tax I.D. national@nesco.nyc Email Address
8. National Environmental Safety Co Inc. Company Name
9. 12-17 38<sup>th</sup> Avenue, LIC, NY 11101 Company Address and Zip Code
10. Mark Canellos Chief Operating Officer (718) 361-0044 Telephone Number
11. Same Designated Equal Opportunity Compliance Officer (If same as Item #10, write "same") (718) 361-0044 Telephone Number
12. Amo Name of Prime Contractor and Contact Person (If same as Item #8, write "same")

13. Number of employees in your company: 150 - 200

14. Contract information:

(a) NYCDDC  
Contracting Agency (City Agency)

(b) 7,962,064 (M)  
Contract Amount

(c) \_\_\_\_\_  
Procurement Identification Number (PIN)

(d) \_\_\_\_\_  
Contract Registration Number (CT#)

(e) \_\_\_\_\_  
Projected Commencement Date

(f) \_\_\_\_\_  
Projected Completion Date

(g) Description and location of proposed contract:

East Elmhurst Branch Library Expansion  
95-08 Astoria Blvd., Queens, NY 11369

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

If yes, attach a copy of certificate.

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

If yes, attach a copy of certificate.

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

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

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

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

If yes,

(a) Name and address of OFCCP office.

\_\_\_\_\_  
\_\_\_\_\_

(b) Was a Certificate of Equal Employment Compliance issued within the past 36 months?  
Yes\_\_\_ No\_\_\_

If yes, attach a copy of such certificate.

(c) Were any corrective actions required or agreed to? Yes\_\_\_ No\_\_\_

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

(d) Were any deficiencies found? Yes\_\_\_ No\_\_\_

If yes, attach a copy of such findings.

19. Is your company or its affiliates a member or members of an employers' trade association which is responsible for negotiating collective bargaining agreements (CBA) which affect construction site hiring? Yes 0 No\_\_\_

If yes, attach a list of such associations and all applicable CBA's. *BCA, IDCA, ECA, Carpenters, 79, DDC, Bricklayers, 78, 46, 7, 762*

## PART II: DOCUMENTS REQUIRED

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

- (a) Health benefit coverage/description(s) for all management, nonunion and union employees (whether company or union administered)
- (b) Disability, life, other insurance coverage/description
- (c) Employee Policy/Handbook
- (d) Personnel Policy/Manual
- (e) Supervisor's Policy/Manual
- (f) Pension plan or 401k coverage/description for all management, nonunion and union employees, whether company or union administered
- (g) Collective bargaining agreement(s).
- (h) Employment Application(s)
- (i) Employee evaluation policy/form(s).
- (j) Does your firm have medical and/or non-medical (i.e. education, military, personal, pregnancy, child care) leave policy?

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

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

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

Stored with National Environmental Safety Co Inc's  
Payroll Clerk - main office

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

If yes, is the medical examination given:

- (a) Prior to a job offer Yes  No
- (b) After a conditional job offer Yes  No
- (c) After a job offer Yes  No
- (d) To all applicants Yes  No
- (e) Only to some applicants Yes  No

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

all local TB asbestos handlers

24. Do you have a written equal employment opportunity (EEO) policy? Yes  No

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

National Environmental Safety's main office  
w/ payroll clerk

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

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

If yes, please attach a copy of this policy.

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

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

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

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

If yes, attach a log. See instructions.

29. Are there any jobs for which there are physical qualifications? Yes \_\_\_ No X

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

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

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

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SIGNATURE PAGE

I, (print name of authorized official signing) Mark Canellas, VP 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.

National Environmental Safety Co Inc.  
Contractor's Name

Mark Canellas Name of person who prepared this Employment Report  
Vice President Title

Same Name of official authorized to sign on behalf of the contractor  
Title

(718) 361-0044  
Telephone Number

Mark Canellas VP Signature of authorized official  
October 16, 2015 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/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 16<sup>th</sup> day of October 20 15

Jamie Rivera Notary Public JAMIE RIVERA  
Mark Canellas VP Authorized Signature  
Notary Public - State of New York Date 10/16/2015  
No. 01RI6245854  
Bronx County  
Comm. Exp. August 8, 2019

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

1. Do you plan to subcontract work on this contract? Yes  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
		T.B.D.		

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

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

**FORM B: PROJECTED WORKFORCE**

**TRADE CLASSIFICATION CODES**

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

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

Trade:

**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			BPD					BPD		
A										
Total Minority, Male & Female (Col. #2,3,4,5,7,8,9, & 10):										
Total Female (Col. #6 - 10):										
TRN										
TOT										

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

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**FORM C: CURRENT WORKFORCE**

**TRADE CLASSIFICATION CODES**

- (J) Journey/level Workers
- (H) Helper
- (TOT) Total by Column
- (A) Apprentice
- (TRN) Trainee

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

Trade:

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			BID						BID	
A										
TRN										
TOT										

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: \_\_\_\_\_

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				BPD					BPD	
TRN										
TOT										

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



13. Number of employees in your company: \_\_\_\_\_

14. Contract information:

(a) \_\_\_\_\_ (b) \_\_\_\_\_  
Contracting Agency (City Agency) Contract Amount

(c) \_\_\_\_\_ (d) \_\_\_\_\_  
Procurement Identification Number (PIN) Contract Registration Number (CT#)

(e) \_\_\_\_\_ (f) \_\_\_\_\_  
Projected Commencement Date Projected Completion Date

(g) Description and location of proposed contract:

\_\_\_\_\_  
\_\_\_\_\_

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

If yes, attach a copy of certificate.

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

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 \_\_\_ 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 \_\_\_

If yes,

(a) Name and address of OFCCP office.

\_\_\_\_\_

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

Yes\_\_\_ No\_\_\_

If yes, attach a copy of such certificate.

(c) Were any corrective actions required or agreed to? Yes\_\_\_ No\_\_\_

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

(d) Were any deficiencies found? Yes\_\_\_ No\_\_\_

If yes, attach a copy of such findings.

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

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

## PART II: DOCUMENTS REQUIRED

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

- \_\_\_ (a) Health benefit coverage/description(s) for all management, nonunion and union employees (whether company or union administered)
- \_\_\_ (b) Disability, life, other insurance coverage/description
- \_\_\_ (c) Employee Policy/Handbook
- \_\_\_ (d) Personnel Policy/Manual
- \_\_\_ (e) Supervisor's Policy/Manual
- \_\_\_ (f) Pension plan or 401k coverage/description for all management, nonunion and union employees, whether company or union administered
- \_\_\_ (g) Collective bargaining agreement(s).
- \_\_\_ (h) Employment Application(s)
- \_\_\_ (i) Employee evaluation policy/form(s).
- \_\_\_ (j) Does your firm have medical and/or non-medical (i.e. education, military, personal, pregnancy, child care) leave policy?

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

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

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

\_\_\_\_\_

\_\_\_\_\_

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

If yes, is the medical examination given:

- (a) Prior to a job offer Yes\_\_\_ No\_\_\_
- (b) After a conditional job offer Yes\_\_\_ No\_\_\_
- (c) After a job offer Yes\_\_\_ No\_\_\_
- (d) To all applicants Yes\_\_\_ No\_\_\_
- (e) Only to some applicants Yes\_\_\_ No\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

24. Do you have a written equal employment opportunity (EEO) policy? Yes\_\_\_ No\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

25. Does the company have a current affirmative action plan(s) (AAP)

- \_\_\_ Minorities and Women
- \_\_\_ Individuals with handicaps
- \_\_\_ Other. Please specify \_\_\_\_\_

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

If yes, please attach a copy of this policy.

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

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

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

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

If yes, attach a log. See instructions.

29. Are there any jobs for which there are physical qualifications? Yes\_\_\_ No\_\_\_

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

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

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

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**SIGNATURE PAGE**

I, (print name of authorized official signing) \_\_\_\_\_ 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.

\_\_\_\_\_  
Contractor's Name

\_\_\_\_\_  
Name of person who prepared this Employment Report Title

\_\_\_\_\_  
Name of official authorized to sign on behalf of the contractor Title

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Signature of authorized official 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/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 \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_\_

\_\_\_\_\_  
Notary Public Authorized Signature Date

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

1. Do you plan to subcontractor work on this contract? Yes \_\_\_ 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

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

**OWNERSHIP CODES**

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

**FORM B: PROJECTED WORKFORCE**

**TRADE CLASSIFICATION CODES**

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

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

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

Total (Col. #1-10): \_\_\_\_\_

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

Total Female  
(Col. #6 - 10): \_\_\_\_\_

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

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**FORM B-1 PROJECTED WORKFORCE**

Trade: \_\_\_\_\_

Union Affiliation, if applicable \_\_\_\_\_

Total (Col. #1-10): \_\_\_\_\_

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

Total Female  
(Col. #6 - 10): \_\_\_\_\_

**MALES**

(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.
J				
H				
A				
TRN				
TOT				

**FEMALES**

(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J				
H				
A				
TRN				
TOT				

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

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**FORM C: CURRENT WORKFORCE**

**TRADE CLASSIFICATION CODES**

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

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

Trade: \_\_\_\_\_

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

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

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**FORM C: CURRENT WORKFORCE**

Trade: \_\_\_\_\_

Union Affiliation, if applicable \_\_\_\_\_

Total (Col. #1-10): \_\_\_\_\_

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

Total Female  
(Col. #6 - 10): \_\_\_\_\_

**MALES**

(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.
J				
H				
A				
TRN				
TOT				

**FEMALES**

(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J				
H				
A				
TRN				
TOT				

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

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

September 15, 2015

**ADDENDUM No. # 1**

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

**LQQ122EE2**

**East Elmhurst Library Expansion**

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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.

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The bidder is advised that the items listed below apply to the project:


**1. Revisions to the Bid Booklet:**

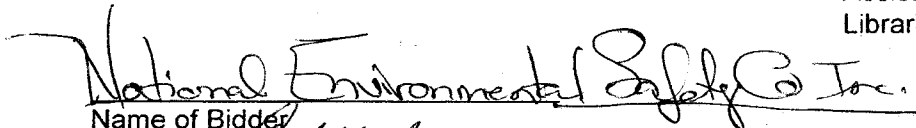
Bid Breakdown pages 21-1 through 21-34 are included with this Addendum.

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THIS ADDENDUM MUST BE SIGNED BY ALL BIDDERS AND ATTACHED TO THEIR BIDS.

If additional information is required, please contact the Department of Design and Construction, Contract Section at (718) 391-3170, (718) 391-1016, or by fax at (718) 391-2615.

  
\_\_\_\_\_  
Oscar Gonzalez  
Assistant Commissioner  
Libraries/Pass-Throughs and Grants

  
\_\_\_\_\_  
Name of Bidder

By:  \_\_\_\_\_





## NOTICE TO BIDDERS

**PROJECT #/DESCRIPTION: EAST ELMHURST BRANCH LIBRARY  
EXPANSION - BOROUGH OF QUEENS**

**THE BID OPENING FOR THE ABOVE-REFERENCED PROJECT  
SCHEDULED FOR FRIDAY, OCTOBER 02, 2015 AT 2:00 P.M. HAS BEEN  
POSTPONED UNTIL FURTHER NOTICE. AN ADDENDUM WILL SOON  
FOLLOW.**

**PLEASE MAKE NOTE OF THIS POSTPONEMENT.**

Company Name: National Environmental Safety Co. Inc.

Company Officer:   
Signature

**Please fax this acknowledgement receipt to 718-391-2615. If you have any questions,  
please call Emmanuel Charles at 718-391-3170 or Yamina Youb at 718-391-1016.**



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

September 30, 2015

**ADDENDUM No. # 2**

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

**LQQ122EE2**

**East Elmhurst Library Expansion**

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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.

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The bidder is advised that the items listed below apply to the project:

**1. Revised Bid Opening Date:**

The Bid Opening for the Contract described below scheduled for October 2, 2015 at 2:00pm is rescheduled to October 16, 2015 at 2:00pm.

Contract #1 – General Construction Work

**2. Questions from Bidders and Responses to Questions:**

See Attachment A.

**3. Revisions to the Specifications:**

See Attachment B.

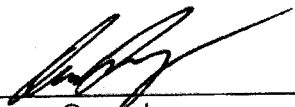
**4. Revisions to the Drawings:**

See Attachment C.

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**THIS ADDENDUM MUST BE SIGNED BY ALL BIDDERS AND ATTACHED TO THEIR BIDS.**

If additional information is required, please contact the Department of Design and Construction, Contract Section at (718) 391-3170, (718) 391-1016, or by fax at (718) 391-2615.

  
\_\_\_\_\_  
Oscar Gonzalez  
Assistant Commissioner  
Libraries/Pass-Throughs and Grants

National Environmental Safety Co. Inc.  
Name of Bidder

By: 

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

October 13, 2015

**ADDENDUM No. # 3**

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

**LQQ122EE2**

**East Elmhurst Library Expansion**

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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.

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The bidder is advised that the items listed below apply to the project:

**1. Questions from Bidders and Responses to Questions:**

See Attachment A.


**2. Revisions to the Specifications:**

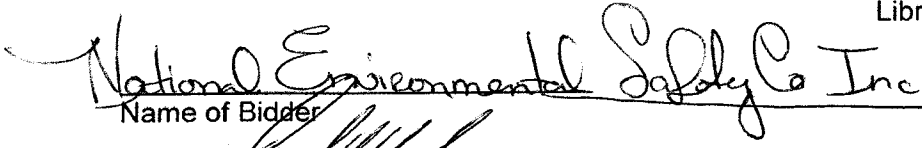
See Attachment B.

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**THIS ADDENDUM MUST BE SIGNED BY ALL BIDDERS AND ATTACHED TO THEIR BIDS.**

If additional information is required, please contact the Department of Design and Construction, Contract Section at (718) 391-3170, (718) 391-1016, or by fax at (718) 391-2615.

  
\_\_\_\_\_  
Oscar Gonzalez  
Assistant Commissioner  
Libraries/Pass-Throughs and Grants

  
\_\_\_\_\_  
Name of Bidder

By:  \_\_\_\_\_



FMS ID: LQQ122EE2



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**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](http://www.nyc.gov/buildnyc)

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**Contract for Furnishing all Labor and Material Necessary and Required for:**

**CONTRACT NO. 1            GENERAL CONSTRUCTION WORK**

# **East Elmhurst Branch Library Expansion**

**LOCATION:                      95-08 Astoria Boulevard  
BOROUGH:                    Queens 11369  
CITY OF NEW YORK**

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Contractor \_\_\_\_\_

Dated \_\_\_\_\_, 20 \_\_\_\_\_

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Entered in the Comptroller's Office \_\_\_\_\_

First Assistant Bookkeeper \_\_\_\_\_

Dated \_\_\_\_\_, 20 \_\_\_\_\_





PROJECT ID: LQQ122EE2

**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](http://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

**East Elmhurst Branch Library  
Expansion**

LOCATION:  
BOROUGH:  
CITY OF NEW YORK

95-08 Astoria Boulevard  
Queens 11369

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

Queens Public Library

Garrison Architects

Date: December 30, 2014



5-101





**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](http://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







## **2015 Project Labor Agreement**

### **NOTICE: THIS CONTRACT IS SUBJECT TO A NEW PROJECT LABOR AGREEMENT EXECUTED IN 2015**

**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 the attached Letter of Assent prior to award. 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. Contractor will also be required to have all subcontractors of all tiers execute the attached Letter of Assent prior to such subcontractors performing any work on the Project. 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. All bidders should carefully read the entire PLA that governs this Contract.**

**In addition, please note that there are significant revisions between the 2015 PLA attached to this bid and the prior Citywide Renovation PLA. The Contractor is urged to review the entire PLA. Significant changes include:**

- **Micro Work Orders:** For JOCS and Requirements contracts, Task Orders or Work Orders that do not exceed \$10,000 are not subject to the PLA. See PLA Article 3, Section 1.
- **On Call Contracts:** Provisions have been added regarding the referral of workers for on call contracts where Contractors are required to respond on an expedited basis. See PLA Article 4, Section 8.
- **Grievances:** The grievance procedure governing disputes under the PLA has been clarified. See PLA Article 9, Section 1.
- **Delinquent Contractors:** Contractors and Subcontractors who do not make required payments to union funds on a timely basis are subject to requirements to submit cancelled checks or another form of proof of payment in addition to certified payroll reports when requesting payment. See PLA Article 11, Section 2.
- **Payment to Union Funds for Non-Union Workers:** 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 “core” non-union employees (working pursuant to Article 4, Section 2 of the PLA) who are already covered under such bona fide private benefit plans. See PLA Article 11, Section 2.
- **Veterans Day:** Veterans Day has been added to the list of standard holidays. See Article 12, Section 4.
- **Reporting Pay for Weather Events:** 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 Article 12, Section 6.

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, 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.

In addition to the various provisions regarding work rules, Contractors should take special note of the requirement that Contractors and Subcontractors make payments to designated employee benefit funds. See PLA Article 11, Section 2. The PLA also contains provisions for what occurs when a Contractor or a subcontractor fails to make required payments into the benefit funds, including potentially the direct payment by the City to the benefit fund of monies owed and corresponding withholding of payments to the Contractor. See PLA Article 11, Section 2. The City strongly advises Contractors to read these provisions carefully and to include appropriate provisions in subcontracts addressing these possibilities.

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 in Schedule B entitled the "Subcontractor Utilization Plan," and are detailed in a separate Notice to Prospective Contractors included with 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 2(C), carefully. A list of certified M/WBE firms may be obtained from the Department of Small Business Services (DSBS) website at [www.nyc.gov/getcertified](http://www.nyc.gov/getcertified), by emailing DSBS at [MWBE@sbs.nyc.gov](mailto:MWBE@sbs.nyc.gov), by calling the DSBS certification hotline at (212) 513-6311, or by visiting or writing DSBS at 110 William St., 7<sup>th</sup> floor, New York, New York, 10038.

The local collective bargaining agreements (CBAs) that are incorporated into the PLA as PLA Schedule A Agreements are available on computer disk from the Department's 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.

A contact list for the participating unions is set forth after the FAQs.

Below are answers to frequently asked questions (FAQs) about this PLA:

1. **Q.** Does a Contractor need to be signatory with the unions in the NYC Building and Construction Trades Council 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.
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 must agree to become party to the PLA. See PLA Art. 2, Sec. 8. Subject to the Department'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 and agrees to the terms of the PLA.
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. Subcontractors, however, will be required to sign the Letter of Assent prior to being approved by the Department.
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. See PLA Article 4. However, Contractors and subcontractors may continue to use up to 12% of their existing, qualifying labor force for this work, in accordance with the terms of PLA Article 4, Section 2B. Certified M/WBEs for which participation goals are set pursuant to NYC Administrative Code §6-129 that are not signatory to any Schedule A CBAs may use their existing employees for the 2nd, 4th, 6th and 8th employee needed on the job if their contracts are valued at or under \$500,000. For contracts valued at above \$500,000 but under \$1,000,000, such certified M/WBEs may use their own employees for the 2nd, 5th and 8th employees needed on the job in accordance with the provisions of PLA Article 4, Section 2C. If additional workers are needed by these M/WBEs, the additional workers will be referred to the Contractor from the signatory local unions subject to the Contractor's right to meet 12% of the additional needs with its existing, qualifying employees.
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 2C?  
**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 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 projects 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 collective bargaining agreements (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. Non-union employees working under the PLA are subject to the union security provisions (i.e., union dues/agency shop fees) of the local CBAs while on the project. These 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.** When will the agency shop dues payer affiliate workers 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 agency shop dues payer affiliate workers should speak with the respective union(s) as to benefit eligibility thresholds.
10. **Q.** Are all Contractors and subcontractors working under the PLA, including non-union Contractors and Contractors signatory to collective bargaining agreements 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. See PLA Article 11, Section 2. 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 D.

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 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 Section 220. See PLA Article 11, Section 2.

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. May a contractor discharge a union referral for lack of productivity?

A. Again, 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.

15. 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.
16. 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 and may not be altered by the Contractor.
17. Q. Does the PLA create a common holiday schedule for all the signatory trades?  
A. Yes, the PLA recognizes nine (9) common holidays, including Veterans Day. See PLA Article 12, Section 4.
18. 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.
19. 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.
20. 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.
21. 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.
22. Q. Does the PLA contain special provisions for the manning 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.
23. 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.
24. 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.
25. 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.
26. 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 Project Labor Agreements 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.
27. 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.
28. 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. See PLA Article 10. A copy of the NY Plan is available upon request from the

Department. 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, Section 3.

29. **Q.** Does the 2015 Renovation 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 \$10,000 issued under JOCS or Requirements Contracts otherwise subject to the PLA. See PLA Article 3, Section 1.

# **NYC Project Labor Agreements**

## **CONTACT INFORMATION FOR LOCAL UNIONS**

### **BOILER MAKERS LOCAL NO. 5**

24 Van Siclen Avenue  
Floral Park, NY 11001  
Phone: (516) 326-2500  
Fax: (516) 326-3435  
Business Manager: Steve Ludwigson

### **BLASTERS & DRILLERS LOCAL NO. 29**

43-12 Ditmars Blvd.  
Astoria, NY, 11105  
Phone: (718) 278-5800  
Business Manager: Thomas Russo

### **BRICKLAYERS LOCAL NO. 1**

4 Court Square #1  
Long Island City, NY 11101  
Phone: (718) 392-0525  
Business Manager: Jeramiah Sullivan

### **CARPENTERS DISTRICT COUNCIL**

395 Hudson Street, 9<sup>th</sup> Fl  
New York, New York 10014  
Phone: (212) 366-7500  
Fax: (212) 675-3140  
Business Manager: Joe Geiger  
John Sheehy, D.C. Rep.

### **CEMENT MASONS NO. 780**

150-50 14th Rd Suite 4  
Whitestone, NY 11357  
Phone: (718) 357-3750  
Fax: (718) 357-2057  
Business Manager: Gino Castingnoli

### **CONCRETE WORKERS DISTRICT COUNCIL NO. 16**

29-18 35th Avenue  
Long Island City, NY 11106  
Phone: (718) 392-5077  
Fax: (718) 392-5087  
Business Manager: Alex Castaldi

**DERRICKMEN AND RIGGERS LOCAL 197**

35-53 24th Street  
Long Island City, NY 11101  
Phone: (718) 361-6534  
Fax: (718) 361-6584  
William Hayes Bus. Manager  
Billhayes197@yahoo.com

**DRYWALL TAPERS 1974**

265 West 14th Street  
New York, NY 10011  
Phone: (212) 242-8500  
Fax: (212) 242-2356  
Business Manager: Sal Marsala

**ELECTRICAL LOCAL NO. 3**

158-11 Harry Van Arsdale, Jr. Avenue  
Flushing, NY 11365  
Phone: (718) 591-4000  
Fax: (718) 380-8998  
Business Manager: Chris Erickson  
Raymond Melville, Asst. Bus. Mgr.  
Construction

**ELEVATOR CONSTRUCTORS NO. 1**

47-24 27th Avenue  
Long Island City, NY 11101  
Phone: (718) 767-7004  
Fax: (718) 767-6730  
Business Manager: Lenny Legotte  
llegotte@localoneiuec.com

**ENGINEERS LOCAL UNION NO. 14**

141-57 Northern Boulevard  
Flushing, NY 11354  
Phone: (718) 939-0600  
Fax: (718) 939-3131  
Business Manager: Edwin Christian

**ENGINEERS NO. 15, 15A, 15B, 15C, 15D**

265 West 14th Street  
New York, NY 10011  
Phone: (212) 929-5327-8-9  
Fax: (718) 729-3070  
Business Manager: Tom Callahan

**ENGINEERS NO. 30**

115-06 Myrtle Avenue  
Richmond Hill, NY 11418  
Phone: (718) 847-8484  
Fax: (718) 850-0524  
Business Manager: William Lynn

**ENGINEERS No. 94**

331-337 West 44<sup>th</sup> Street  
New York, NY 10036  
Phone: (212) 245-7040  
Fax: (212) 245-7886  
Business Manager: Kuba Brown  
kubabrown@local94.com

**GLAZIERS NO. 1087**

45 West 14<sup>th</sup> Street  
New York, NY 10011  
Phone: (212) 924-5200  
Fax: (212) 255-1151  
Business Manager: Joseph Azzopardi

**HEAT & FROST INSULATORS  
AND ALLIED WORKERS  
LOCAL UNION NO. 12**

35-53 24<sup>th</sup> Street  
Long Island City, NY 11101  
Phone: (718) 784-3456  
Fax: (718) 784-8357  
Business Manager: Matty Aracich  
matty@insulatorslocal12.com

**HEAT & FROST INSULATORS  
LOCAL UNION NO. 12A**

1536 127<sup>th</sup> Street  
College Point, NY 11356  
Phone: (718) 886-7226  
Business Manager: Jaime Soto

**IRON WORKERS DISTRICT**

505 White Plains Road, Suite 200  
Tarrytown, NY 10591  
Phone: (914) 332-4430  
Fax: (914) 332-4431  
Business Manager: Edward Walsh  
iwnys@verizon.net

**IRON WORKERS NO. 40 (Manhattan, The Bronx & Staten Island)**

451 Park Avenue South

New York, NY 10016

Phone: (212) 889-1320

Fax: (212) 779-3267

Business Manager: Bob Walsh

**IRON WORKERS NO. 361 (Brooklyn & Queens)**

89-19 97<sup>TH</sup> Avenue

Ozone Park, NY 11416

Phone: (718) 322-1016-17

Fax: (718) 322-1053

Business Manager: Matthew Chartrand

**LABORERS LOCAL NO. 78**

**ASBESTOS & LEAD ABATEMENT**

30 Cliff Street

New York, New York 10038-2825

Phone: (212) 227-4803

Fax: (212) 406-1800

Business Manager: Edison Severino

**LABORERS, CONSTRUCTION AND  
GENERAL BUILDING NO. 79**

520 8<sup>th</sup> Avenue

New York, NY 10018

Phone: (212) 465-7900

Fax: (212) 465-7903

Business Manager: Michael Prohaska

**LABORERS NO. 731**

34-11 35<sup>th</sup> Avenue

Astoria, NY 11106

(718) 706-0720

Business Manager: Joseph D'Amato

**LATHERS METAL**

**LOCAL NO. 46**

1322 Third Avenue

New York, NY 10021

Phone: (212) 737-0500

Fax: (212) 249-1226

Business Manager: Terrance Moore

**MASON TENDERS DIST. COUNCIL**

520 8th Avenue  
New York, NY 10018  
Phone: (212) 452-9400  
Fax: (212) 452-9499  
Business Manager: Robert Bonanza

**METAL POLISHERS  
LOCAL UNION NO. 8A**

36-18 33rd Street 2nd Fl.  
Long Island City, 11106  
Phone: (718) 361-1770  
Fax: (718) 361-1934  
Business Manager: Hector Lopez

**MILLWRIGHT AND MACHINERY  
ERECTORS LOCAL NO. 740**

89-07 Atlantic Avenue  
Woodhavaen, NY 11412  
Phone: (718) 849-3636  
Fax: (718) 849-0070  
Business Manager: Joseph Geiger

**ORNAMENTAL IRON WORKERS  
NO. 580**

501 West 42nd Street  
New York, NY 10036  
Phone: (212) 594-1662  
Fax: (212) 564-2748  
Business Manager: Pete Myers

**PAINTERS DISTRICT  
COUNCIL NO. 9**

45 West 14th Street  
New York, NY 10011  
Phone: (212) 255-2950  
Fax: (212) 255-1151  
Business Manager: Joseph Ramaglia

**PAINTERS STRUCTURAL STEEL  
NO. 806**

40 West 27th Street  
New York, New York 10001  
Phone: (212) 447-1838/0149  
Fax: (212) 545-8386  
Business Manager: Angelo Serse

**PAVERS & ROAD BUILDERS  
DISTRICT COUNCIL NO. 1**

136-25 37<sup>TH</sup> Avenue, Suite 502  
Flushing, NY 11354  
Phone: (718) 779-8850  
Fax: (718) 779-8857  
Business Manager: Keith Lozcalzo

**PLASTERS LOCAL UNION NO. 262**

2241 Conner Street  
Bronx, NY 10466  
Phone: (718) 547-5440  
Fax: (718) 547-5435  
Business Manager: Michael Hubler

**PLUMBERS NO. 1**

158-29 Cross Bay Boulevard  
Howard Beach, NY 11414  
Phone: (718) 738-7500  
Fax: (718) 835-0896  
Business Manager: John Murphy

**PRIVATE SANITATION  
LOCAL NO. 813**

45-18 Court Sq., Suite 600  
Long Island City, NY 11101  
Phone: (718) 937-7010  
Fax: (718) 937-7003  
Business Manager: Sean Campbell

**ROOFERS & WATERPROOFERS NO. 8**

12-11 43<sup>rd</sup> Avenue  
Long Island City, NY 11101  
Phone: (718) 361-1169  
Fax (718) 361-8330  
Business Manager: Nick Siciliano

**SHEET METAL WORKERS  
LOCAL NO. 28**

MANHATTAN OFFICE  
500 Greenwich Street  
New York, NY 10013  
Phone: (212) 941-7700  
Fax: (212) 226-0304  
Business Manager: Robert D'Orio



**SHEET METAL WORKERS  
LOCAL 137**

21-42 44<sup>th</sup> Drive  
Long Island City, NY 11101  
Phone: (718) 937-4514  
Fax: (718) 937-4113  
Business Manager: Dante Dano

**STEAMFITTERS LOCAL UNION  
NO. 638**

32-32 48<sup>th</sup> Avenue  
Long Island City, NY 11101  
Phone: (718) 392-3420  
Fax: (718) 784-7285  
Business Manager: Richard Roberts

**TEAMSTERS LOCAL UNION 282**

2500 Marcus Avenue  
Lake Success, NY 11042  
Phone: (516) 488-2822  
Fax: (516) 488-4895  
Business Manager: Tom Gesauldi

**TEAMSTERS LOCAL UNION 814**

21-42 44<sup>th</sup> Drive  
Long Island City, NY 11101  
Phone: (718) 609-6407  
Fax: (718) 361-9610  
Business Manager: Jason Ide

**TILE, MARBLE & TERRAZO B.A.C.  
LOCAL UNION 7**

45-34 Court Square  
Long Island City, NY 11101  
Phone: (718) 786-7648  
Fax: (718) 472-2370  
Business Manager: Tom Lane

**TIMBERMEN LOCAL 1556**

395 Hudson Street  
New York, NY 10014  
Phone: (212) 242-1320  
Business Manager: Joseph Geiger

NYC AGENCY RENOVATION & REHAB OF CITY OWNED BUILDINGS/STRUCTURES  
PLA

**PROJECT LABOR AGREEMENT**

**COVERING SPECIFIED**

**RENOVATION & REHABILITATION  
OF CITY OWNED BUILDINGS AND STRUCTURES**

**2015 - 2018**

NYC AGENCY RENOVATION & REHAB OF CITY OWNED BUILDINGS/STRUCTURES  
PLA

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**PROJECT LABOR AGREEMENT COVERING SPECIFIED  
RENOVATION & REHABILITATION OF NEW YORK CITY OWNED  
FACILITIES & 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;



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- (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) ensuring a reliable source of skilled and experienced labor; and
- (9) 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, 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”) (on behalf of itself) and the signatory affiliated Local Union’s (“Unions” or “Local Unions”). The Council and each signatory Local Union hereby warrants and represents that it has been duly authorized to enter into this Agreement.

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**ARTICLE 2 - GENERAL CONDITIONS**

**SECTION 1. DEFINITIONS**

Throughout this Agreement, the various Union parties including the Building and Construction Trades Council of Greater New York and Vicinity and its participating affiliated Local Unions, are referred to singularly and collectively as "Union(s)" or "Local Unions"; 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; "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); the New York City Agency that awards a particular contract subject to this Agreement may be referred to hereafter as the "Agency"; 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; the Building and Construction Trades Council of Greater New York and Vicinity is referred to as the ["BCTC" or "Council"]; and the work covered by this Agreement (as defined in Article 3) is referred to as "Program Work."

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**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 his 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 appended hereto as Schedule A, represents the complete understanding of all signatories and supersedes any national agreement, local agreement or other collective bargaining agreement of any type which would otherwise apply to this Program Work, in whole or in part, except that Program Work which falls within the jurisdiction of the Operating

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Engineers Locals 14 and 15 will be performed under the terms and conditions set out in the Schedule A agreements of Operating Engineers Locals 14 and 15. The Collective Bargaining Agreements 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 Collective Bargaining Agreements 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 Agreement is also covered by a Schedule A Collective Bargaining Agreement, the provisions of this 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 on this Program Work unless endorsed in writing by the Construction Manager or such other designee as may be designated by the Agency.

**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

NYC AGENCY RENOVATION & REHAB CITY OWNED  
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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 Program.

**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.

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**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**

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 let prior to December 31, 2018. Subject to the foregoing, and the exclusions below, such Program Work shall mean any and all contracts that predominantly involve the renovation, repair, alteration, 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. This Program Work shall also include JOCS contracts, demolition work, site work, asbestos and lead abatement, painting services, carpentry services, and carpet removal and installation, to the extent incidental to such building rehabilitation of City-owned buildings or structures.

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

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1. 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, 2018;
2. Contracts procured on an emergency basis;
3. Contracts that do not exceed \$250,000;
4. Contracts for work on streets and bridges and for the closing or environmental remediation of landfills;
5. Contracts with not-for-profit corporations where the City is not awarding or performing the work performed for that entity;
6. Contracts with governmental entities where the City is not awarding or performing the work performed for that entity;
7. 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;
8. Contracts for installation of information technology that are not otherwise Program Work;
9. Task Orders or Work Orders issued under JOCS or Requirements Contracts that do not exceed \$10,000, and JOCS or Requirements Contracts where the monetary value of such contracts predominantly involves such Task Orders or Work

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Orders; and

10. Contracts that do not exceed \$1 Million that are awarded pursuant to prequalified lists (PQLs) established by City agencies where entry on to the PQL is restricted to MWBEs, or a combination of MWBEs together with joint ventures which include at least one MWBE, or contractors who agree to subcontract at least 50% of the contract to MWBEs.

**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, 2018, 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 (excluding general and forepersons specifically covered by a craft's Schedule A), 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,



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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 Program 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 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

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other professional consultants, and such laboratory, testing, inspection or surveying firm;  
and

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.

**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.

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**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 employ and hire craft employees for Program Work covered by this Agreement through the job referral systems and hiring halls established in the Local Unions' area collective bargaining agreements. 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 is unable to 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.

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B. A Contractor may request by name, and the Local will honor, referral of persons 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 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 contracts valued at or under five hundred thousand (\$500,000), may request by name, and the Local will honor, referral of the second (2<sup>nd</sup>), fourth (4<sup>th</sup>), sixth (6<sup>th</sup>), and eighth (8<sup>th</sup>) 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 180 work days prior to the contract award.

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For such contracts valued at above \$500,000 but less than \$1 million, the Local will honor referrals by name of the second (2<sup>nd</sup>), fifth (5<sup>th</sup>), and eighth (8<sup>th</sup>) employee subject to the foregoing requirements. In both cases, name referrals will thereafter be in accordance with Section 2(B), above.

D. Where a certified MWBE Contractor voluntarily enters into a Collective Bargaining Agreement ("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

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specifications, within 48 hours of the request for same, the Contractor may employ qualified minority or female applicants from any other available source.

In the event that the City or a City agency determines to adopt local workforce participation goals to be set forth in an Agency's (or, if applicable Construction Manager's) bid specifications, the City and BCTC will work together to seek agreement on appropriate goals to be set forth in applicable bid documents and to be subject to the provisions 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 will acknowledge the Section 3 obligations of the Construction Manager or Contractor, as applicable, and agree to negotiate a method to 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

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will exert their utmost efforts to recruit sufficient numbers of skilled and qualified crafts employees to fulfill the requirements of the Contractor.

**SECTION 6. UNION DUES**

All employees covered by this Agreement shall be subject to the union security provisions contained in the applicable Schedule A local agreements, as amended from time to time, but only for the period of time during which they are performing on-site Program Work and only to the extent of tendering payment of the applicable union dues and assessments uniformly required for union membership in the Local Unions which represent the craft in which the employee is performing Program Work. No employee shall be discriminated against at any Program Work site because of the employee's union membership or lack thereof. In the case of unaffiliated employees, the dues payment will be received by the Local Unions as an agency shop fee.

**SECTION 7. 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, 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 Collective Bargaining Agreement prohibits a foreperson from working when the craft persons he is leading exceed a specified number.

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**SECTION 8. ON CALL REPAIR REFERRALS**

A. When an Agency awards a contract 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 it 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. 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.



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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 Work site during such time as bargaining unit work is occurring and subject to otherwise applicable policies pertaining to visitors to the site.

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**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 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.

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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,

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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 disruptive activity at the Program Work site for any reason by any Union or employee against any Contractor or employer. There

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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

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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

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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.

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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 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 minority and female employees.

**SECTION 2. COMPOSITION**

The Committee 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 may mutually designate an



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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 Program Work Site if already commenced, and is available in the City Record and Notice to Proceed for projects not already commenced.

Grievances as to whether a scope of work is included or excluded from this Agreement shall be submitted to the Labor Management Committee (LMC) in the first instance rather than Step 1 below. To be timely, such notice must be given no later than ten days prior to a bid opening if the grievance is challenging a determination by an Agency that the contract is not subject to this Agreement. For other grievances as to contractor 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:**

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(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:**

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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, 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.

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(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.

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**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.

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**ARTICLE 11 - WAGES AND BENEFITS**

**SECTION 1. CLASSIFICATION AND BASE HOURLY RATE**

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

**SECTION 2. EMPLOYEE BENEFITS**

A. The Contractors agree to pay on a timely basis contributions on behalf of all employees covered by this Agreement to those established jointly trustee employee benefit funds designated in the applicable Collective Bargaining Agreements in Schedule A (in the appropriate Schedule A amounts), provided that such benefits are required to be paid on public works under any applicable prevailing wage law. Bona fide jointly trustee fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added if similarly required under applicable prevailing wage law. Contractors, not otherwise contractually bound to do so, shall not be required to contribute to benefits, trusts or plans of any kind which are not required by the prevailing wage law provided, however, that this provision does not relieve Contractors signatory to local collective bargaining agreement with any affiliated union from complying with the fringe benefit requirements for all funds contained in the CBA.

B. 1. Notwithstanding Section 2 (A) above, and subject to 2 (B)(2) below, Contractors who designate employees pursuant to Article 4, Section 2 (B) and (C) ("core" employees) 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 Labor Law, may

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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)(1) above. The Contractor shall also provide certification from a certified public accountant as to the annualized hourly value of such benefits consistent with the requirements of Section 220.

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

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of Assent, satisfy its obligations for all employees, including core employees, by contributing to the Schedule A benefit plans in accordance with the terms of the Schedule A Agreements.

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

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](http://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



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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

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law and the PLA 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 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

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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.

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**ARTICLE 12- HOURS OF WORK, PREMIUM PAYMENTS,**

**SHIFTS AND HOLIDAYS**

**SECTION 1. WORK WEEK AND WORK DAY**

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 work day must be established at the commencement of the project and may not be altered by the Contractor.

B. In accordance with Program 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.

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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 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 (7 ½) 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

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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 work days notice to the Local Union or such lesser notice as may be mutually agreed upon.

B. Second and/or Third Shifts/Saturday and/or Sunday Work - - The second shift shall start between 3 p.m. and 6 p.m. and the third shift shall start between 11 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. 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., 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 a classification performing Program Work will be paid at the same wage rate regardless of the shift or work scheduled work, subject only to the foregoing provisions.

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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 recognized holiday shall be in accordance with the applicable Schedule A.

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

**SECTION 5. SATURDAY 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

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a regularly scheduled weekday, the Contractor may schedule a Saturday make-up day and such time shall be scheduled and paid as if performed on a weekday. Any other Saturday work shall be paid at time and one-half (1½). The Contractor shall notify the Local Union on the missed day or as soon thereafter as practicable if such a make-up day is to be worked.

**SECTION 6. REPORTING PAY**

A. Employees who report to the work location pursuant to their regular schedule and who are not provided with work shall be paid two hours reporting pay at straight time rates. An employee whose work is terminated early by a Contractor due to severe weather, power failure, fire or natural disaster or for similar circumstances beyond the Contractor's control, shall receive pay only for such time as is actually worked. In other instances in which an employee's work is terminated early (unless provided otherwise elsewhere in this Agreement), the employee shall be paid for his 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



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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.

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**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 work day 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 brassing or other systems to check employees in and out. Each employee must check in and out. 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

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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**

**SECTION 1. RATIOS**

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 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. 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 and Helmets to Hardhats.

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**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.

**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 this 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.

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**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**

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 this 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). 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, age or any other status provided by law, in any manner prohibited by law or regulation.

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**SECTION 2. LANGUAGE OF AGREEMENT**

The use of the masculine or feminine gender in this Agreement shall be construed as including both genders.

**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.

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**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 WORK DAY**

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 NYS Department of Labor, 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,

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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 Program 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



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basis, or is otherwise determined to be in violation of law, or may cause the loss of Program 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.

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**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 Collective Bargaining Agreements that are the basis for the Schedule A notify the Agency and Construction Manager in writing of the changes agreed to in that Area Collective Bargaining which are applicable to work covered by this Agreement and their effective dates.

B. It is agreed that any provisions negotiated into Schedule A collective bargaining agreements 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 Collective Bargaining Agreements 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

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Local Collective Bargaining Agreements 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 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 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 the Program to create and maintain an integrated database of veterans interested in working on this Project and of

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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.

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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:  
Anthony Shorris  
First Deputy Mayor

APPROVED AS TO FORM:

\_\_\_\_\_  
ACTING CORPORATION COUNSEL  
NEW YORK CITY

LIST OF SIGNATORY UNIONS
Boiler Makers Local No. 5
Carpenters District Council
Cement Masons No. 780
Concrete Workers, District Council No. 16
Derrickmen and Riggers, Local Union No. 197
Drywall Tapers 1974, District Council 9
Electrical Workers Local No. 3
Glaziers Local Union No. 1087 District Council 9
Heat & Frost Insulators, Local Union No. 12A
Heat & Frost Insulators, Local Union No. 12
Iron Workers District Council
Iron Workers Local Union No. 40
Iron Workers Local No. 361
Laborers Local No. 78, Asbestos & Lead Abatement
Laborers Local 1010 Pavers and Road Builders District Council
Laborers 79 Construction and General Building Laborers
Laborers Local No. 731 Excavators
Mason Tenders District Council
Metal Lathers Local No. 46
Metal Polishers District Council 9
Ornamental Iron Workers Local No. 580
Painters District Council 9
Plumbers Local No. 1
Painters, Decorators & Wallcoverers District Council 9
Painters Structural Steel No. 806
Plasterers Local Union No. 262
Roofers & Waterproofers Local 8
Steamfitters Local Union No. 638
Sheet Metal Workers Local No. 28
Sheet Metal Workers Local No. 137
Teamsters Local Union No. 282
Teamsters Local Union 814
Teamsters Local No. 813 Private Sanitation
Tile, Marble & Terrazzo B.A.C. Local Union No. 7

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SCHEDULE "A"

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.
District Council No. 9, I.U.P.A.T Glaziers Local 1087	Window and Plate Glass Dealers Association
Drywall Tapers and Pointers 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
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

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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
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



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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
Teamsters Local 814	Greater New York Movers and Warehousemen's Bargaining Group
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

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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

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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

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United Derrickmen & Riggers Association, Local 197 of NY, LI, Westchester & Vicinity	Contracting Stonesetters Association Inc.
United Derrickmen & Riggers Association L 197 of NY, LI, Westchester and Vicinity	Building Stone and Pre-cast Contractors Association
International Union of Operating Engineers Local 14-14B	Building Contractors Association
International Union of Operating Engineers Local 14-14B	Contractors Association of Greater NY
International Union of Operating Engineers Local 14-14B	GCA
International Union of Operating Engineers Local 14-14B	The Cement League
International Union of Operating Engineers Local 14-14B	Allied Building Metal Industries, Inc.
International Union of Operating Engineers Local 14-14B	Brick Association
International Union of Operating Engineers Local 14-14B	Independent
International Union of Operating Engineers Local 15	Allied Building Metal Industries, Inc.
International Union of Operating Engineers Local 15-15A	General Contractors Association
International Union of Operating Engineers Local 15D	General Contractors Association
International Union of Operating Engineers Local 15D	Structural Steel Erectors

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International Union of Operating Engineers Local 15-15A	Building Contractors Association
International Union of Operating Engineers Local 15D	Building Contractors Association
International Union of Operating Engineers Local 15-15A	Contractors Association of Greater NY
International Union of Operating Engineers Local 15D	Contractors Association of Greater NY
International Union of Operating Engineers Local 15-15A	The Cement League
International Union of Operating Engineers Local 15D	The Cement League

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**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 \_\_\_\_\_ 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:

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Dated: \_\_\_\_\_

\_\_\_\_\_  
(Name of Contractor or subcontractor)

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

\_\_\_\_\_  
(Authorized Officer & Title)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Phone) (Fax)

\_\_\_\_\_  
Contractor's State License  
# \_\_\_\_\_

Sworn to before me this  
\_\_\_\_ day of \_\_\_\_\_,

\_\_\_\_\_  
Notary Public



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**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 days 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.





# NOTICE TO BIDDERS

**Please be advised that the City of New York has issued a new Standard Construction Contract. The new Contract, which is incorporated in this bid, is significantly different from the 2008 version previously used by the City. A listing of some of the significant changes is provided below. This notice is only a partial listing. Please refer to the Contract itself for a full understanding of the changes and the actual text of the changes that were made. The text of the revised Standard Construction Contract is the controlling document should there be any discrepancies between this notice and the Standard Construction Contract.**

**Significant changes include the following:**

## **ARTICLE 11            DAMAGES CAUSED BY DELAYS**

In 2008, the City embarked on a pilot project to test the use of new construction contract language altering the allocation of the risk of project delays, as between the City and the contractor. The City has determined to make the pilot project language the standard language for all City construction contracts. Accordingly, there is now one Standard City Construction Contract that it to be used by all agencies for all bids released after the release of the new contract. The damages for delay language is Article 11. Please note that changes have been made to the damages for delay provisions from the pilot to the adopted version.

## **ARTICLE 22            INSURANCE**

Changes have been made to the insurance provisions, including incorporating requirements that the insurance provided comply with recent NYC Department of Buildings regulations specifying required dollar limits for CGL insurance for certain projects and requiring proof of builder's risk insurance prior to Work commencing rather than within 10 days of award.

**ARTICLE 26            EXTRA WORK**

The percentage paid for overhead for Extra Work pursuant to Section 26.1.11 is increased from 10% to 12% and the calculation of Worker's Compensation insurance costs reimbursed for Extra Work has been clarified.

**ARTICLE 37            LABOR LAW REQUIREMENTS**  
**ARTICLE 38            PAYROLL REPORTS**

The provisions governing Labor Law provisions have been tightened, including requirements the employee identification cards include a photo (unless the requirement is waived), a prohibition on cash payments to employees and subcontractors, and clear enforcement authority requirements.

**ARTICLE 70            ELECTRONIC FILING**

A provision is added to make mandatory the electronic filing of certain alteration permits with the Department of Buildings.

**Other significant changes include the following:**

**ARTICLE 7            INDEMNIFICATION**

Changes have been made to the indemnification provisions.

**ARTICLE 14            FINAL ACCEPTANCE OF WORK**  
**ARTICLE 44            SUBSTANTIAL COMPLETION PAYMENT**

The Commissioner is no longer required to issue a substantial completion determination in addition to the already existing requirement that the Engineer issue a substantial completion determination and reach an agreement on a punch list of remaining work. Now, the Engineer, when issuing the punch list to the Contractor, must also include a proposed schedule for the completion of the punch list. The Contractor may propose an alternative schedule that is subject to the approval of the Engineer. If the Contractor fails to respond to the Engineer's proposed schedule, the Engineer's schedule is deemed accepted.

**ARTICLE 15            LIQUIDATED DAMAGES**

The contract is revised to match Schedule A to provide that liquidated damages are available only until substantial completion.

**ARTICLE 17            SUBCONTRACTS**

The requirements for prior approval of subcontractors, and for contractors to be responsible for the actions of their subcontractors, have been tightened. The requirement that the Contractor list subcontractors in the City's Payee Information Portal has been added; the provision was previously attached as a rider.

**ARTICLE 19            SECURITY DEPOSIT**

The provisions governing the return of bid deposits are clarified.

**ARTICLE 20            PAYMENT GUARANTEE**

The Payment Guaranty provisions, which apply when the City does not require the Contractor to obtain payment bonds, has been significantly revised to track the requirements of State Finance law 137.

**ARTICLE 28            RECORDKEEPING FOR EXTRA OR DISPUTED WORK**

The recordkeeping requirement that currently apply to payments for Time & Materials for extra work are expressly made applicable to regular work that is paid for on a T & M basis.

**ARTICLE 35            EMPLOYEES**

The whistleblower provisions of local law are added to the construction contract. They previously have been attached as a rider.

**ARTICLE 38            PAYROLL REPORTS**  
**ARTICLE 77            RECORDS RETENTION**

Requirements that records be maintained for six years and directions on how such records must be made available.

**ARTICLE 42            PARTIAL PAYMENTS**

Increased flexibility has been provided for when contractors may submit invoices.

**ARTICLE 62            TAX EXEMPTION**

The provisions identifying the State tax exemption for municipalities are revised to more clearly describe State law.



**NEW YORK CITY STANDARD CONSTRUCTION CONTRACT (DEC. 2013)  
INSURANCE RIDER**

The following provisions supersede the corresponding provisions in the December 2013 version of the New York City Standard Construction Contract:

1. Section 22.1.1(c) provides as follows:

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 provided by the Agency in Schedule A. If the Work does not require such a permit, the minimum limits shall be those provided for in Schedule A.

2. Section 22.3.3 provides as follows:

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; and (d) the company code issued to the insurance company by the National Association of Insurance Commissioners (the NAIC number). All such Certificates of Insurance shall be accompanied by the required additional insured endorsements and 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.

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

**INFORMATION FOR BIDDERS**

**December 2013**



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## INFORMATION FOR BIDDERS

### 1. Description and Location of Work

The description and location of the work for which bids are requested are specified in Attachment 1, "Bid Information". Attachment 1 is included in the Bid Booklet.

### 2. Time and Place for Receipt of Bids

Sealed bids shall be received on or before the date and hour specified in Attachment 1, at which time they will be publicly opened and read aloud in the presence of the Commissioner or his 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, if used, 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 at the location set forth in Attachment 1.

(C) Deposit for Copy of Invitation For Bids Documents: Prospective bidders may obtain a copy of the Invitation For Bids Documents by complying with the conditions set forth in the Notice of Solicitation. The deposit must be in the form of a check or money order made payable to the City of New York, and drawn upon a state or national bank or trust company, or a check of such bank or trust company signed by a duly authorized officer thereof.

(D) Return of Invitation For Bids Documents: All Invitation For Bids Documents must be returned to the Department upon request. If the bidder elects not to submit a bid thereunder, the Invitation For Bids Documents shall be returned to the Department, along with a statement that no bid will be submitted.

(E) Return of Deposit: Such deposit will be returned within 30 days after the award of the contract or the rejection of all bids as set forth in the advertisement, provided the Invitation For Bids Documents are returned to the location specified in Attachment 1, in physical condition satisfactory to the Commissioner.

(F) Additional Copies: Additional copies of the Invitation For Bids Documents may be obtained, subject to the conditions set forth in the advertisement for bids.

5. Pre-Bid Conference

A pre-bid conference shall be held as set forth in Attachment 1. 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 Attachment 1.

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 Attachment 1.

(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 he 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 his 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 Attachment 1, 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 his option, may ask to be relieved of his 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.

(D) 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. VENDEX Questionnaires

(A) Requirement: Pursuant to Administrative Code Section 6-116.2 and the PPB Rules, bidders may be obligated to complete and submit VENDEX Questionnaires. Generally, if this bid is \$100,000 or more, or if this bid when added to the sum total of all contracts, concessions and franchises the bidder has received from the City and any subcontracts received from City contractors over the past twelve months, equals or exceeds \$100,000, Vendex Questionnaires must be completed. If required, Vendex Questionnaires must be completed and submitted before any award of contract may be made or before approval is given for a proposed subcontractor. Non-compliance with these submission requirements may result in the disqualification of the bid, disapproval of a subcontractor, subsequent withdrawal of approval for the use of an approved subcontractor, or the cancellation of the contract after its award.

(B) Submission: Vendex Questionnaires must be submitted directly to the Mayor's Office of Contract Services, ATTN: Vendex, 253 Broadway, 9<sup>th</sup> Floor, New York, New York 10007. In addition, the bidder must submit a Confirmation of Vendex Compliance to the agency. A form for this confirmation is set forth in the Bid Booklet.

(C) Obtaining Forms: Vendex Questionnaires, as well as detailed instructions, may be obtained at [www.nyc.gov/vendex](http://www.nyc.gov/vendex). The bidder may also obtain Vendex forms and instructions by contacting the Agency Chief Contracting Officer or the contact person for this contract.

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)669-2797.

26. Bid, Performance and Payment Security

(A) Bid Security: Each bid must be accompanied by bid security in an amount and type specified in Attachment 1. 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 Attachment 1. 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 Attachment 1. 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 202-512-1800; (2) through the Internet at <http://www.fms.treas.gov/c570/index.html>, and (3) through a computerized public bulletin board, which can be accessed by using your computer modem and dialing 202-874-6887.

(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 his 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 his 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 Bid Booklet.

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 Form, 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 to be considered part of this contract. The quantities actually required to complete the contract work may be less or more than so estimated, and if so, no action for damages or for loss of profits shall accrue to the contractor by reason thereof.

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

34. Excise Tax

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

35. Licenses and Permits

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

36. Multiple Prime Contractors

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

37. Locally Based Enterprise Requirements (LBE)

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

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

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

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

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

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

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

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

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

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

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

- (2) The following documents shall be attached to the "LBE Participation Schedule":
- (a) verification letters from each subcontractor listed in the "LBE Participation Schedule" stating that the LBE will enter into a formal agreement for work,
  - (b) certification documents of any proposed LBE subcontractor which is not on the LBE certified list, and
  - (c) copies of the certification letter of any proposed subcontractor which is an LBE.
- (3) Documentation of good faith efforts to achieve the required LBE percentage shall include as appropriate but not limited to the following:
- (a) attendance at prebid meetings, when scheduled by the agency, to advise bidders of contract requirements;
  - (b) advertisement where appropriate in general circulation media, trade association publications and small business media of the specific subcontracts that would be at least equal to the percentage goal for LBE utilization specified by the contractor;
  - (c) written notification to association of small, minority and women contractors soliciting specific subcontractors;
  - (d) written notification by certified mail to LBE firms that their interest in the contract is solicited for specific work items and their estimated values;
  - (e) demonstration of efforts made to select portions of the work for performance by LBE firms in order to increase the likelihood of achieving the stated goal;
  - (f) documented efforts to negotiate with LBE firms for specific subcontracts, including at a minimum:
    - (i) The names, address and telephone numbers of LBE firms that are contacted;
    - (ii) A description of the information provided to LBE firms regarding the plans and specifications for portions of the work to be performed;
    - (iii) Documentation showing that no reasonable price can be obtained from LBE firms;
    - (iv) A statement of why agreements with LBE firms were not reached;
  - (g) a statement of the reason for rejecting any LBE firm which the contractor deemed to be unqualified; and
  - (h) documentation of efforts made to assist the LBE firms contacted that needed assistance in obtaining required insurance.

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

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

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

38. Bid Submission Requirements

The Bid Submission Requirements are set forth on page 2 of the Bid Booklet.

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.

**CITY OF NEW YORK**  
**DEPARTMENT OF DESIGN AND CONSTRUCTION**  
**SAFETY REQUIREMENTS**

June 2015

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THE DDC SAFETY REQUIREMENTS INCLUDE THE FOLLOWING SECTIONS:

- I. POLICY ON SITE SAFETY
- II. PURPOSE
- III. DEFINITIONS
- IV. RESPONSIBILITIES
- V. SAFETY QUESTIONNAIRE
- VI. SAFETY PROGRAM AND SITE SAFETY PLAN
- VII. KICK-OFF/PRE-CONSTRUCTION MEETINGS AND SAFETY REVIEW
- VIII. EVALUATION DURING WORK IN PROGRESS
- IX. SAFETY PERFORMANCE EVALUATION

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## 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 jobsites must, at a minimum, comply with applicable federal, state and city laws, rules and regulations, including without limitation:

- U. S. Department of Labor 29 Code of Federal Regulations (CFR) Part 1926 and applicable Sub-parts of Part 1910 – U.S. Occupational Safety and Health Administration (OSHA); New York State Department of Labor Industrial Code Rule 23 – Protection in Construction, Demolition and Excavation;
- New York City Construction Codes, Title 28
- NYC Department of Transportation Title 34 Chapter 2 – Highway Rules
- New York State Department of Labor Industrial Code Rule 16 NYCRR Part 753
- Title 15 of the Rules of the City of New York, Chapter 13 Citywide Construction Dust Mitigation
- Manual on Uniform Traffic Control Devices (MUTCD)
- Title 15 of the Rules of the City of New York, Chapter 28 Citywide Construction Noise Mitigation

## I. 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 hazard, 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 shall mean the person delegated authority by the Commissioner to organize and supervise the procurement activity of subordinate Agency staff in conjunction with the 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.

**Construction Safety Auditor:** A representative of the QA&CS Construction Safety Unit 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 surveys, reviewing health and safety plans, reviewing construction permits, and rendering technical advice and assistance to DDC Resident Engineers and Project Managers.

**Construction Safety Unit:** A part of QA&CS within the Division of Program Management/ Safety & Site Support that assesses contractor safety on DDC jobsites and advises responsible parties of needed corrective actions.

**Construction Superintendent:** A representative of the contractor responsible for overseeing performance of the required construction work. This individual must engage in sound construction practices, and is responsible to maintain a safe work site. In the case of a project involving the demolition, alteration or new construction of buildings, the Construction Superintendent must be licensed by the NYC Department of Buildings.

**Contractor:** For purposes of these Safety Requirements, the term "Contractor" shall mean any person or entity that enters into a contract for the performance of construction work on a DDC project. The term "Contractor" shall 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").



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**Daily Safety Job Briefing:** Daily jobsite safety meetings, giving to all jobsite personnel by contractor, with the purpose of discussing project specific safety procedures for the scheduled construction work.

**Director - Quality Assurance and Construction Safety (QA&CS):** Responsible for the operations of the QACS Construction Safety Unit and the DDC Site Safety management programs.

**Job Hazard Analysis (JHA):** A process of identifying the major job steps and any potential site-specific hazards that may be present during construction and establishing the means and methods to eliminate or control those hazards.

**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 and trenching and shoring, 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 shall have completed an authorized 30 hour OSHA Construction Safety Course and other safety training applicable to Contractor's/subcontractor's project work. Except in instances where a dedicated Project Safety Manager is required, a Project Safety Representative may also function as a superintendent, foreman or crew leader on the Project, but must have sufficient experience and authority to undertake corrective actions and must qualify to be a competent person. No work is to be performed on site when a Project Safety Representative is not present.

**Project Safety Manager:** A dedicated, full-time project safety manager may be a contractual requirement on large projects or projects deemed by DDC to be particularly high risk. This would be in addition or in lieu of a Contractor's Project Safety Representative. This individual shall not have any other assigned duties. This individual shall have received, at a minimum an authorized 30 hour OSHA Construction Safety Course. Other examples of acceptable training are OSHA Safety and Health Standards for the Construction Industry training program (OSHA 510), Certified Safety Professional (CSP), Certified Industrial Hygienist (CIH) or a degree/certificate in a safety and health from a college-level curriculum.

A Project Safety Manager shall possess the additional training, years of experience, and skills necessary to thoroughly understand the health and safety hazards and controls for large construction projects, including the full scope of the specific Work.

**QA&CS** – Quality Assurance and Construction Safety of the New York City Department of Design and Construction.

**Resident Engineer (RE) / Construction Project Manager (CPM):** Representative of the Commissioner duly designated by the Commissioner to be his/her representative at the site of the work. (The RE/CPM may be a third-party consultant, including a Construction Management firm, retained by DDC)

**Safety Program:** Established by the Contractor that covers all operations of that Contractor and establishes the Contractor's overall safety policy, regulatory compliance plan and minimum safety standards. The Safety Program must be submitted prior to the commencement of work at the site and is subject to review and acceptance by the Construction Safety Unit.

**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 NYC Construction Codes – Title 28, the Contractor shall provide a Site Safety Manager with a Site Safety Manager License issued by the NYC Department of Building.

**Site Safety Plan:** A site-specific safety plan developed by the Contractor for a specific project. The Site Safety Plan must identify hazards associated with the project, and include specific safety procedures and training appropriate and

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necessary to complete the work. The Site Safety Plan must be submitted prior to the commencement of work at the site and is subject to review and acceptance by the Construction Safety Unit.

**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 documented 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.

**Work:** The construction required by the 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.

#### IV. RESPONSIBILITIES

All persons who manage, perform, and provide support for construction projects shall 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. DDC or CM Resident Engineer / Construction Project Manager

- Monitors the issuance of safety- related permits, approvals and drawings and maintains copies on site.
- Monitors construction-related work activities to confirm that they are conducted in accordance with DDC policies and all applicable regulations that pertain to construction safety.
- Maintains documentation and periodically attends weekly safety meetings and daily safety job briefings.
- Notifies the Construction Safety Unit and the ACCO's Insurance and Risk Management Unit of project- related accidents and emergencies, as per DDC's Construction Safety Emergency and Accident Notification and Response Protocol.
- Gathers facts related to all accidents and prepares DDC Construction Accident Report.
- Notifies the Construction Safety Unit within two (2) hours of the start of an inspection by any outside regulatory agency personnel, including OSHA, NYC DOB or others and forwards a copy of the inspection report within three days of its receipt.
- Monitors the conditions at the site for conformance with the contractor's Site Safety Plan and DDC construction documents.
- Notifies the contractor and DDC in the event that any condition or activity exists that 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.
- Notifies DDC of any unsafe or unhealthy condition and directs the contractor to provide such labor, materials, equipment and supervision to abate such conditions.
- Escort and assist QA&CS Construction Safety Auditors during the field and record inspections.
- Reports emergency conditions to the Construction Safety Unit immediately.

##### B. Contractors

- Submit a completed Safety Questionnaire and other safety performance related documentation with its bid or as part of a pre-qualification package.
- Complete a written Job Hazard Analysis (JHA) that identifies safety hazards for project specific work tasks and hazard control methods. A written JHA shall be available at the site for reference and included in the Site Safety Plan submitted by the contractor.
- Submit a Site Safety Plan and Safety Program within 30 days from the Award Date or as otherwise directed. The Site Safety Plan and Safety Program are subject to review and acceptance by the Construction Safety Unit prior to the commencement of work at the site. The Site Safety Plan shall be revised and updated as necessary.

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- Develop project specific safety procedures to protect general public during all construction activities for the duration of the project.
- 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 weekly safety meetings and daily job briefing sessions for the duration of the project. Documentation to be provided to the RE/CPM on a monthly basis.
- Name the Project Safety Representative and Project Safety Manager, if required. The Contractor will be required to identify the Project Safety Representative and Project Safety Manager in the Site Safety Plan. Resumes, outlining the qualification and experience for the Project Safety Representative and Project Safety Manager, shall be available upon request. DDC reserves the right to request that the Contractor replace any Project Safety Representative or Project Safety Manager for any reason at any time during the project.
- Name a Competent Person(s), The Contractor will be required to identify a Competent Person(s) in the Site Safety Plan.
- Comply with all mandated federal, state and local safety and health rules and regulations.
- Comply with all provisions of the Site Safety Plan.
- Conduct applicable safety training prior to the commencement of work at the site. All training records (OSHA 10-hour, flagger, scaffold, fall protection, confined space entry, etc.) shall be provided to the RE/CPM prior to mobilization, included in the Site Safety Plan, kept current during the course of the project, and available for review. Prior to performing any work on DDC project all employees shall have successfully completed, within the previous five calendar years, a 10 Hour OSHA construction safety course.
- As part of the Site Safety Plan, prepare a site specific programs and plans, such as MPT plan, steel erection plan, confined space program, fall protection plan, demolition plan, etc. (if not otherwise provided in the contract documents) and comply with all of its provisions.
- Conduct and document site-specific safety orientation for Contractor 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 and/or Project Safety Manager will conduct this training prior to mobilization and provide documentation to the RE/CPM.
- 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.).
- Report unsafe or unhealthy conditions to the RE/CPM as soon as practical, but no more than 24 hours after discovery, and take prompt actions to remove or abate such conditions.
- Report any accidents involving injuries to workers or the general public, as well as property damage, to the RE/CPM within one (1) hour.
- Following an accident, the Contractor shall not remove or alter any equipment, structure, material, or evidence related to the accident. 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.
- Notify the RE/CPM within one (1) hour of the start of an inspection by any outside regulatory agency personnel, including OSHA, NYC DOB or others.
- Maintain all records pertaining to all required compliance documents and accident and injury reports.
- Address DDC recommendations on safety, which shall 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 must 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 must 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:

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- 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 safety program and site safety plan submittals; etc.)
- Criteria 6: OSHA violation history for the last three (3) years;
- Criteria 7: Contractor shall 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 Construction Safety Unit 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. SAFETY PROGRAM AND SITE SAFETY PLAN

Within thirty (30) days from the Award Date, or as otherwise directed, the Contractor shall submit the following: (1) Safety Program, and (2) Site Safety Plan. The Safety Program shall set forth the Contractor's overall safety policy, regulatory compliance plan and minimum safety standards. The Site Safety Plan shall 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 Safety Program and the Site Safety Plan are subject to review and acceptance by the Construction Safety Unit prior to the commencement of work at the site. Failure by the Contractor to submit an acceptable Site Safety Plan and Safety Program shall be grounds for default.

**Safety Program:** Corporate Safety Program established by the Contractor that includes the Contractor's overall safety policy, regulatory compliance plan and basic safety procedures covering all aspects of construction operations, performed by the Contractor. The Safety Program shall be a written document with a separate section describing each element of the Safety Program. The Safety Program shall have at minimum the following elements applicable to the Contractor's operations:

- Responsibility and Organization – Contractor's company organization chart, including titles, names, contact information, roles and responsibilities for key personnel, etc.
- Safety Training Program – Contractor's corporate training program.
- Hazard Corrective Actions – Criteria for safety inspections, identification of safety non-compliances, implementation and verification of corrective actions, forms to document safety inspections results, etc.
- Accident/Exposure Investigation
- Recordkeeping and Reporting Injuries – Responsible staff; reporting and recording criteria; OSHA 300 and 300A form completion, etc.
- Fire Protection and Prevention Program
- Housekeeping
- Illumination
- Sanitation
- Personal Protective Equipment (PPE) – Company policy for the use of head protection, foot protection, hearing protection, eye and face protection, protective clothing, and any additional protective equipment based on work tasks; PPE inspection and replacement policy.
- Hazard Communication Program
- Employee Emergency Action Plan
- Protection of Underground Facilities and Utilities
- Ionizing/Nonionizing Radiation
- Material Handling, Storage, Use and Disposal
- Tools – Hand and Power
- Signs, Signals, and Barricades

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- Scaffold – Local Law 52 requirements, installation, use, inspection, dismantling, training and general safety requirements.
- Welding and Cutting
- Electrical Safety
- Fall Protection
- Cranes, Derrick, Hoists, Elevators, Conveyors
- Excavation Safety
- Concrete and Masonry Construction
- Maintenance and Protection of Traffic
- Steel Erection
- Demolition
- Blasting and the Use of Explosives
- Stairways and Ladders
- Toxic and Hazardous Substances
- Alcohol and Drug Abuse Policy
- Rodents and Vermin
- Occupational Noise Exposure
- Confined Space Program – General confined Space Program: training requirements, confined space hazard evaluation procedure, atmospheric testing procedure, confined space classification, permit-required procedure, communication procedure, rescue procedure, forms, etc.
- Construction Vehicles/Heavy Equipment
- Dust Control Procedures

Site Safety Plan: The Site Safety Plan shall be a written document and shall apply to all project specific Contractor and subcontractor operations, and shall have at a minimum, the following elements with each element 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):

- Project Work Scope – Detailed information regarding work tasks that will be performed by contractor and subcontractors under the project.
- Responsibility and Organization – Contractor's organization chart with responsible staff for the project, including titles, names, contact information, roles and responsibilities.
- 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.
- Job Hazard Analysis (JHA) – Project specific Job Hazard Analysis including work tasks, identified hazards, hazard control methods (administrative, engineering, PPE), contractor's name, project id, location, name and signature of a certifying person, hazard assessment date.
- Protection of Public
- Hazard Corrective Actions – Responsible staff, forms, frequency of safety inspections and implementation of corrective actions.
- Accident/Exposure Investigation – Accident/incident notification procedure of DDC project staff. Project specific procedures for accident investigation and implementation of corrective actions.
- First Aid and Medical Attention – Responsible staff, location and inspection of First Aid kit, directions to local hospitals; emergency telephone numbers.
- Project Specific Fire Protection and Prevention Program.
- Project Specific Illumination Procedure.
- Project Specific Sanitation Procedure.
- Personal Protective Equipment (PPE)
- Hazard Communication Program – Responsible staff; training; SDS records, project specific list of chemical; location of the program and SDS records.
- 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.
- Employee Emergency Action Plan – Project specific: responsible staff, emergency alarm system, evacuation procedure, procedure to account for employees after evacuation, etc.
- Evacuation Plan – Project specific evacuation plan (drawing/scheme) with exists and evacuation routes.

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- Protection of Underground Facilities and Utilities, including responsible staff.
- Ionizing/Nonionizing Radiation – Competent person, license and qualification requirements, type of radiation, employees exposure and protection, etc.
- Material Handling, Storage, Use and Disposal – Project specific information regarding material storage and disposal.
- Signs, Signals, and Barricades – Use of danger/warning signs, sidewalk closure, safety instruction signs, pedestrian fencing and barricades, etc.
- Scaffold – Project specific scaffold types, training, scaffold drawings, competent person, criteria for project specific scaffold, falling object protection.
- 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, FDNY certificate requirements.
- Fall Protection – Project specific information regarding selected fall protection systems, fall protection plan.
- 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.
- Excavation Safety – Competent person, project specific protective system.
- Maintenance and Protection of Traffic Plan – Project specific MPT plan, flagmen training.
- Steel Erection – Site specific erection plan, requirements for applicable written notifications, competent person.
- 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.
- Blasting and the Use of Explosives – Project specific safety procedures, warning signs, training/qualification, transportation, storage and use of explosives, inspection.
- Toxic and Hazardous Substances – Safety procedures for substances to be used on project.
- Noise Mitigation Plan – Completed project specific Noise Mitigation Plan.
- Confined Space Program – Project specific Confined Space Program, responsible staff, training records, equipment information, rescue procedure, list of project specific confined spaces, forms.
- Construction Vehicles/Heavy Equipment – Type of construction vehicles/heavy equipment to be used on site.
- Dust Mitigation Plan – Completed project specific Dust Mitigation Plan.

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 must conduct a site and task assessment JHA to identify the major job steps 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 shall be communicated to all contractor/subcontractor personnel on site.

The initial Job Hazard Assessment form shall be included in the contractor's Site Safety Plan and the current form shall be available at the construction site for reference.

Certain DDC programs, such as Job Order Contracting System (JOCS), may not necessarily require Site Safety Plans. The JOCS contractor shall submit a Safety Program. The Site Safety Plan requirement for the JOCS contractor will be determined by QA&CS based on a project work scope, construction activities and project location. In addition, certain DDC Operating Units may establish client-specific program or safety requirements. The contractor's Site Safety Plan must address such client-specific program or safety requirements.

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

RE/CPM shall invite QA&CS Construction Safety Unit to the construction kick-off meeting. A QA&CS representative will participate in this meeting with the Contractor and RE/CPM prior to the start of the project for the purpose of:

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- A. Reviewing the safety issues detailed in the contract.
- B. Reviewing the Site Safety Plan.
- C. Reviewing any new issues or information that was not previously addressed.
- D. Discussing planned inspections and audits of the site by QA&CS 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 Construction Safety Unit or other designated DDC representative or Consultant during regular, unannounced inspections of the job site. Field Exit Conferences will be held with the RE/CPM, Contractor Project Safety Representatives.
- B. The RE/CPM will continually monitor the safety and environmental performance of the contractor's employees and work methods. Deficiencies shall be brought to the attention of the contractor's representative on site for immediate correction. The DDC representative will maintain a written record of these deficiencies and have these records available upon request. Any critical deficiencies shall be immediately reported to QA&CS phone# (718) 391-1624 or (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 – QA&CS, or his/her designee will meet with the Contractor's Project Safety Representative and or Project Safety Manager, the DDC Project Manager, the RE/CPM, 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 to occur with inadequate attention by the contractor, this shall, among other remedies available, be grounds for default.
- E. The contractor shall within 1 hour inform the RE/CPM/CM of all accidents/incidents 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/CPM shall notify the Construction Safety Unit as per DDC's Construction Safety Emergency and Accident Notification and Response Protocol and shall maintain a record of all contractor accidents/incidents for the project.
- F. The Construction Safety Unit shall be notified 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 shall be a reason to rate a Contractor unsatisfactory which may be reflected in the City's Vendex system and will be considered for future procurement actions as set forth in the City's Procurement Policy Board Rules.

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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 may be specifically excluded, shall be deemed to be part of this Contract:

1.1.1 All provisions required by law to be inserted in this Contract, whether actually inserted or not;

1.1.2 The Contract Drawings and Specifications;

1.1.3 The General Conditions and Special Conditions, if any;

1.1.4 The Contract;

1.1.5 The Information for Bidders; Request for Proposals; Notice of Solicitation and Proposal For Bids; Bid or Proposal, and, if used, the Bid Booklet;

1.1.6 All Addenda issued prior to the receipt of the bids; the Notice of Award; Performance and Payment Bonds, if required; and the Notice to Proceed or the Order to Work.

1.2 Should any conflict occur in or between the Drawings and Specifications, the Contractor shall be deemed to have estimated the most expensive way of doing the Work, unless the Contractor shall have asked for and obtained a decision in writing from the Commissioner of the Agency that is entering into this Contract, before the submission of its bid, as to what shall govern.

ARTICLE 2. DEFINITIONS

2.1 The following words and expressions, or pronouns used in their stead, shall, wherever they appear in this Contract, be construed as follows, unless a different meaning is clear from the context:

2.1.1 "Addendum" or "Addenda" shall mean the additional Contract provisions and/or technical clarifications issued in writing by the Commissioner prior to the receipt of bids.

2.1.2 "Agency" shall mean a city, county, borough or other office, position, department, division, bureau, board or commission, or a corporation, institution or agency of government, the expenses of which are paid in whole or in part from the City treasury.

2.1.3 "Agency Chief Contracting Officer" (ACCO) shall mean a person delegated authority by the Commissioner to organize and supervise the procurement activity of subordinate Agency staff in conjunction with the CCPO, or his/her duly authorized representative.

- 2.1.4 "Allowance" shall mean a sum of money which the Agency may include in the total amount of the Contract for such specific contingencies as the Agency believes may be necessary to complete the Work, e.g., lead or asbestos remediation, and for which the Contractor will be paid on the basis of stipulated unit prices or a formula set forth in the Contract or negotiated between the parties provided, however, that if the Contractor is not directed to use the Allowance, the Contractor shall have no right to such money and it shall be deducted from the total amount of the Contract.
- 2.1.5 "City" shall mean the City of New York.
- 2.1.6 "City Chief Procurement Officer" (CCPO) shall mean a person delegated authority by the Mayor to coordinate and oversee the procurement activity of Mayoral agency staff, including the ACCO and any offices which have oversight responsibility for the procurement of construction, or his/her duly authorized representative.
- 2.1.7 "Commissioner" shall mean the head of the Agency that has entered into this Contract, or his/her duly authorized representative.
- 2.1.8 "Comptroller" shall mean the Comptroller of the City of New York.
- 2.1.9 "Contract" or "Contract Documents" shall mean each of the various parts of the contract referred to in Article 1 hereof, both as a whole and severally.
- 2.1.10 "Contract Drawings" shall mean only those drawings specifically entitled as such and listed in the Specifications or in any Addendum, or any drawings furnished by the Commissioner, pertaining or supplemental thereto.
- 2.1.11 "Contract Work" shall mean everything required to be furnished and done by the Contractor by any one or more of the parts of the Contract referred to in Article 1, except Extra Work as hereinafter defined.
- 2.1.12 "Contractor" shall mean the entity which executed this Contract, whether a corporation, firm, partnership, joint venture, individual, or any combination thereof, and its, their, his/her successors, personal representatives, executors, administrators, and assigns, and any person, firm, partnership, joint venture, individual, or corporation which shall at any time be substituted in the place of the Contractor under this Contract.
- 2.1.13 "Days" shall mean calendar days, except where otherwise specified.
- 2.1.14 "Engineer" or "Architect" or "Project Manager" shall mean the person so designated in writing by the Commissioner in the Notice to Proceed or the Order to Work to act as such in relation to this Contract, including a private Architect or Engineer or Project Manager, as the case may be. Subject to written approval by the Commissioner, the Engineer, Architect or Project Manager may designate an authorized representative.
- 2.1.15 "Engineering Audit Officer" (EAO) shall mean the person so designated by the Commissioner to perform responsible auditing functions hereunder.
- 2.1.16 "Extra Work" shall mean Work other than that required by the Contract at the time of award which is authorized by the Commissioner pursuant to Chapter VI of this Contract.
- 2.1.17 "Federal-Aid Contract" shall mean a contract in which the United States (federal) Government provides financial funding as so designated in the Information for Bidders.

2.1.18 **"Final Acceptance"** shall mean final written acceptance of all the Work by the Commissioner, a copy of which shall be sent to the Contractor.

2.1.19 **"Final Approved Punch List"** shall mean a list, approved pursuant to Article 14.2.2, specifying those items of Work to be completed by the Contractor after Substantial Completion and dates for the completion of each item of Work.

2.1.20 **"Law"** or **"Laws"** shall mean the Constitution of the State of New York, the New York City Charter, the New York City Administrative Code, a statute of the United States or of the State of New York, a local law of the City of New York, any ordinance, rule or regulation having the force of law, or common law.

2.1.21 **"Materialman"** shall mean any corporation, firm, partnership, joint venture, or individual, other than employees of the Contractor, who or which contracts with the Contractor or any Subcontractor, to fabricate or deliver, or who actually fabricates or delivers, plant, materials or equipment to be incorporated in the Work.

2.1.22 **"Means and Methods of Construction"** shall mean the labor, materials, temporary structures, tools, plant, and construction equipment, and the manner and time of their use, necessary to accomplish the result intended by this Contract.

2.1.23 **"Notice to Proceed"** or **"Order to Work"** shall mean the written notice issued by the Commissioner specifying the time for commencement of the Work and the Engineer, Architect or Project Manager.

2.1.24 **"Other Contractor(s)"** shall mean any contractor (other than the entity which executed this Contract or its Subcontractors) who or which has a contract with the City for work on or adjacent to the building or Site of the Work.

2.1.25 **"Payroll Taxes"** shall mean State Unemployment Insurance (SUI), Federal Unemployment Insurance (FUI), and payments pursuant to the Federal Insurance Contributions Act (FICA).

2.1.26 **"Project"** shall mean the public improvement to which this Contract relates.

2.1.27 **"Procurement Policy Board"** (PPB) shall mean the Agency of the City of New York whose function is to establish comprehensive and consistent procurement policies and rules which shall have broad application throughout the City.

2.1.28 **"Required Quantity"** in a unit price Contract shall mean the actual quantity of any item of Work or materials which is required to be performed or furnished in order to comply with the Contract.

2.1.29 **"Resident Engineer"** shall mean the representative of the Commissioner duly designated by the Commissioner to be his/her representative at the site of the Work.

2.1.30 **"Site"** shall mean the area upon or in which the Contractor's operations are carried on, and such other areas adjacent thereto as may be designated as such by the Engineer.

2.1.31 **"Small Tools"** shall mean items that are ordinarily required for a worker's job function, including but not limited to, equipment that ordinarily has no licensing, insurance



or substantive storage costs associated with it; such as circular and chain saws, impact drills, threaders, benders, wrenches, socket tools, etc.

2.1.32 "Specifications" shall mean all of the directions, requirements, and standards of performance applying to the Work as hereinafter detailed and designated under the Specifications.

2.1.33 "Subcontractor" shall mean any person, firm or corporation, other than employees of the Contractor, who or which contracts with the Contractor or with its subcontractors to furnish, or actually furnishes labor, or labor and materials, or labor and equipment, or superintendence, supervision and/or management at the Site. Wherever the word Subcontractor appears, it shall also mean sub-Subcontractor.

2.1.34 "Substantial Completion" shall mean the written determination by the Engineer that the Work required under this Contract is substantially, but not entirely, complete and the approval of the Final Approved Punch List.

2.1.35 "Work" shall mean all services required to complete the Project in accordance with the Contract Documents, including without limitation, labor, material, superintendence, management, administration, equipment, and incidentals, and obtaining any and all permits, certifications and licenses as may be necessary and required to complete the Work, and shall include both Contract Work and Extra Work.

## CHAPTER II THE WORK AND ITS PERFORMANCE

### ARTICLE 3. CHARACTER OF THE WORK

3.1 Unless otherwise expressly provided in the Contract Drawings, Specifications, and Addenda, the Work shall be performed in accordance with the best modern practice, utilizing, unless otherwise specified in writing, new and unused materials of standard first grade quality and workmanship and design of the highest quality, to the satisfaction of the Commissioner.

### ARTICLE 4. MEANS AND METHODS OF CONSTRUCTION

4.1 Unless otherwise expressly provided in the Contract Drawings, Specifications, and Addenda, the Means and Methods of Construction shall be such as the Contractor may choose; subject, however, to the Engineer's right to reject the Means and Methods of Construction proposed by the Contractor which in the opinion of the Engineer:

4.1.1 Will constitute or create a hazard to the Work, or to persons or property; or

4.1.2 Will not produce finished Work in accordance with the terms of the Contract; or

4.1.3 Will be detrimental to the overall progress of the Project.

4.2 The Engineer's approval of the Contractor's Means and Methods of Construction, or his/her failure to exercise his/her right to reject such means or methods, shall not relieve the Contractor of its obligation to complete the Work as provided in this Contract; nor shall the exercise of such right to reject create a cause of action for damages.

## ARTICLE 5. COMPLIANCE WITH LAWS

5.1 The Contractor shall comply with all Laws applicable to this Contract and to the Work to be done hereunder.

5.2 Procurement Policy Board Rules: This Contract is subject to the Rules of the PPB ("PPB Rules") in effect at the time of the bid opening for this Contract. In the event of a conflict between the PPB Rules and a provision of this Contract, the PPB Rules shall take precedence.

5.3 Noise Control Code provisions.

5.3.1 In accordance with the provisions of Section 24-216(b) of the Administrative Code of the City ("Administrative Code"), Noise Abatement Contract Compliance, devices and activities which will be operated, conducted, constructed or manufactured pursuant to this Contract and which are subject to the provisions of the City Noise Control Code shall be operated, conducted, constructed, or manufactured without causing a violation of the Administrative Code. Such devices and activities shall incorporate advances in the art of noise control development for the kind and level of noise emitted or produced by such devices and activities, in accordance with regulations issued by the Commissioner of the City Department of Environmental Protection.

5.3.2 The Contractor agrees to comply with Section 24-219 of the Administrative Code and implementing rules codified at 15 Rules of the City of New York ("RCNY") Section 28-100 *et seq.* In accordance with such provisions, the Contractor, if the Contractor is the responsible party under such regulations, shall prepare and post a Construction Noise Mitigation Plan at each Site, in which the Contractor shall certify that all construction tools and equipment have been maintained so that they operate at normal manufacturers operating specifications. If the Contractor cannot make this certification, it must have in place an Alternative Noise Mitigation Plan approved by the City Department of Environmental Protection. In addition, the Contractor's certified Construction Noise Mitigation Plan is subject inspection by the City Department of Environmental Protection in accordance with Section 28-101 of Title 15 of RCNY. No Contract Work may take place at a Site unless there is a Construction Noise Mitigation Plan or approved Alternative Noise Mitigation Plan in place. In addition, the Contractor shall create and implement a noise mitigation training program. Failure to comply with these requirements may result in fines and other penalties pursuant to the applicable provisions of the Administrative Code and RCNY.

5.4 Ultra Low Sulfur Diesel Fuel: In accordance with the provisions of Section 24-163.3 of the Administrative Code, the Contractor specifically agrees as follows:

5.4.1 Definitions. For purposes of this Article 5.4, the following definitions apply:

5.4.1(a) "Contractor" means any person or entity that enters into a Public Works Contract with a City Agency, or any person or entity that enters into an agreement with such person or entity, to perform work or provide labor or services related to such Public Works Contract.

5.4.1(b) "Motor Vehicle" means any self-propelled vehicle designed for transporting persons or property on a street or highway.

5.4.1(c) "Nonroad Engine" means an internal combustion engine (including the fuel system) that is not used in a Motor Vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under Section 7411 or Section 7521 of

Title 42 of the United States Code, except that this term shall apply to internal combustion engines used to power generators, compressors or similar equipment used in any construction program or project.

5.4.1(d) "Nonroad Vehicle" means a vehicle that is powered by a Nonroad Engine, fifty (50) horsepower and greater, and that is not a Motor Vehicle or a vehicle used solely for competition, which shall include, but not be limited to, excavators, backhoes, cranes, compressors, generators, bulldozers, and similar equipment, except that this term shall not apply to horticultural maintenance vehicles used for landscaping purposes that are powered by a Nonroad Engine of sixty-five (65) horsepower or less and that are not used in any construction program or project.

5.4.1(e) "Public Works Contract" means a contract with a City Agency for a construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge; a contract with a City Agency for the preparation for any construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge; or a contract with a City Agency for any final work involved in the completion of any construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge.

5.4.1(f) "Ultra Low Sulfur Diesel Fuel" means diesel fuel that has a sulfur content of no more than fifteen parts per million (15 ppm).

#### 5.4.2 Ultra Low Sulfur Diesel Fuel

5.4.2(a) All Contractors shall use Ultra Low Sulfur Diesel Fuel in diesel-powered Nonroad Vehicles in the performance of this Contract.

5.4.2(b) Notwithstanding the requirements of Article 5.4.2(a), Contractors may use diesel fuel that has a sulfur content of no more than thirty parts per million (30 ppm) to fulfill the requirements of this Article 5.4.2, where the Commissioner of the City Department of Environmental Protection ("DEP Commissioner") has issued a determination that a sufficient quantity of Ultra Low Sulfur Diesel Fuel is not available to meet the needs of Agencies and Contractors. Any such determination shall expire after six (6) months unless renewed.

5.4.2(c) Contractors shall not be required to comply with this Article 5.4.2 where the City Agency letting this Contract makes a written finding, which is approved, in writing, by the DEP Commissioner, that a sufficient quantity of Ultra Low Sulfur Diesel Fuel, or diesel fuel that has a sulfur content of no more than thirty parts per million (30 ppm) is not available to meet the requirements of Section 24-163.3 of the Administrative Code, provided that such Contractor in its fulfillment of the requirements of this Contract, to the extent practicable, shall use whatever quantity of Ultra Low Sulfur Diesel Fuel or diesel fuel that has a sulfur content of no more than thirty parts per million (30 ppm) is available. Any finding made pursuant to this Article 5.4.2(c) shall expire after sixty (60) Days, at which time the requirements of this Article 5.4.2 shall be in full force and effect unless the City Agency renews the finding in writing and such renewal is approved by the DEP Commissioner.

5.4.2(d) **Contractors** may check on determinations and approvals issued by the DEP Commissioner pursuant to Section 24-163.3 of the Administrative Code, if any, at [www.dep.nyc.gov](http://www.dep.nyc.gov) or by contacting the **City Agency** letting this **Contract**.

5.4.2(e) The requirements of this Article 5.4.2 do not apply where they are precluded by federal or State funding requirements or where the **Contract** is an emergency procurement.

#### 5.4.3 Best Available Technology

5.4.3(a) All **Contractors** shall utilize the best available technology for reducing the emission of pollutants for diesel-powered Nonroad Vehicles in the performance of this **Contract**. For determinations of best available technology for each type of diesel-powered Nonroad Vehicle, **Contractors** shall comply with the regulations of the City Department of Environmental Protection, as and when adopted, Chapter 14 of Title 15 of the Rules of the City of New York (RCNY). The **Contractor** shall fully document all steps in the best available technology selection process and shall furnish such documentation to the **City Agency** or the DEP Commissioner upon request. The **Contractor** shall retain all documentation generated in the best available technology selection process for as long as the selected best available technology is in use.

5.4.3(b) No **Contractor** shall be required to replace best available technology for reducing the emission of pollutants or other authorized technology utilized for a diesel-powered Nonroad Vehicle in accordance with the provisions of this Article 5.4.3 within three (3) years of having first utilized such technology for such vehicle.

5.4.3(c) This Article 5.4.3 shall not apply to any vehicle used to satisfy the requirements of a specific Public Works Contract for fewer than twenty (20) Days.

5.4.3(d) The **Contractor** shall not be required to comply with this Article 5.4.3 with respect to a diesel-powered Nonroad Vehicle under the following circumstances:

5.4.3(d)(i) Where the **City Agency** makes a written finding, which is approved, in writing, by the DEP Commissioner, that the best available technology for reducing the emission of pollutants as required by this Article 5.4.3 is unavailable for such vehicle, the **Contractor** shall use whatever technology for reducing the emission of pollutants, if any, is available and appropriate for such vehicle.

5.4.3(d)(ii) Where the DEP Commissioner has issued a written waiver based upon the **Contractor** having demonstrated to the DEP Commissioner that the use of the best available technology for reducing the emission of pollutants might endanger the operator of such vehicle or those working near such vehicle, due to engine malfunction, the **Contractor** shall use whatever technology for reducing the emission of pollutants, if any, is available and appropriate for such vehicle, which would not endanger the operator of such vehicle or those working near such vehicle.

5.4.3(d)(iii) In determining which technology to use for the purposes of Articles 5.4.3(d)(i) and 5.4.3(d)(ii) above, the **Contractor** shall primarily consider the reduction in emissions of particulate matter and secondarily consider the reduction in emissions of nitrogen oxides associated with the use of such

technology, which shall in no event result in an increase in the emissions of either such pollutant.

5.4.3(d)(iv) The Contractor shall submit requests for a finding or a waiver pursuant to this Article 5.4.3(d) in writing to the DEP Commissioner, with a copy to the ACCO of the City Agency letting this Contract. Any finding or waiver made or issued pursuant to Articles 5.4.3(d)(i) and 5.4.3(d)(ii) above shall expire after one hundred eighty (180) Days, at which time the requirements of Article 5.4.3(a) shall be in full force and effect unless the City Agency renews the finding, in writing, and the DEP Commissioner approves such finding, in writing, or the DEP Commissioner renews the waiver, in writing.

5.4.3(e) The requirements of this Article 5.4.3 do not apply where they are precluded by federal or State funding requirements or where the Contract is an emergency procurement.

5.4.4 Section 24-163 of the Administrative Code. The Contractor shall comply with Section 24-163 of the Administrative Code related to the idling of the engines of motor vehicles while parking.

#### 5.4.5 Compliance

5.4.5(a) The Contractor's compliance with Article 5.4 may be independently monitored. If it is determined that the Contractor has failed to comply with any provision of Article 5.4, any costs associated with any independent monitoring incurred by the City shall be reimbursed by the Contractor.

5.4.5(b) Any Contractor who violates any provision of Article 5.4, except as provided in Article 5.4.5(c) below, shall be liable for a civil penalty between the amounts of one thousand (\$1,000) and ten thousand (\$10,000) dollars, in addition to twice the amount of money saved by such Contractor for failure to comply with Article 5.4.

5.4.5(c) No Contractor shall make a false claim with respect to the provisions of Article 5.4 to a City Agency. Where a Contractor has been found to have done so, such Contractor shall be liable for a civil penalty of twenty thousand (\$20,000) dollars, in addition to twice the amount of money saved by such Contractor in association with having made such false claim.

#### 5.4.6 Reporting

5.4.6(a) For all Public Works Contracts covered by this Article 5.4, the Contractor shall report to the City Agency the following information:

5.4.6(a)(i) The total number of diesel-powered Nonroad Vehicles used to fulfill the requirements of this Public Works Contract;

5.4.6(a)(ii) The number of such Nonroad Vehicles that were powered by Ultra Low Sulfur Diesel Fuel;

5.4.6(a)(iii) The number of such Nonroad Vehicles that utilized the best available technology for reducing the emission of pollutants, including a breakdown by vehicle model and the type of technology;

5.4.6(a)(iv) The number of such Nonroad Vehicles that utilized such other authorized technology in accordance with Article 5.4.3, including a breakdown by vehicle model and the type of technology used for each such vehicle;

5.4.6(a)(v) The locations where such Nonroad Vehicles were used; and

5.4.6(a)(vi) Where a determination is in effect pursuant to Article 5.4.2(b) or 5.4.2(c), detailed information concerning the Contractor's efforts to obtain Ultra Low Sulfur Diesel Fuel or diesel fuel that has a sulfur content of no more than thirty parts per million (30 ppm).

5.4.6(b) The Contractor shall submit the information required by Article 5.4.6(a) at the completion of Work under the Public Works Contract and on a yearly basis no later than August 1 throughout the term of the Public Works Contract. The yearly report shall cover Work performed during the preceding fiscal year (July 1 - June 30).

5.5 Ultra Low Sulfur Diesel Fuel. In accordance with the Coordinated Construction Act for Lower Manhattan, as amended:

5.5.1 Definitions. For purposes of this Article 5.5, the following definitions apply:

5.5.1(a) "Lower Manhattan" means the area to the south of and within the following lines: a line beginning at a point where the United States pierhead line in the Hudson River as it exists now or may be extended would intersect with the southerly line of West Houston Street in the Borough of Manhattan extended, thence easterly along the southerly side of West Houston Street to the southerly side of Houston Street, thence easterly along the southerly side of Houston Street to the southerly side of East Houston Street, thence northeasterly along the southerly side of East Houston Street to the point where it would intersect with the United States pierhead line in the East River as it exists now or may be extended, including tax lots within or immediately adjacent thereto.

5.5.1(b) "Lower Manhattan Redevelopment Project" means any project in Lower Manhattan that is funded in whole or in part with federal or State funding, or any project intended to improve transportation between Lower Manhattan and the two air terminals in the City known as LaGuardia Airport and John F. Kennedy International Airport, or between Lower Manhattan and the air terminal in Newark known as Newark Liberty International Airport, and that is funded in whole or in part with federal funding.

5.5.1(c) "Nonroad Engine" means an internal combustion engine (including the fuel system) that is not used in a Motor Vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under Section 7411 or Section 7521 of Title 42 of the United States Code, except that this term shall apply to internal combustion engines used to power generators, compressors or similar equipment used in any construction program or project.

5.5.1(d) "Nonroad Vehicle" means a vehicle that is powered by a Nonroad Engine, fifty (50) horsepower (HP) and greater, and that is not a Motor Vehicle or a vehicle used solely for competition, which shall include, but not be limited to, excavators, backhoes, cranes, compressors, generators, bulldozers, and similar equipment, except

that this terms shall not apply to horticultural maintenance vehicles used for landscaping purposes that are powered by a Nonroad Engine of sixty-five (65) HP or less and that are not used in any construction program or project.

5.5.1(e) "Ultra Low Sulfur Diesel Fuel" means diesel fuel that has a sulfur content of no more than fifteen parts per million (15 ppm).

5.5.2 Requirements. **Contractors** and **Subcontractors** are required to use only Ultra Low Sulfur Diesel Fuel to power the diesel-powered Nonroad Vehicles with engine HP rating of fifty (50) HP and above used on a Lower Manhattan Redevelopment Project and, where practicable, to reduce the emission of pollutants by retrofitting such Nonroad Vehicles with oxidation catalysts, particulate filters, or technology that achieves lowest particulate matter emissions.

5.6 Pesticides. In accordance with Section 17-1209 of the Administrative Code, to the extent that the **Contractor** or any **Subcontractor** applies pesticides to any property owned or leased by the **City**, the **Contractor**, and any **Subcontractor** shall comply with Chapter 12 of the Administrative Code.

5.7 Waste Treatment, Storage, and Disposal Facilities and Transporters. In connection with the **Work**, the **Contractor** and any **Subcontractor** shall use only those waste treatment, storage, and disposal facilities and waste transporters that possess the requisite license, permit or other governmental approval necessary to treat, store, dispose, or transport the waste, materials or hazardous substances.

5.8 Environmentally Preferable Purchasing. The **Contractor** shall ensure that products purchased or leased by the **Contractor** or any **Subcontractor** for the **Work** that are not specified by the **City** or are submitted as equivalents to a product specified by the **City** comply with the requirements of the New York City Environmentally Preferable Purchasing Program contained in Chapter 11 of Title 43 of the RCNY, pursuant to Chapter 3 of Title 6 of the Administrative Code.

## ARTICLE 6. INSPECTION

6.1 During the progress of the **Work** and up to the date of **Final Acceptance**, the **Contractor** shall at all times afford the representatives of the **City** every reasonable, safe, and proper facility for inspecting all **Work** done or being done at the **Site** and also for inspecting the manufacture or preparation of materials and equipment at the place of such manufacture or preparation.

6.2 The **Contractor's** obligation hereunder shall include the uncovering or taking down of finished **Work** and its restoration thereafter; provided, however, that the order to uncover, take down and restore shall be in writing, and further provided that if **Work** thus exposed proves satisfactory, and if the **Contractor** has complied with Article 6.1, such uncovering or taking down and restoration shall be considered an item of **Extra Work** to be paid for in accordance with the provisions of Article 26. If the **Work** thus exposed proves unsatisfactory, the **City** has no obligation to compensate the **Contractor** for the uncovering, taking down or restoration.

6.3 Inspection and approval by the **Commissioner**, the **Engineer**, **Project Manager**, or **Resident Engineer**, of finished **Work** or of **Work** being performed, or of materials and equipment at the place of manufacture or preparation, shall not relieve the **Contractor** of its obligation to perform the **Work** in strict accordance with the **Contract**. Finished or unfinished **Work** not found to be in strict accordance with the **Contract** shall be replaced as directed by the **Engineer**, even though such **Work** may have been previously approved and paid for. Such corrective **Work** is **Contract Work** and shall not be deemed **Extra Work**.

6.4 Rejected Work and materials shall be promptly taken down and removed from the Site, which must at all times be kept in a reasonably clean and neat condition.

**ARTICLE 7. PROTECTION OF WORK AND OF PERSONS  
AND PROPERTY; NOTICES AND INDEMNIFICATION**

7.1 During the performance of the Work and up to the date of Final Acceptance, the Contractor shall be under an absolute obligation to protect the finished and unfinished Work against any damage, loss, injury, theft and/or vandalism and in the event of such damage, loss, injury, theft and/or vandalism, it shall promptly replace and/or repair such Work at the Contractor's sole cost and expense, as directed by the Resident Engineer. The obligation to deliver finished Work in strict accordance with the Contract prior to Final Acceptance shall be absolute and shall not be affected by the Resident Engineer's approval of, or failure to prohibit, the Means and Methods of Construction used by the Contractor.

7.2 During the performance of the Work and up to the date of Final Acceptance, the Contractor shall take all reasonable precautions to protect all persons and the property of the City and of others from damage, loss or injury resulting from the Contractor's, and/or its Subcontractors' operations under this Contract. The Contractor's obligation to protect shall include the duty to provide, place or replace, and adequately maintain at or about the Site suitable and sufficient protection such as lights, barricades, and enclosures.

7.3 The Contractor shall comply with the notification requirements set forth below in the event of any loss, damage or injury to Work, persons or property, or any accidents arising out of the operations of the Contractor and/or its Subcontractors under this Contract.

7.3.1 The Contractor shall make a full and complete report in writing to the Resident Engineer within three (3) Days after the occurrence.

7.3.2 The Contractor shall also send written notice of any such event to all insurance carriers that issued potentially responsive policies (including commercial general liability insurance carriers for events relating to the Contractor's own employees) no later than twenty (20) days after such event and again no later than twenty (20) days after the initiation of any claim and/or action resulting therefrom. Such notice shall contain the following information: the number of the insurance policy, the name of the Named Insured, the date and location of the incident, and the identity of the persons injured or property damaged. For any policy on which the City and/or the Engineer, Architect, or Project Manager are Additional Insureds, such notice shall expressly specify that "this notice is being given on behalf of the City of New York as Additional Insured, such other Additional Insureds, as well as the Named Insured."

7.3.2(a) Whenever such notice is sent under a policy on which the City is an Additional Insured, the Contractor shall provide copies of the notice to the Comptroller, the Commissioner and the City Corporation Counsel. The copy to the Comptroller shall be sent to the Insurance Unit, NYC Comptroller's Office, 1 Centre Street – Room 1222, New York, New York, 10007. The copy to the Commissioner shall be sent to the address set forth in Schedule A of the General Conditions. The copy to the City Corporation Counsel shall be sent to Insurance Claims Specialist, Affirmative Litigation Division, New York City Law Department, 100 Church Street, New York, New York 10007.



7.3.2(b) If the Contractor fails to provide any of the foregoing notices to any appropriate insurance carrier(s) in a timely and complete manner, the Contractor shall indemnify the City for all losses, judgments, settlements, and expenses, including reasonable attorneys' fees, arising from an insurer's disclaimer of coverage citing late notice by or on behalf of the City.

7.4 To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold the City, its employees, and officials (the "Indemnitees") harmless against any and all claims (including but not limited to claims asserted by any employee of the Contractor and/or its Subcontractors) and costs and expenses of whatever kind (including but not limited to payment or reimbursement of attorneys' fees and disbursements) allegedly arising out of or in any way related to the operations of the Contractor and/or its Subcontractors in the performance of this Contract or from the Contractor's and/or its Subcontractors' failure to comply with any of the provisions of this Contract or of the Law. Such costs and expenses shall include all those incurred in defending the underlying claim and those incurred in connection with the enforcement of this Article 7.4 by way of cross-claim, third-party claim, declaratory action or otherwise. The parties expressly agree that the indemnification obligation hereunder contemplates (1) full indemnity in the event of liability imposed against the Indemnitees without negligence and solely by reason of statute, operation of Law or otherwise; and (2) partial indemnity in the event of any actual negligence on the part of the Indemnitees either causing or contributing to the underlying claim (in which case, indemnification will be limited to any liability imposed over and above that percentage attributable to actual fault whether by statute, by operation of Law, or otherwise). Where partial indemnity is provided hereunder, all costs and expenses shall be indemnified on a pro rata basis.

7.4.1 Indemnification under Article 7.4 or any other provision of the Contract shall operate whether or not Contractor or its Subcontractors have placed and maintained the insurance specified under Article 22.

7.5 The provisions of this Article 7 shall not be deemed to create any new right of action in favor of third parties against the Contractor or the City.

### CHAPTER III TIME PROVISIONS

#### ARTICLE 8. COMMENCEMENT AND PROSECUTION OF THE WORK

8.1 The Contractor shall commence the Work on the date specified in the Notice to Proceed or the Order to Work. The time for performance of the Work under the Contract shall be computed from the date specified in the Notice to Proceed or the Order to Work. **TIME BEING OF THE ESSENCE** to the City, the Contractor shall thereafter prosecute the Work diligently, using such Means and Methods of Construction as are in accord with Article 4 herein and as will assure its completion not later than the date specified in this Contract, or on the date to which the time for completion may be extended.

#### ARTICLE 9. PROGRESS SCHEDULES

9.1 To enable the Work to be performed in an orderly and expeditious manner, the Contractor, within fifteen (15) Days after the Notice to Proceed or Order to Work, unless otherwise directed by the Engineer, shall submit to the Engineer a proposed progress schedule based on the Critical Path Method in the form of a bar graph or in such other form as specified by the Engineer, and monthly cash flow requirements, showing:

9.1.1 The anticipated time of commencement and completion of each of the various operations to be performed under this Contract; and

9.1.2 The sequence and interrelation of each of these operations with the others and with those of other related contracts; and

9.1.3 The estimated time required for fabrication or delivery, or both, of all materials and equipment required for the Work, including the anticipated time for obtaining required approvals pursuant to Article 10; and

9.1.4 The estimated amount in dollars the Contractor will claim on a monthly basis.

9.2 The proposed schedule shall be revised as directed by the Engineer, until finally approved by the Engineer, and after such approval, subject to the provisions of Article 11, shall be strictly adhered to by the Contractor.

9.3 If the Contractor shall fail to adhere to the approved progress schedule, or to the schedule as revised pursuant to Article 11, it shall promptly adopt such other or additional Means and Methods of Construction, at its sole cost and expense, as will make up for the time lost and will assure completion in accordance with the approved progress schedule. The approval by the City of a progress schedule which is shorter than the time allotted under the Contract shall not create any liability for the City if the approved progress schedule is not met.

9.4 The Contractor will not receive any payments until the proposed progress schedule is submitted.

#### **ARTICLE 10. REQUESTS FOR INFORMATION OR APPROVAL**

10.1 From time to time as the Work progresses and in the sequence indicated by the approved progress schedule, the Contractor shall submit to the Engineer a specific request in writing for each item of information or approval required by the Contractor. These requests shall state the latest date upon which the information or approval is actually required by the Contractor, and shall be submitted in a reasonable time in advance thereof to provide the Engineer a sufficient time to act upon such submissions, or any necessary re-submissions thereof.

10.2 The Contractor shall not have any right to an extension of time on account of delays due to the Contractor's failure to submit requests for the required information or the required approval in accordance with the above requirements.

#### **ARTICLE 11. NOTICE OF CONDITIONS CAUSING DELAY AND DOCUMENTATION OF DAMAGES CAUSED BY DELAY**

11.1 After the commencement of any condition which is causing or may cause a delay in completion of the Work, including conditions for which the Contractor may be entitled to an extension of time, the following notifications and submittals are required:

11.1.1 Within seven (7) Days after the commencement of such condition, the Contractor must notify the Engineer 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.

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, and every thirty (30) **Days** thereafter for as long as such damages are being incurred, the **Contractor** shall submit to the **Commissioner** verified written statements of the details and the amounts of such damages, together with documentary evidence of such damages, ("statement of delay damages") as further detailed in Article 11.6. 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. On failure of the **Contractor** to strictly comply with all of 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 arising under or by reason of this **Contract** shall not be different from or in excess of the statements made and documentation provided pursuant to this Article 11.

11.1.3 Within 60 days of submission of the final verified statement of claims pursuant to Article 44, the **Commissioner** shall make a determination as to whether a compensable delay has occurred and, if so, the amount of compensation due the **Contractor**. Notwithstanding the above, the **Commissioner** may make a determination as to whether a compensable delay has occurred at any time after the **Contractor's** first submission of a statement of delay damages provided, however, that the amount of compensation due to the **Contractor** will not be determined until the **Commissioner** determines that the **Work** is delayed after the date set for substantial completion.

11.2 Failure of the **Contractor** to strictly comply with the requirements of Article 11.1.1 may, in the discretion of the **Commissioner**, be deemed sufficient cause to deny any extension of time on account of delay arising out of such condition. Failure of the **Contractor** to strictly comply with the requirements of Articles 11.1.1 and 11.1.2 shall be deemed a conclusive waiver by the **Contractor** of any and all claims for damages for delay arising from such condition and no right to recover on such claims shall exist.

11.3 When appropriate and directed by the **Engineer**, the progress schedule shall be revised by the **Contractor** until finally approved by the **Engineer**. The revised progress schedule must be strictly adhered to by the **Contractor**.

#### 11.4 Compensable Delays

11.4.1 The **Contractor** agrees to make claim only for additional costs attributable to delay in the performance of this **Contract** necessarily extending the time for completion of the **Work** or resulting from acceleration directed by the **Commissioner** and required to maintain the **Project** 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**, 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 Extended delays attributable to the **City** in the review or issuance of change orders, in shop drawing reviews and approvals or as a result of the cumulative impact of multiple change orders, which have a verifiable impact on **Project** costs.

11.4.1.3 The unavailability of the **Site** for an extended period of time that significantly affects the scheduled completion of the **Contract**.

11.4.1.4 The issuance by the **Engineer** of a stop work order relative to a substantial portion of the **Work** for a period exceeding thirty (30) **Days**, that was not brought about through any action or omission of the **Contractor**;

11.4.1.5 Differing site conditions that were neither known nor reasonably ascertainable on a pre-bid inspection of the **Site** or review of the bid documents or other publicly available sources, and that are not ordinarily encountered in the **Project's** geographical area or neighborhood or in the type of **Work** to be performed.

11.4.1.6 Delays caused by the **City's** bad faith or its willful, malicious, or grossly negligent conduct;

11.4.1.7 Delays not contemplated by the parties;

11.4.1.8 Delays so unreasonable that they constitute an intentional abandonment of the **Contract** by the **City**; and

11.4.1.9 Delays resulting from the **City's** breach of a fundamental obligation of the **Contract**.

11.4.2 No claim may be made for any alleged delay in **Substantial Completion** of the **Work** by a date earlier than the date of **Substantial Completion** provided for in Schedule A unless there is a provision in the **Contract** providing for additional compensation for early completion. No claim may be made for any alleged delay in **Substantial Completion** of the **Work** if the work 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.

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 generally recognized 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 action 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 amount of additional compensation sought and a breakdown of that amount into categories as described in Article 26.2, subject to the limitations set forth 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 Insurance and bond costs;

11.7.1.5 Extended field office costs;

11.7.1.6 Extended **Site** overhead; and

11.7.1.7 Extended home office overhead.

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 11.7.1.6, and an

additional overhead of five (5%) percent 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;

11.7.3.2 Consequential damages, including but not limited to interest on monies in dispute, including interest which is paid on such monies, 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;

11.7.3.4 Direct or indirect costs attributable to performance of Work where the Contractor, because of situations or conditions within its control, has not progressed the Work in a satisfactory manner; and

11.7.3.5 Attorneys' fees and dispute and claims preparation expenses.

11.8 Determinations 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 If the parties agree, pursuant to Article 11.1.3 above, that a compensable delay has occurred and agree on the amount of compensation, payment may be made pursuant to a written change order. Payment pursuant to such change order is subject to pre-audit by the Engineering Audit Officer, and may be post-audited by the Comptroller and/or the Agency.

## 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 the Engineer to issue any 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 Contractor under the provision similar to the following provisions which apply to this Contract and have been or will be inserted in the contracts with such Other Contractors:

12.5.1 Should any Other Contractor having or who shall hereafter have a contract with the City for the performance of work upon the Site sustain any damage through any act or omission of the Contractor hereunder or through any act or omission of any Subcontractor of the Contractor, the Contractor agrees to reimburse such Other Contractor for all such damages and to defend at its own expense any action based upon such claim and if any judgment or claim (even if the allegations of the action are without merit) against the City shall be allowed the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith and agrees to indemnify and hold the City harmless from all such claims. Insofar as the facts and Law relating to any claim would preclude the City from being completely indemnified by the Contractor, the City shall be partially indemnified by the Contractor to the fullest extent provided by Law.

12.6 The City's right to indemnification hereunder shall in no way be diminished, waived or discharged by its recourse to assessment of liquidated damages as provided in Article 15, or by the exercise of any other remedy provided for by Contract or by Law.

### ARTICLE 13. EXTENSION OF TIME FOR PERFORMANCE

13.1 If performance by the Contractor is delayed for a reason set forth in Article 13.3, the Contractor may be allowed a reasonable extension of time in conformance with this Article 13 and the PPB Rules.

13.2 Any extension of time may be granted only by the ACCO or by the Board for the Extension of Time (hereafter "Board") (as set forth below) upon written application by the Contractor.

13.3 Grounds for Extension: If such application is made, the Contractor shall be entitled to an extension of time for delay in completion of the Work caused solely:

13.3.1 By the acts or omissions of the City, its officials, agents or employees; or

13.3.2 By the act or omissions of **Other Contractors** on this **Project**; or

13.3.3 By supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, acts of God or the public enemy, excessive inclement weather, war or other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes not brought about by any act or omission of the **Contractor**).

13.3.4 The **Contractor** shall, however, be entitled to an extension of time for such causes only for the number of **Days** of delay which the **ACCO** or the Board may determine to be due solely to such causes, and then only if the **Contractor** shall have strictly complied with all of the requirements of Articles 9 and 10.

13.4 The **Contractor** shall not be entitled to receive a separate extension of time for each of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the **Work** as determined by the **ACCO** or the Board, irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the **Contractor** or of its **Subcontractors** or **Materialmen**, and would of itself (irrespective of the concurrent causes) have delayed the **Work**, no extension of time will be allowed for the period of delay resulting from such act, fault or omission.

13.5 The determination made by the **ACCO** or the Board on an application for an extension of time shall be binding and conclusive on the **Contractor**.

13.6 The **ACCO** or the Board acting entirely within their discretion may grant an application for an extension of time for causes of delay other than those herein referred.

13.7 Permitting the **Contractor** to continue with the **Work** after the time fixed for its completion has expired, or after the time to which such completion may have been extended has expired, or the making of any payment to the **Contractor** after such time, shall in no way operate as a waiver on the part of the **City** of any of its rights under this **Contract**.

#### 13.8 Application for Extension of Time:

13.8.1 Before the **Contractor's** time extension request will be considered, the **Contractor** shall notify the **ACCO** of the condition which allegedly has caused or is causing the delay, and shall submit a written application to the **ACCO** identifying:

13.8.1(a) The **Contractor**; the registration number; and **Project** description;

13.8.1(b) Liquidated damage assessment rate, as specified in the **Contract**;

13.8.1(c) Original total bid price;

13.8.1(d) The original **Contract** start date and completion date;

13.8.1(e) Any previous time extensions granted (number and duration); and

13.8.1(f) The extension of time requested.

13.8.2 In addition, the application for extension of time shall set forth in detail:

13.8.2(a) The nature of each alleged cause of delay in completing the **Work**;



13.8.2(b) The date upon which each such cause of delay began and ended and the number of Days attributable to each such cause;

13.8.2(c) A statement that the Contractor waives all claims except for those delineated in the application, and the particulars of any claims which the Contractor does not agree to waive. For time extensions for Substantial Completion and final completion payments, the application shall include a detailed statement of the dollar amounts of each element of claim item reserved; and

13.8.2(d) A statement indicating the Contractor's understanding that the time extension is granted only for purposes of permitting continuation of Contract performance and payment for Work performed and that the City retains its right to conduct an investigation and assess liquidated damages as appropriate in the future.

### 13.9 Analysis and Approval of Time Extensions:

13.9.1 For time extensions for partial payments, a written determination shall be made by the ACCO who may, for good and sufficient cause, extend the time for the performance of the Contract as follows:

13.9.1(a) If the Work is to be completed within six (6) months, the time for performance may be extended for sixty (60) Days;

13.9.1(b) If the Work is to be completed within less than one (1) year but more than six (6) months, an extension of ninety (90) Days may be granted;

13.9.1(c) If the Contract period exceeds one (1) year, besides the extension granted in Article 13.9.1(b), an additional thirty (30) Days may be granted for each multiple of six (6) months involved beyond the one (1) year period; or

13.9.1(d) If exceptional circumstances exist, the ACCO may extend the time for performance beyond the extensions in Articles 13.9.1(a), 13.9.1(b), and 13.9.1(c). In that event, the ACCO shall file with the Mayor's Office of Contract Services a written explanation of the exceptional circumstances.

13.9.2 For extensions of time for Substantial Completion and final completion payments, the Engineer, in consultation with the ACCO, shall prepare a written analysis of the delay (including a preliminary determination of the causes of delay, the beginning and end dates for each such cause of delay, and whether the delays are excusable under the terms of this Contract). The report shall be subject to review by and approval of the Board, which shall have authority to question its analysis and determinations and request additional facts or documentation. The report as reviewed and made final by the Board shall be made a part of the Agency contract file. Neither the report itself nor anything contained therein shall operate as a waiver or release of any claim the City may have against the Contractor for either actual or liquidated damages.

13.9.3 Approval Mechanism for Time Extensions for Substantial Completion or Final Completion Payments: An extension shall be granted only with the approval of the Board which is comprised of the ACCO of the Agency, the City Corporation Counsel, and the Comptroller, or their authorized representatives.

13.9.4 Neither the granting of any application for an extension of time to the Contractor or any Other Contractor on this Project nor the papers, records or reports related to any application for or grant of an extension of time or determination related thereto shall be referred to or offered in evidence by the Contractor or its attorneys in any action or proceeding.

13.10 No Damage for Delay: The Contractor agrees to make no claim for damages for delay in the performance of this Contract occasioned by any act or omission to act of the City or any of its representatives, except as provided for in Article 11.

#### ARTICLE 14. COMPLETION AND FINAL ACCEPTANCE OF THE WORK

14.1 Date for Substantial Completion: The Contractor shall substantially complete the Work within the time fixed in Schedule A of the General Conditions, or within the time to which such Substantial Completion may be extended.

14.2 Determining the Date of Substantial Completion: The Work will be deemed to be substantially complete when the two conditions set forth below have been met.

14.2.1 Inspection: The Engineer 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 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 within ten (10) Days of the 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 proposes alternative dates, then, within a reasonable time after receipt, the Engineer, in a written notification to the Contractor, shall approve the Contractor's completion dates or, if they are unable to agree, the Engineer shall establish dates for the completion of each item of Work. If the Contractor neither accepts the dates nor proposes alternative dates within ten (10) Days, the schedule proposed by the Engineer shall be deemed accepted. 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, 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 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 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 inspection if, upon such inspection, the Engineer finds that all items on the Final Approved Punch List are complete and no further Work remains to be done. The Commissioner will then issue a written determination of Final Acceptance.

14.5 Request for Inspection: Inspection of the Work by the Engineer for the purpose of Substantial Completion or Final Acceptance shall be made within ten (10) 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 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 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 shall be made within ten (10) Days after receipt of the Contractor's written request therefor.

14.7 Initiation of Inspection by the 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 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 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 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](http://www.nyc.gov/pip).<sup>1</sup> 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 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.

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<sup>1</sup> 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](http://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](mailto:pip@fisa.nyc.gov).

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.

20.4 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, at [http://www.nyc.gov/html/dob/downloads/rules/1\\_RCNY\\_101-08.pdf](http://www.nyc.gov/html/dob/downloads/rules/1_RCNY_101-08.pdf), the Contractor shall provide Commercial General Liability Insurance with limits of at least those required by 1 RCNY section 101-08. If the Work does not require such a permit, the minimum limits shall be those provided for in Schedule A.

22.1.1(d) If any of the Work includes repair of a waterborne vessel owned by or to be delivered to the City, such Commercial General Liability shall include, or be endorsed to include, Ship Repairer's Legal Liability Coverage to protect against, without limitation, liability arising from navigation of such vessels prior to delivery to and acceptance by the City.

22.1.2 Workers' Compensation Insurance, Employers' Liability Insurance, and Disability Benefits Insurance: The Contractor shall provide, and shall cause its Subcontractors to provide, Workers Compensation Insurance, Employers' Liability Insurance, and Disability Benefits Insurance in accordance with the Laws of the State of New York on behalf of all employees providing services under this Contract (except for those employees, if any, for which the Laws require insurance only pursuant to Article 22.1.3).

22.1.3 United States Longshoremen's and Harbor Workers Act and/or Jones Act Insurance: If specified in Schedule A of the General Conditions or if required by Law, the Contractor shall provide insurance in accordance with the United States Longshoremen's and Harbor Workers Act and/or the Jones Act, on behalf of all qualifying employees providing services under this Contract.

22.1.4 Builders Risk Insurance: If specified in Schedule A of the General Conditions, the Contractor shall provide Builders Risk Insurance on a completed value form for the total value of the Work through Substantial Completion of the Work in its entirety. Such insurance shall be provided on an All Risk basis and include coverage, without limitation, for windstorm (including named windstorm), storm surge, flood and earth movement. Unless waived by the Commissioner, it shall include coverage for ordinance and law, demolition and increased costs of construction, debris removal, pollutant clean up and removal, and expediting costs. Such insurance shall cover, without limitation, (a) all buildings and/or structures involved in the Work, as well as temporary structures at the Site, and (b) any property that is intended to become a permanent part of such building or structure, whether such property is on the Site, in transit or in temporary storage. Policies shall name the Contractor as Named Insured and list the City as both an Additional Insured and a Loss Payee as its interest may appear.

22.1.4(a) Policies of such insurance shall specify that, in the event a loss occurs at an occupied facility, occupancy of such facility is permitted without the consent of the issuing insurance company.

22.1.4(b) Such insurance may be provided through an Installation Floater, at the Contractor's option, if it otherwise conforms with the requirements of this Article 22.1.4.

22.1.5 Commercial Automobile Liability Insurance: The Contractor shall provide Commercial Automobile Liability Insurance for liability arising out of ownership, maintenance or use of any owned (if any), non-owned and hired vehicles to be used in connection with this Contract. Coverage shall be at least as broad as the latest edition of ISO Form CA0001. If vehicles are used for transporting hazardous materials, the Automobile Liability Insurance shall be endorsed to provide pollution liability broadened coverage for covered vehicles (endorsement CA 99 48) as well as proof of MCS 90.

22.1.6 Contractors Pollution Liability Insurance: If specified in Schedule A of the General Conditions, the Contractor shall maintain, or cause the Subcontractor doing such Work to maintain, Contractors Pollution Liability Insurance covering bodily injury and property damage. Such insurance shall provide coverage for actual, alleged or threatened emission, discharge, dispersal, seepage, release or escape of pollutants (including asbestos), including any loss, cost or expense incurred as a result of any cleanup of pollutants (including asbestos) or in the investigation, settlement or defense of any claim, action, or proceedings arising from the operations under this Contract. Such insurance shall be in the Contractor's name and list the City as an Additional Insured and any other entity specified in Schedule A. Coverage shall include, without limitation, (a) loss of use of damaged property or of property that has not been physically injured, (b) transportation, and (c) non-owned disposal sites.

22.1.6(a) Coverage for the City as Additional Insured shall specifically include the City's officials and employees and be at least as broad as provided to the Contractor for this Project.

22.1.6(b) If such insurance is written on a claims-made policy, such policy shall have a retroactive date on or before the effective date of this Contract, and continuous coverage shall be maintained, or an extended discovery period exercised, for a period of not less than three (3) years from the time the Work under this Contract is completed.

22.1.7 Marine Insurance:

22.1.7(a) Marine Protection and Indemnity Insurance: If specified in Schedule A of the General Conditions or if the Contractor engages in marine operations in the execution of any part of the Work, the Contractor shall maintain, or cause the Subcontractor doing such Work to maintain, Marine Protection and Indemnity Insurance with coverage at least as broad as Form SP-23. The insurance shall provide coverage for the Contractor or Subcontractor (whichever is doing this Work) and for the City (together with its officials and employees) and any other entity specified in Schedule A as an Additional Insured for bodily injury and property damage arising from marine operations under this Contract. Coverage shall include, without limitation, injury or death of crew members (if not fully provided through other insurance), removal of wreck, damage to piers, wharves and other fixed or floating objects and loss of or damage to any other vessel or craft, or to property on such other vessel or craft.

22.1.7(b) Hull and Machinery Insurance: If specified in Schedule A of the General Conditions or if the Contractor engages in marine operations in the execution of any part of the Work, the Contractor shall maintain, or cause the Subcontractor doing such Work to maintain, Hull and Machinery Insurance with coverage for the Contractor or Subcontractor (whichever is doing this Work) and for the City (together with its officials and employees) as Additional Insured at least as broad as the latest edition of American Institute Tug Form for all tugs used under this Contract and Collision Liability at least as broad as the latest edition of American Institute Hull Clauses.

22.1.7(c) Marine Pollution Liability Insurance: If specified in Schedule A of the General Conditions or if the Contractor engages in marine operations in the execution of any part of the Work, the Contractor shall maintain, or cause the Subcontractor doing such Work to maintain, Marine Pollution Liability Insurance covering itself (or the Subcontractor doing such Work) as Named Insured and the City (together with its officials and employees) and any other entity specified in Schedule A as an Additional Insured. Coverage shall be at least as broad as that provided by the latest edition of Water Quality Insurance Syndicate Form and include, without limitation, liability arising from the discharge or substantial threat of a discharge of oil, or from the release or threatened release of a hazardous substance including injury to, or economic losses resulting from, the destruction of or damage to real property, personal property or natural resources.

22.1.8 The Contractor shall provide such other types of insurance, at such minimum limits and with such conditions, as are specified in Schedule A of the General Conditions.

## 22.2 General Requirements for Insurance Coverage and Policies:

22.2.1 All required insurance policies shall be maintained with companies that may lawfully issue the required policy and have an A.M. Best rating of at least A-/VII or a Standard and Poor's rating of at least A, unless prior written approval is obtained from the City Corporation Counsel.

22.2.2 The Contractor shall be solely responsible for the payment of all premiums for all required policies and all deductibles and self-insured retentions to which such policies are subject, whether or not the City is an insured under the policy.

22.2.3 In his/her sole discretion, the Commissioner may, subject to the approval of the Comptroller and the City Corporation Counsel, accept Letters of Credit and/or custodial accounts in lieu of required insurance.

22.2.4 The City's limits of coverage for all types of insurance required pursuant to Schedule A of the General Conditions shall be the greater of (i) the minimum limits set forth in Schedule A or (ii) the limits provided to the Contractor as Named Insured under all primary, excess, and umbrella policies of that type of coverage.

22.2.5 The Contractor may satisfy its insurance obligations under this Article 22 through primary policies or a combination of primary and excess/umbrella policies, so long as all policies provide the scope of coverage required herein.

22.2.6 Policies of insurance provided pursuant to this Article 22 shall be primary and non-contributing to any insurance or self-insurance maintained by the City.

### 22.3 Proof of Insurance:

22.3.1 For all types of insurance required by Article 22.1 and Schedule A, except for insurance required by Articles 22.1.4 and 22.1.7, the **Contractor** shall file proof of insurance in accordance with this Article 22.3 within ten (10) **Days** of award. For insurance provided pursuant to Articles 22.1.4 and 22.1.7, proof shall be filed by a date specified by the **Commissioner** or ten (10) **Days** prior to the commencement of the portion of the **Work** covered by such policy, whichever is earlier.

22.3.2 For Workers' Compensation Insurance provided pursuant to Article 22.1.2, the **Contractor** shall submit one of the following forms: C-105.2 Certificate of Workers' Compensation Insurance; U-26.3 - State Insurance Fund Certificate of Workers' Compensation Insurance; Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the **Commissioner**. For Disability Benefits Insurance provided pursuant to Article 22.1.2, the **Contractor** shall submit DB-120.1 - Certificate Of Insurance Coverage Under The NYS Disability Benefits Law, Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the **Commissioner**. ACORD forms are not acceptable.

22.3.3 For policies provided pursuant to all of Article 22.1 other than Article 22.1.2, the **Contractor** shall submit one or more Certificates of Insurance on forms acceptable to the **Commissioner**. All such Certificates of Insurance shall certify (a) the issuance and effectiveness of such policies of insurance, each with the specified minimum limits (b) for insurance secured pursuant to Article 22.1.1 that the **City** and any other entity specified in Schedule A is an Additional Insured with coverage at least as broad as the most recent edition of ISO Forms CG 20 10, CG 20 37, and CG 20 26, as applicable; (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 Broker" in the form contained in Part III of Schedule A or copies of all policies referenced in such Certificate of Insurance as certified by an authorized representative of the issuing insurance carrier. If any policy is not available at the time of submission, certified binders may be submitted until such time as the policy is available, at which time a certified copy of the policy shall be submitted.

22.3.4 Documentation confirming renewals of insurance shall be submitted to the **Commissioner** prior to the expiration date of coverage of policies required under this **Contract**. Such proofs of insurance shall comply with the requirements of Articles 22.3.2 and 22.3.3.

22.3.5 The **Contractor** shall be obligated to provide the **City** with a copy of any policy of insurance provided pursuant to this Article 22 upon the demand for such policy by the **Commissioner** or the **City Corporation Counsel**.

### 22.4 Operations of the Contractor:

22.4.1 The **Contractor** shall not commence the **Work** unless and until all required certificates have been submitted to and accepted by the **Commissioner**. Acceptance by the **Commissioner** of a certificate does not excuse the **Contractor** from securing insurance

consistent with all provisions of this Article 22 or of any liability arising from its failure to do so.

22.4.2 The **Contractor** shall be responsible for providing continuous insurance coverage in the manner, form, and limits required by this **Contract** and shall be authorized to perform **Work** only during the effective period of all required coverage.

22.4.3 In the event that any of the required insurance policies lapse, are revoked, suspended or otherwise terminated, for whatever cause, the **Contractor** shall immediately stop all **Work**, and shall not recommence **Work** until authorized in writing to do so by the **Commissioner**. Upon quitting the Site, except as otherwise directed by the **Commissioner**, the **Contractor** shall leave all plant, materials, equipment, tools, and supplies on the Site. **Contract** time shall continue to run during such periods and no extensions of time will be granted. The **Commissioner** may also declare the **Contractor** in default for failure to maintain required insurance.

22.4.4 In the event the **Contractor** receives notice, from an insurance company or other person, that any insurance policy required under this Article 22 shall be cancelled or terminated (or has been cancelled or terminated) for any reason, the **Contractor** shall immediately forward a copy of such notice to both the **Commissioner** and the New York City Comptroller, attn: Office of Contract Administration, Municipal Building, One Centre Street, room 1005, New York, New York 10007. Notwithstanding the foregoing, the **Contractor** shall ensure that there is no interruption in any of the insurance coverage required under this Article 22.

22.4.5 Where notice of loss, damage, occurrence, accident, claim or suit is required under an insurance policy maintained in accordance with this Article 22, the **Contractor** shall notify in writing all insurance carriers that issued potentially responsive policies of any such event relating to any operations under this **Contract** (including notice to Commercial General Liability insurance carriers for events relating to the **Contractor's** own employees) no later than 20 days after such event. For any policy where the City is an Additional Insured, such notice shall expressly specify that "this notice is being given on behalf of the City of New York as Insured as well as the Named Insured." Such notice shall also contain the following information: the number of the insurance policy, the name of the named insured, the date and location of the damage, occurrence, or accident, and the identity of the persons or things injured, damaged or lost. The **Contractor** shall simultaneously send a copy of such notice to the City of New York c/o Insurance Claims Specialist, Affirmative Litigation Division, New York City Law Department, 100 Church Street, New York, New York 10007.

22.4.6 In the event of any loss, accident, claim, action, or other event that does or can give rise to a claim under any insurance policy required under this Article 22, the **Contractor** shall at all times fully cooperate with the City with regard to such potential or actual claim.

22.5 **Subcontractor Insurance:** In the event the **Contractor** requires any **Subcontractor** to procure insurance with regard to any operations under this **Contract** and requires such **Subcontractor** to name the **Contractor** as an **Additional Insured** thereunder, the **Contractor** shall ensure that the **Subcontractor** name the City, including its officials and employees, as an **Additional Insured** with coverage at least as broad as the most recent edition of ISO Form CG 20 26.

22.6 Wherever reference is made in Article 7 or this Article 22 to documents to be sent to the **Commissioner** (e.g., notices, filings, or submissions), such documents shall be sent to the address set forth in Schedule A of the General Conditions. In the event no address is set forth in Schedule A, such documents are to be sent to the **Commissioner's** address as provided elsewhere in this **Contract**.

22.7 Apart from damages or losses covered by insurance provided pursuant to Articles 22.1.2, 22.1.3, or 22.1.5, the **Contractor** waives all rights against the **City**, including its officials and employees, for any damages or losses that are covered under any insurance required under this Article 22 (whether or not such insurance is actually procured or claims are paid thereunder) or any other insurance applicable to the operations of the **Contractor** and/or its employees, agents, or **Subcontractors**.

22.8 In the event the **Contractor** utilizes a self-insurance program to satisfy any of the requirements of this Article 22, the **Contractor** shall ensure that any such self-insurance program provides the **City** with all rights that would be provided by traditional insurance under this Article 22, including but not limited to the defense and indemnification obligations that insurers are required to undertake in liability policies.

22.9 Materiality/Non-Waiver: The **Contractor's** failure to secure policies in complete conformity with this Article 22, or to give an insurance company timely notice of any sort required in this **Contract** or to do anything else required by this Article 22 shall constitute a material breach of this **Contract**. Such breach shall not be waived or otherwise excused by any action or inaction by the **City** at any time.

22.10 Pursuant to General Municipal Law Section 108, this **Contract** shall be void and of no effect unless **Contractor** maintains Workers' Compensation Insurance for the term of this **Contract** to the extent required and in compliance with the New York State Workers' Compensation Law.

22.11 Other Remedies: Insurance coverage provided pursuant to this Article 22 or otherwise shall not relieve the **Contractor** of any liability under this **Contract**, nor shall it preclude the **City** from exercising any rights or taking such other actions available to it under any other provisions of this **Contract** or **Law**.

### ARTICLE 23. MONEY RETAINED AGAINST CLAIMS

23.1 If any claim shall be made by any person or entity (including **Other Contractors** with the **City** on this **Project**) against the **City** or against the **Contractor** and the **City** for any of the following:

- (a) An alleged loss, damage, injury, theft or vandalism of any of the kinds referred to in Articles 7 and 12, plus the reasonable costs of defending the **City**, which in the opinion of the **Comptroller** may not be paid by an insurance company (for any reason whatsoever); or
- (b) An infringement of copyrights, patents or use of patented articles, tools, etc., as referred to in Article 57; or
- (c) Damage claimed to have been caused directly or indirectly by the failure of the **Contractor** to perform the **Work** in strict accordance with this **Contract**,

the amount of such claim, or so much thereof as the **Comptroller** may deem necessary, may be withheld by the **Comptroller**, as security against such claim, from any money due hereunder. The **Comptroller**, in his/her discretion, may permit the **Contractor** to substitute other satisfactory security in lieu of the monies so withheld.

23.2 If an action on such claim is timely commenced and the liability of the **City**, or the **Contractor**, or both, shall have been established therein by a final judgment of a court of competent jurisdiction, or if such claim shall have been admitted by the **Contractor** to be valid, the **Comptroller**



shall pay such judgment or admitted claim out of the monies retained by the **Comptroller** under the provisions of this Article 23, and return the balance, if any, without interest, to the **Contractor**.

#### ARTICLE 24. MAINTENANCE AND GUARANTY

24.1 The **Contractor** shall promptly repair, replace, restore or rebuild, as the **Commissioner** may determine, any finished **Work** in which defects of materials or workmanship may appear or to which damage may occur because of such defects, during the one (1) year period subsequent to the date of **Substantial Completion** (or use and occupancy in accordance with Article 16), except where other periods of maintenance and guaranty are provided for in Schedule A.

24.2 As security for the faithful performance of its obligations hereunder, the **Contractor**, upon filing its requisition for payment on **Substantial Completion**, shall deposit with the **Commissioner** a sum equal to one (1%) percent of the price (or the amount fixed in Schedule A of the General Conditions) in cash or certified check upon a state or national bank and trust company or a check of such bank and trust company signed by a duly authorized officer thereof and drawn to the order of the **Comptroller**, or obligations of the **City**, which the **Comptroller** may approve as of equal value with the sum so required.

24.3 In lieu of the above, the **Contractor** may make such security payment to the **City** by authorizing the **Commissioner** in writing to deduct the amount from the **Substantial Completion** payment which shall be deemed the deposit required above.

24.4 If the **Contractor** has faithfully performed all of its obligations hereunder the **Commissioner** shall so certify to the **Comptroller** within five (5) Days after the expiration of one (1) year from the date of **Substantial Completion** and acceptance of the **Work** or within thirty (30) Days after the expiration of the guarantee period fixed in the **Specifications**. The security payment shall be repaid to the **Contractor** without interest within thirty (30) Days after certification by the **Commissioner** to the **Comptroller** that the **Contractor** has faithfully performed all of its obligations hereunder.

24.5 Notice by the **Commissioner** to the **Contractor** to repair, replace, rebuild or restore such defective or damaged **Work** shall be timely, pursuant to this article, if given not later than ten (10) Days subsequent to the expiration of the one (1) year period or other periods provided for herein.

24.6 If the **Contractor** shall fail to repair, replace, rebuild or restore such defective or damaged **Work** promptly after receiving such notice, the **Commissioner** shall have the right to have the **Work** done by others in the same manner as provided for in the completion of a defaulted **Contract**, under Article 51.

24.7 If the security payment so deposited is insufficient to cover the cost of such **Work**, the **Contractor** shall be liable to pay such deficiency on demand by the **Commissioner**.

24.8 The **Engineer's** certificate setting forth the fair and reasonable cost of repairing, replacing, rebuilding or restoring any damaged or defective **Work** when performed by one other than the **Contractor**, shall be binding and conclusive upon the **Contractor** as to the amount thereof.

24.9 The **Contractor** shall obtain all manufacturers' warranties and guaranties of all equipment and materials required by this **Contract** in the name of the **City** and shall deliver same to the **Commissioner**. All of the **City's** rights and title and interest in and to said manufacturers' warranties and guaranties may be assigned by the **City** to any subsequent purchasers of such equipment and materials or lessees of the premises into which the equipment and materials have been installed.

CHAPTER VI  
CHANGES, EXTRA WORK, AND DOCUMENTATION OF CLAIM

ARTICLE 25. CHANGES

25.1 Changes may be made to this Contract only as duly authorized in writing by the Commissioner in accordance with the Law and this Contract. All such changes, modifications, and amendments will become a part of the Contract. Work so ordered shall be performed by the Contractor.

25.2 Contract changes will be made only for Work necessary to complete the Work included in the original scope of the Contract and/or for non-material changes to the scope of the Contract. Changes are not permitted for any material alteration in the scope of Work in the Contract.

25.3 The Contractor shall be entitled to a price adjustment for Extra Work performed pursuant to a written change order. Adjustments to price shall be computed in one or more of the following ways:

25.3.1 By applicable unit prices specified in the Contract; and/or

25.3.2 By agreement of a fixed price; and/or

25.3.3 By time and material records; and/or

25.3.4 In any other manner approved by the CCPO.

25.4 All payments for change orders are subject to pre-audit by the Engineering Audit Officer and may be post-audited by the Comptroller and/or the Agency.

ARTICLE 26. METHODS OF PAYMENT FOR OVERRUNS AND EXTRA WORK

26.1 Overrun of Unit Price Item: An overrun is any quantity of a unit price item which the Contractor is directed to provide which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule.

26.1.1 For any unit price item, the Contractor will be paid at the unit price bid for any quantity up to one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule. If during the progress of the Work, the actual quantity of any unit price item required to complete the Work approaches the estimated quantity for that item, and for any reason it appears that the actual quantity of any unit price item necessary to complete the Work will exceed the estimated quantity for that item by twenty-five (25%) percent, the Contractor shall immediately notify the Engineer of such anticipated overrun. The Contractor shall not be compensated for any quantity of a unit price item provided which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule without written authorization from the Engineer.

26.1.2 If the actual quantity of any unit price item necessary to complete the Work will exceed one hundred twenty five (125%) percent of the estimated quantity for that item set forth in the bid schedule, the City reserves the right and the Contractor agrees to negotiate a new unit price for such item. In no event shall such negotiated new unit price exceed the unit bid price. If the City and Contractor cannot agree on a new unit price, then the City shall order the Contractor and the Contractor agrees to provide additional quantities of the

item on the basis of time and material records for the actual and reasonable cost as determined under Article 26.2, but in no event at a unit price exceeding the unit price bid.

26.2 **Extra Work:** For **Extra Work** where payment is by agreement on a fixed price in accordance with Article 25.3.2, the price to be paid for such **Extra Work** shall be based on the fair and reasonable estimated cost of the items set forth below. For **Extra Work** where payment is based on time and material records in accordance with Article 25.3.3, the price to be paid for such **Extra Work** shall be the actual and reasonable cost of the items set forth below, calculated in accordance with the formula specified therein, if any.

26.2.1 Necessary materials (including transportation to the Site); plus

26.2.2 Necessary direct labor, including payroll taxes (subject to statutory wage caps) and supplemental benefits; plus

26.2.3 Sales and personal property taxes, if any, required to be paid on materials not incorporated into such **Extra Work**; plus

26.2.4 Reasonable rental value of **Contractor-owned** (or **Subcontractor-owned**, as applicable), necessary plant and equipment other than **Small Tools**, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per operating hour:  $(.035) \times (\text{HP rating}) \times (\text{Fuel cost/gallon})$ . Reasonable rental value is defined as the lower of either seventy-five percent of the monthly prorated rental rates established in "The AED Green Book, Rental Rates and Specifications for Construction Equipment" published by Equipment Watch (the "Green Book"), or seventy-five percent of the monthly prorated rental rates established in the "Rental Rate Blue Book for Construction Equipment" published by Equipment Watch (the "Blue Book") (the applicable Blue Book rate being for rental only without the addition of any operational costs listed in the Blue Book). The reasonable rental value is deemed to be inclusive of all operating costs except for fuel/energy consumption and equipment operator's wages/costs. For multiple shift utilization, reimbursement shall be calculated as follows: first shift shall be seventy-five (75%) percent of such rental rates; second shift shall be sixty (60%) percent of the first shift rate; and third shift shall be forty (40%) percent of the first shift rate. Equipment on standby shall be reimbursed at one-third (1/3) the prorated monthly rental rate. **Contractor-owned** (or **Subcontractor-owned**, as applicable) equipment includes equipment from rental companies affiliated with or controlled by the **Contractor** (or **Subcontractor**, as applicable), as determined by the **Commissioner**. In establishing cost reimbursement for non-operating **Contractor-owned** (or **Subcontractor-owned**, as applicable) equipment (scaffolding, sheeting systems, road plates, etc.), the City may restrict reimbursement to a purchase-salvage/life cycle basis if less than the computed rental costs; plus

26.2.5 Necessary installation and dismantling of such plant and equipment, including transportation to and from the Site, if any, provided that, in the case of non-**Contractor-owned** (or non-**Subcontractor-owned**, as applicable) equipment rented from a third party, the cost of installation and dismantling are not allowable if such costs are included in the rental rate; plus

26.2.6 Necessary fees charged by governmental entities; plus

26.2.7 Necessary construction-related service fees charged by non-governmental entities, such as landfill tipping fees; plus

26.2.8 Reasonable rental costs of non-Contractor-owned (or non-Subcontractor-owned, as applicable) necessary plant and equipment other than **Small Tools**, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per hour of operation:  $(.035) \times (\text{HP rating}) \times (\text{Fuel cost/gallon})$ . In lieu of renting, the City reserves the right to direct the purchase of non-operating equipment (scaffolding, sheeting systems, road plates, etc.), with payment on a purchase-salvage/life cycle basis, if less than the projected rental costs; plus

26.2.9 Workers' Compensation Insurance, and any insurance coverage expressly required by the City for the performance of the **Extra Work** which is different than the types of insurance required by Article 22 and Schedule A of the General Conditions. The cost of Workers' Compensation Insurance is subject to applicable payroll limitation caps and shall be based upon the carrier's Manual Rate for such insurance derived from the applicable class Loss Cost ("LC") and carrier's Lost Cost Multiplier ("LCM") approved by the New York State Department of Financial Services, and with the exception of experience rating, rate modifiers as promulgated by the New York Compensation Insurance Rating Board ("NYCIRB"); plus

26.2.10 Additional costs incurred as a result of the **Extra Work** for performance and payment bonds; plus

26.2.11 Twelve percent (12%) percent of the total of items in Articles 26.2.1 through 26.2.5 as compensation for overhead, except that no percentage for overhead will be allowed on **Payroll Taxes** or on the premium portion of overtime pay or on sales and personal property taxes. Overhead shall include without limitation, all costs and expenses in connection with administration, management superintendence, small tools, and insurance required by Schedule A of the General Conditions other than Workers' Compensation Insurance; plus

26.2.12 Ten (10%) percent of the total of items in Articles 26.2.1 through 26.2.5, plus the items in Article 26.2.11, as compensation for profit, except that no percentage for profit will be allowed on **Payroll Taxes** or on the premium portion of overtime pay or on sales and personal property taxes; plus

26.2.13 Five (5%) percent of the total of items in Articles 26.2.6 through 26.2.10 as compensation for overhead and profit.

26.3 Where the **Extra Work** is performed in whole or in part by other than the Contractor's own forces pursuant to Article 26.2, the Contractor shall be paid, subject to pre-audit by the **Engineering Audit Officer**, the cost of such Work computed in accordance with Article 26.2 above, plus an additional allowance of five (5%) percent to cover the Contractor's overhead and profit.

26.4 Where a change is ordered, involving both **Extra Work** and omitted or reduced **Contract Work**, the **Contract** price shall be adjusted, subject to pre-audit by the **EAO**, in an amount based on the difference between the cost of such **Extra Work** and of the omitted or reduced **Work**.

26.5 Where the Contractor and the Commissioner can agree upon a fixed price for **Extra Work** in accordance with Article 25.3.2 or another method of payment for **Extra Work** in accordance with Article

25.3.4, or for Extra Work ordered in connection with omitted Work, such method, subject to pre-audit by the EAO, may, at the option of the Commissioner, be substituted for the cost plus a percentage method provided in Article 26.2; provided, however, that if the Extra Work is performed by a Subcontractor, the Contractor shall not be entitled to receive more than an additional allowance of five (5%) percent for overhead and profit over the cost of such Subcontractor's Work as computed in accordance with Article 26.2.

## ARTICLE 27. RESOLUTION OF DISPUTES

27.1 All disputes between the City and the Contractor of the kind delineated in this Article 27.1 that arise under, or by virtue of, this Contract shall be finally resolved in accordance with the provisions of this Article 27 and the PPB Rules. This procedure for resolving all disputes of the kind delineated herein shall be the exclusive means of resolving any such disputes.

27.1.1 This Article 27 shall not apply to disputes concerning matters dealt with in other sections of the PPB Rules, or to disputes involving patents, copyrights, trademarks, or trade secrets (as interpreted by the courts of New York State) relating to proprietary rights in computer software.

27.1.2 This Article 27 shall apply only to disputes about the scope of Work delineated by the Contract, the interpretation of Contract documents, the amount to be paid for Extra Work or disputed work performed in connection with the Contract, the conformity of the Contractor's Work to the Contract, and the acceptability and quality of the Contractor's Work; such disputes arise when the Engineer, Resident Engineer, Engineering Audit Officer, or other designee of the Commissioner makes a determination with which the Contractor disagrees.

27.2 All determinations required by this Article 27 shall be made in writing clearly stated, with a reasoned explanation for the determination based on the information and evidence presented to the party making the determination. Failure to make such determination within the time required by this Article 27 shall be deemed a non-determination without prejudice that will allow application to the next level.

27.3 During such time as any dispute is being presented, heard, and considered pursuant to this Article 27, the Contract terms shall remain in force and the Contractor shall continue to perform Work as directed by the ACCO or the Engineer. Failure of the Contractor to continue Work as directed shall constitute a waiver by the Contractor of its claim.

27.4 Presentation of Disputes to Commissioner.

Notice of Dispute and Agency Response. The Contractor shall present its dispute in writing ("Notice of Dispute") to the Commissioner within thirty (30) Days of receiving written notice of the determination or action that is the subject of the dispute. This notice requirement shall not be read to replace any other notice requirements contained in the Contract. The Notice of Dispute shall include all the facts, evidence, documents, or other basis upon which the Contractor relies in support of its position, as well as a detailed computation demonstrating how any amount of money claimed by the Contractor in the dispute was arrived at. Within thirty (30) Days after receipt of the detailed written submission comprising the complete Notice of Dispute, the Engineer, Resident Engineer, Engineering Audit Officer, or other designee of the Commissioner shall submit to the Commissioner all materials he or she deems pertinent to the dispute. Following initial submissions to the Commissioner, either party may demand of the other the production of any document or other material the demanding party believes may be relevant to the dispute. The requested party shall produce all relevant materials that are not otherwise

protected by a legal privilege recognized by the courts of New York State. Any question of relevancy shall be determined by the **Commissioner** whose decision shall be final. Willful failure of the **Contractor** to produce any requested material whose relevancy the **Contractor** has not disputed, or whose relevancy has been affirmatively determined, shall constitute a waiver by the **Contractor** of its claim.

27.4.1 **Commissioner Inquiry.** The **Commissioner** shall examine the material and may, in his or her discretion, convene an informal conference with the **Contractor**, the **ACCO**, and the **Engineer, Resident Engineer, Engineering Audit Officer**, or other designee of the **Commissioner** to resolve the issue by mutual consent prior to reaching a determination. The **Commissioner** may seek such technical or other expertise as he or she shall deem appropriate, including the use of neutral mediators, and require any such additional material from either or both parties as he or she deems fit. The **Commissioner's** ability to render, and the effect of, a decision hereunder shall not be impaired by any negotiations in connection with the dispute presented, whether or not the **Commissioner** participated therein. The **Commissioner** may or, at the request of any party to the dispute, shall compel the participation of any **Other Contractor** with a contract related to the **Work** of this **Contract**, and that **Contractor** shall be bound by the decision of the **Commissioner**. Any **Other Contractor** thus brought into the dispute resolution proceeding shall have the same rights and obligations under this Article 27 as the **Contractor** initiating the dispute.

27.4.2 **Commissioner Determination.** Within thirty (30) Days after the receipt of all materials and information, or such longer time as may be agreed to by the parties, the **Commissioner** shall make his or her determination and shall deliver or send a copy of such determination to the **Contractor**, the **ACCO**, and **Engineer, Resident Engineer, Engineering Audit Officer**, or other designee of the **Commissioner**, as applicable, together with a statement concerning how the decision may be appealed.

27.4.3 **Finality of Commissioner's Decision.** The **Commissioner's** decision shall be final and binding on all parties, unless presented to the Contract Dispute Resolution Board pursuant to this Article 27. The **City** may not take a petition to the Contract Dispute Resolution Board. However, should the **Contractor** take such a petition, the **City** may seek, and the Contract Dispute Resolution Board may render, a determination less favorable to the **Contractor** and more favorable to the **City** than the decision of the **Commissioner**.

27.5 **Presentation of Dispute to the Comptroller.** Before any dispute may be brought by the **Contractor** to the Contract Dispute Resolution Board, the **Contractor** must first present its claim to the **Comptroller** for his or her review, investigation, and possible adjustment.

27.5.1 **Time, Form, and Content of Notice.** Within thirty (30) Days of its receipt of a decision by the **Commissioner**, the **Contractor** shall submit to the **Comptroller** and to the **Commissioner** a Notice of Claim regarding its dispute with the **Agency**. The Notice of Claim shall consist of (i) a brief written statement of the substance of the dispute, the amount of money, if any, claimed and the reason(s) the **Contractor** contends the dispute was wrongly decided by the **Commissioner**; (ii) a copy of the written decision of the **Commissioner**; and (iii) a copy of all materials submitted by the **Contractor** to the **Agency**, including the Notice of Dispute. The **Contractor** may not present to the **Comptroller** any material not presented to the **Commissioner**, except at the request of the **Comptroller**.

27.5.2 **Response.** Within thirty (30) Days of receipt of the Notice of Claim, the **Agency** shall make available to the **Comptroller** a copy of all material submitted by the **Agency** to the **Commissioner** in connection with the dispute. The **Agency** may not present to the

Comptroller any material not presented to the Commissioner except at the request of the Comptroller.

27.5.3 **Comptroller Investigation.** The Comptroller may investigate the claim in dispute and, in the course of such investigation, may exercise all powers provided in Sections 7-201 and 7-203 of the Administrative Code. In addition, the Comptroller may demand of either party, and such party shall provide, whatever additional material the Comptroller deems pertinent to the claim, including original business records of the Contractor. Willful failure of the Contractor to produce within fifteen (15) Days any material requested by the Comptroller shall constitute a waiver by the Contractor of its claim. The Comptroller may also schedule an informal conference to be attended by the Contractor, Agency representatives, and any other personnel desired by the Comptroller.

27.5.4 **Opportunity of Comptroller to Compromise or Adjust Claim.** The Comptroller shall have forty-five (45) Days from his or her receipt of all materials referred to in Article 27.5.3 to investigate the disputed claim. The period for investigation and compromise may be further extended by agreement between the Contractor and the Comptroller, to a maximum of ninety (90) Days from the Comptroller's receipt of all materials. The Contractor may not present its petition to the Contract Dispute Resolution Board until the period for investigation and compromise delineated in this Article 27.5.4 has expired. In compromising or adjusting any claim hereunder, the Comptroller may not revise or disregard the terms of the Contract between the parties.

27.6 **Contract Dispute Resolution Board.** There shall be a Contract Dispute Resolution Board composed of:

27.6.1 The chief administrative law judge of the Office of Administrative Trials and Hearings (OATH) or his/her designated OATH administrative law judge, who shall act as chairperson, and may adopt operational procedures and issue such orders consistent with this Article 27 as may be necessary in the execution of the Contract Dispute Resolution Board's functions, including, but not limited to, granting extensions of time to present or respond to submissions;

27.6.2 The CCPO or his/her designee; any designee shall have the requisite background to consider and resolve the merits of the dispute and shall not have participated personally and substantially in the particular matter that is the subject of the dispute or report to anyone who so participated; and

27.6.3 A person with appropriate expertise who is not an employee of the City. This person shall be selected by the presiding administrative law judge from a prequalified panel of individuals, established and administered by OATH with appropriate background to act as decision-makers in a dispute. Such individual may not have a contract or dispute with the City or be an officer or employee of any company or organization that does, or regularly represents persons, companies, or organizations having disputes with the City.

27.7 **Petition to the Contract Dispute Resolution Board.** In the event the claim has not been settled or adjusted by the Comptroller within the period provided in this Article 27, the Contractor, within thirty (30) Days thereafter, may petition the Contract Dispute Resolution Board to review the Commissioner's determination.

27.7.1 **Form and Content of Petition by Contractor.** The Contractor shall present its dispute to the Contract Dispute Resolution Board in the form of a petition, which shall

include (i) a brief written statement of the substance of the dispute, the amount of money, if any, claimed, and the reason(s) the **Contractor** contends the dispute was wrongly decided by the **Commissioner**; (ii) a copy of the written Decision of the **Commissioner**, (iii) copies of all materials submitted by the **Contractor** to the Agency; (iv) a copy of the written decision of the **Comptroller**, if any, and (v) copies of all correspondence with, or written material submitted by the **Contractor**, to the **Comptroller**. The **Contractor** shall concurrently submit four (4) complete sets of the Petition: one set to the City Corporation Counsel (Attn: Commercial and Real Estate Litigation Division) and three (3) sets to the Contract Dispute Resolution Board at OATH's offices with proof of service on the City Corporation Counsel. In addition, the **Contractor** shall submit a copy of the written statement of the substance of the dispute, cited in (i) above, to both the **Commissioner** and the **Comptroller**.

**27.7.2 Agency Response.** Within thirty (30) Days of its receipt of the Petition by the City Corporation Counsel, the Agency shall respond to the brief written statement of the **Contractor** and make available to the Contract Dispute Resolution Board all material it submitted to the **Commissioner** and **Comptroller**. Three (3) complete copies of the Agency response shall be provided to the Contract Dispute Resolution Board and one to the **Contractor**. Extensions of time for submittal of the Agency response shall be given as necessary upon a showing of good cause or, upon consent of the parties, for an initial period of up to thirty (30) Days.

**27.7.3 Further Proceedings.** The Contract Dispute Resolution Board shall permit the **Contractor** to present its case by submission of memoranda, briefs, and oral argument. The Contract Dispute Resolution Board shall also permit the Agency to present its case in response to the **Contractor** by submission of memoranda, briefs, and oral argument. If requested by the City Corporation Counsel, the **Comptroller** shall provide reasonable assistance in the preparation of the Agency's case. Neither the **Contractor** nor the Agency may support its case with any documentation or other material that was not considered by the **Comptroller**, unless requested by the Contract Dispute Resolution Board. The Contract Dispute Resolution Board, in its discretion, may seek such technical or other expert advice as it shall deem appropriate and may seek, on its own or upon application of a party, any such additional material from any party as it deems fit. The Contract Dispute Resolution Board, in its discretion, may combine more than one dispute between the parties for concurrent resolution.

**27.7.4 Contract Dispute Resolution Board Determination.** Within forty-five (45) Days of the conclusion of all written submissions and oral arguments, the Contract Dispute Resolution Board shall render a written decision resolving the dispute. In an unusually complex case, the Contract Dispute Resolution Board may render its decision in a longer period, not to exceed ninety (90) Days, and shall so advise the parties at the commencement of this period. The Contract Dispute Resolution Board's decision must be consistent with the terms of the **Contract**. Decisions of the Contract Dispute Resolution Board shall only resolve matters before the Contract Dispute Resolution Board and shall not have precedential effect with respect to matters not before the Contract Dispute Resolution Board.

**27.7.5 Notification of Contract Dispute Resolution Board Decision.** The Contract Dispute Resolution Board shall send a copy of its decision to the **Contractor**, the ACCO, the Engineer, the **Comptroller**, the City Corporation Counsel, the CCPO, and the PPB. A decision in favor of the **Contractor** shall be subject to the prompt payment provisions of the PPB Rules. The Required Payment Date shall be thirty (30) Days after the date the parties are formally notified of the Contract Dispute Resolution Board's decision.



27.7.6 Finality of Contract Dispute Resolution Board Decision. The Contract Dispute Resolution Board's decision shall be final and binding on all parties. Any party may seek review of the Contract Dispute Resolution Board's decision solely in the form of a challenge, filed within four (4) months of the date of the Contract Dispute Resolution Board's decision, in a court of competent jurisdiction of the State of New York, County of New York pursuant to Article 78 of the Civil Practice Law and Rules. Such review by the court shall be limited to the question of whether or not the Contract Dispute Resolution Board's decision was made in violation of lawful procedure, was affected by an error of Law, or was arbitrary and capricious or an abuse of discretion. No evidence or information shall be introduced or relied upon in such proceeding that was not presented to the Contract Dispute Resolution Board in accordance with this Article 27.

27.8 Any termination, cancellation, or alleged breach of the Contract prior to or during the pendency of any proceedings pursuant to this Article 27 shall not affect or impair the ability of the Commissioner or Contract Dispute Resolution Board to make a binding and final decision pursuant to this Article 27.

**ARTICLE 28. RECORD KEEPING FOR EXTRA OR DISPUTED WORK OR WORK ON A TIME & MATERIALS BASIS**

28.1 While the Contractor or any of its Subcontractors is performing Work on a time and material basis or Extra Work on a time and material basis ordered by the Commissioner under Article 25, or where the Contractor believes that it or any of its Subcontractors is performing Extra Work but a final determination by Agency has not been made, or the Contractor or any of its Subcontractors is performing disputed Work (whether on or off the Site), or complying with a determination or order under protest in accordance with Articles 11, 27, and 30, in each such case the Contractor shall furnish the Resident Engineer daily with three (3) copies of written statements signed by the Contractor's representative at the Site showing:

28.1.1 The name, trade, and number of each worker employed on such Work or engaged in complying with such determination or order, the number of hours employed, and the character of the Work each is doing; and

28.1.2 The nature and quantity of any materials, plant and equipment furnished or used in connection with the performance of such Work or compliance with such determination or order, and from whom purchased or rented.

28.2 A copy of such statement will be countersigned by the Resident Engineer, noting thereon any items not agreed to or questioned, and will be returned to the Contractor within two (2) Days after submission.

28.3 The Contractor and its Subcontractors, when required by the Commissioner, or the Comptroller, shall also produce for inspection, at the office of the Contractor or Subcontractor, any and all of its books, bid documents, financial statements, vouchers, records, daily job diaries and reports, and cancelled checks, and any other documents relating to showing the nature and quantity of the labor, materials, plant and equipment actually used in the performance of such Work, or in complying with such determination or order, and the amounts expended therefor, and shall permit the Commissioner and the Comptroller to make such extracts therefrom, or copies thereof, as they or either of them may desire.

28.4 In connection with the examination provided for herein, the Commissioner, upon demand therefor, will produce for inspection by the Contractor such records as the Agency may have with

respect to such **Extra Work** or disputed **Work** performed under protest pursuant to order of the **Commissioner**, except those records and reports which may have been prepared for the purpose of determining the accuracy and validity of the **Contractor's** claim.

28.5 Failure to comply strictly with these requirements shall constitute a waiver of any claim for extra compensation or damages on account of the performance of such **Work** or compliance with such determination or order.

#### ARTICLE 29. OMITTED WORK

29.1 If any **Contract Work** in a lump sum **Contract**, or if any part of a lump sum item in a unit price, lump sum, or percentage-bid **Contract** is omitted by the **Commissioner** pursuant to Article 33, the **Contract** price, subject to audit by the EAO, shall be reduced by a pro rata portion of the lump sum bid amount based upon the percent of **Work** omitted subject to Article 29.4. For the purpose of determining the pro rata portion of the lump sum bid amount, the bid breakdown submitted in accordance with Article 41 shall be considered, but shall not be the determining factor.

29.2 If the whole of a lump sum item or units of any other item is so omitted by the **Commissioner** in a unit price, lump sum, or percentage-bid **Contract**, then no payment will be made therefor except as provided in Article 29.4.

29.3 For units that have been ordered but are only partially completed, the unit price shall be reduced by a pro rata portion of the unit price bid based upon the percentage of **Work** omitted subject to Article 29.4.

29.4 In the event the **Contractor**, with respect to any omitted **Work**, has purchased any non-cancelable material and/or equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract**, but not yet incorporated into the **Work**, the **Contractor** shall be paid for such material and/or equipment in accordance with Article 64.2.1(b); provided, however, such payment is contingent upon the **Contractor's** delivery of such material and/or equipment in acceptable condition to a location designated by the **City**.

29.5 The **Contractor** agrees to make no claim for damages or for loss of overhead and profit with regard to any omitted **Work**.

#### ARTICLE 30. NOTICE AND DOCUMENTATION OF COSTS AND DAMAGES; PRODUCTION OF FINANCIAL RECORDS

30.1 If the **Contractor** shall claim to be sustaining damages by reason of any act or omission of the **City** or its agents, it shall submit to the **Commissioner** within forty-five (45) **Days** from the time such damages are first incurred, and every thirty (30) **Days** thereafter for as long as such damages are incurred, 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.

30.2 In addition to the foregoing statements, the Contractor shall, upon notice from the Commissioner, produce for examination at the Contractor's office, by the Engineer, Architect or Project Manager, all of its books of account, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books, and cancelled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this Contract, and submit itself and persons in its employment, for examination under oath by any person designated by the Commissioner or Comptroller to investigate claims made or disputes against the City under this Contract. At such examination, a duly authorized representative of the Contractor may be present.

30.3 In addition to the statements required under Article 28 and this Article 30, the Contractor and/or its Subcontractor shall, within thirty (30) Days upon notice from the Commissioner or Comptroller, produce for examination at the Contractor's and/or Subcontractor's office, by a representative of either the Commissioner or Comptroller, all of its books of account, bid documents, financial statements, accountant workpapers, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books, and cancelled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this Contract. Further, the Contractor and/or its Subcontractor shall submit any person in its employment, for examination under oath by any person designated by the Commissioner or Comptroller to investigate claims made or disputes against the City under this Contract. At such examination, a duly authorized representative of the Contractor may be present.

30.4 Unless the information and examination required under Article 30.3 is provided by the Contractor and/or its Subcontractor upon thirty (30) Days' notice from the Commissioner or Comptroller, or upon the Commissioner's or Comptroller's written authorization to extend the time to comply, the City shall be released from all claims arising under, relating to or by reason of this Contract, except for sums certified by the Commissioner to be due under the provisions of this Contract. It is further stipulated and agreed that no person has the power to waive any of the foregoing provisions and that in any action or dispute resolution procedure against the City to recover any sum in excess of the sums certified by the Commissioner to be due under or by reason of this Contract, the Contractor must allege in its complaint and prove, at trial or during such dispute resolution procedure, compliance with the provisions of this Article 30.

30.5 In addition, after the commencement of any action or dispute resolution procedure by the Contractor arising under or by reason of this Contract, the City shall have the right to require the Contractor to produce for examination under oath, up until the trial of the action or hearing before the Contract Dispute Resolution Board, the books and documents described in Article 30.3 and submit itself and all persons in its employ for examination under oath. If this Article 30 is not complied with as required, then the Contractor hereby consents to the dismissal of the action or dispute resolution procedure.

**CHAPTER VII**  
**POWERS OF THE RESIDENT ENGINEER,**  
**THE ENGINEER OR ARCHITECT AND THE COMMISSIONER**

**ARTICLE 31. THE RESIDENT ENGINEER**

31.1 The Resident Engineer shall have the power to inspect, supervise, and control the performance of the Work, subject to review by the Commissioner. The Resident Engineer shall not, however, have the power to issue an Extra Work order, except as specifically designated in writing by the Commissioner.

## ARTICLE 32. THE ENGINEER OR ARCHITECT OR PROJECT MANAGER

32.1 The **Engineer** or **Architect** or **Project Manager**, in addition to those matters elsewhere herein delegated to the **Engineer** and expressly made subject to his/her determination, direction or approval, shall have the power, subject to review by the **Commissioner**:

32.1.1 To determine the amount, quality, and location of the **Work** to be paid for hereunder; and

32.1.2 To determine all questions in relation to the **Work**, to interpret the **Contract Drawings, Specifications, and Addenda**, and to resolve all patent inconsistencies or ambiguities therein; and

32.1.3 To determine how the **Work** of this **Contract** shall be coordinated with **Work** of **Other Contractors** engaged simultaneously on this **Project**, including the power to suspend any part of the **Work**, but not the whole thereof; and

32.1.4 To make minor changes in the **Work** as he/she deems necessary, provided such changes do not result in a net change in the cost to the **City** or to the **Contractor** of the **Work** to be done under the **Contract**; and

32.1.5 To amplify the **Contract Drawings**, add explanatory information and furnish additional **Specifications** and drawings, consistent with this **Contract**.

32.2 The foregoing enumeration shall not imply any limitation upon the power of the **Engineer** or **Architect** or **Project Manager**, for it is the intent of this **Contract** that all of the **Work** shall generally be subject to his/her determination, direction, and approval, except where the determination, direction or approval of someone other than the **Engineer** or **Architect** or **Project Manager** is expressly called for herein.

32.3 The **Engineer** or **Architect** or **Project Manager** shall not, however, have the power to issue an **Extra Work** order, except as specifically designated in writing by the **Commissioner**.

## ARTICLE 33. THE COMMISSIONER

33.1 The **Commissioner**, in addition to those matters elsewhere herein expressly made subject to his/her determination, direction or approval, shall have the power:

33.1.1 To review and make determinations on any and all questions in relation to this **Contract** and its performance; and

33.1.2 To modify or change this **Contract** so as to require the performance of **Extra Work** (subject, however, to the limitations specified in Article 25) or the omission of **Contract Work**; and

33.1.3 To suspend the whole or any part of the **Work** whenever in his/her judgment such suspension is required:

33.1.3(a) In the interest of the **City** generally; or

33.1.3(b) To coordinate the Work of the various contractors engaged on this Project pursuant to the provisions of Article 12; or

33.1.3(c) To expedite the completion of the entire Project even though the completion of this particular Contract may thereby be delayed.

#### ARTICLE 34. NO ESTOPPEL

34.1 Neither the City nor any Agency, official, agent or employee thereof, shall be bound, precluded or estopped by any determination, decision, approval, order, letter, payment or certificate made or given under or in connection with this Contract by the City, the Commissioner, the Engineer, the Resident Engineer, or any other official, agent or employee of the City, either before or after the final completion and acceptance of the Work and payment therefor:

34.1.1 From showing the true and correct classification, amount, quality or character of the Work actually done; or that any such determination, decision, order, letter, payment or certificate was untrue, incorrect or improperly made in any particular, or that the Work, or any part thereof, does not in fact conform to the requirements of this Contract; and

34.1.2 From demanding and recovering from the Contractor any overpayment made to it, or such damages as the City may sustain by reason of the Contractor's failure to perform each and every part of its Contract.

### CHAPTER VIII LABOR PROVISIONS

#### ARTICLE 35. EMPLOYEES

35.1 The Contractor and its Subcontractors shall not employ on the Work:

35.1.1 Anyone who is not competent, faithful and skilled in the Work for which he/she shall be employed; and whenever the Commissioner shall inform the Contractor, in writing, that any employee is, in his/her opinion, incompetent, unfaithful or disobedient, that employee shall be discharged from the Work forthwith, and shall not again be employed upon it; or

35.1.2 Any labor, materials or means whose employment, or utilization during the course of this Contract, may tend to or in any way cause or result in strikes, work stoppages, delays, suspension of Work or similar troubles by workers employed by the Contractor or its Subcontractors, or by any of the trades working in or about the buildings and premises where Work is being performed under this Contract, or by Other Contractors or their Subcontractors pursuant to other contracts, or on any other building or premises owned or operated by the City, its Agencies, departments, boards or authorities. Any violation by the Contractor of this requirement may, upon certification of the Commissioner, be considered as proper and sufficient cause for declaring the Contractor to be in default, and for the City to take action against it as set forth in Chapter X of this Contract, or such other article of this Contract as the Commissioner may deem proper; or

35.1.3 In accordance with Section 220.3-e of the Labor Law of the State of New York (hereinafter "Labor Law"), the Contractor and its Subcontractors shall not employ on the Work any apprentice, unless he/she is a registered individual, under a bona fide program

registered with the New York State Department of Labor. The allowable ratio of apprentices to journey-level workers in any craft classification shall not be greater than the ratio permitted to the **Contractor** as to its work force on any job under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered as above, shall be paid the wage rate determined by the **Comptroller** of the **City** for the classification of **Work** actually performed. The **Contractor** or **Subcontractor** will be required to furnish written evidence of the registration of its program and apprentices as well as all the appropriate ratios and wage rates, for the area of the construction prior to using any apprentices on the **Contract Work**.

35.2 If the total cost of the **Work** under this **Contract** is at least two hundred fifty thousand (\$250,000) dollars, all laborers, workers, and mechanics employed in the performance of the **Contract** on the public work site, either by the **Contractor**, **Subcontractor** or other person doing or contracting to do the whole or a part of the **Work** contemplated by the **Contract**, shall be certified prior to performing any **Work** as having successfully completed a course in construction safety and health approved by the United States Department of Labor's Occupational Safety and Health Administration that is at least ten (10) hours in duration.

35.3 In accordance with Local Law Nos. 30-2012 and 33-2012, codified at sections 6-132 and 12-113 of the Administrative Code, respectively,

35.3.1 The **Contractor** shall not take an adverse personnel action with respect to an officer or employee in retaliation for such officer or employee making a report of information concerning conduct which such officer or employee knows or reasonably believes to involve corruption, criminal activity, conflict of interest, gross mismanagement or abuse of authority by any officer or employee relating to this **Contract** to (a) the Commissioner of the Department of Investigation, (b) a member of the New York City Council, the Public Advocate, or the **Comptroller**, or (c) the CCPO, ACCO, Agency head, or **Commissioner**.

35.3.2 If any of the **Contractor's** officers or employees believes that he or she has been the subject of an adverse personnel action in violation of Article 35.3.1, he or she shall be entitled to bring a cause of action against the **Contractor** to recover all relief necessary to make him or her whole. Such relief may include but is not limited to: (a) an injunction to restrain continued retaliation, (b) reinstatement to the position such employee would have had but for the retaliation or to an equivalent position, (c) reinstatement of full fringe benefits and seniority rights, (d) payment of two times back pay, plus interest, and (e) compensation for any special damages sustained as a result of the retaliation, including litigation costs and reasonable attorney's fees.

35.3.3 The **Contractor** shall post a notice provided by the **City** in a prominent and accessible place on any site where work pursuant to the **Contract** is performed that contains information about:

35.3.3(a) how its employees can report to the New York City Department of Investigation allegations of fraud, false claims, criminality or corruption arising out of or in connection with the **Contract**; and

35.3.3(b) the rights and remedies afforded to its employees under Administrative Code sections 7-805 (the New York City False Claims Act) and 12-113 (the Whistleblower Protection Expansion Act) for lawful acts taken in connection with the reporting of allegations of fraud, false claims, criminality or corruption in connection with the **Contract**.

35.3.4 For the purposes of this Article 35.3, "adverse personnel action" includes dismissal, demotion, suspension, disciplinary action, negative performance evaluation, any action resulting in loss of staff, office space, equipment or other benefit, failure to appoint, failure to promote, or any transfer or assignment or failure to transfer or assign against the wishes of the affected officer or employee.

35.3.5 This Article 35.3 is applicable to all of the Contractor's Subcontractors having subcontracts with a value in excess of \$100,000; accordingly, the Contractor shall include this rider in all subcontracts with a value a value in excess of \$100,000.

35.4 Article 35.3 is not applicable to this Contract if it is valued at \$100,000 or less. Articles 35.3.1, 35.3.2, 35.3.4, and 35.3.5 are not applicable to this Contract if it was solicited pursuant to a finding of an emergency.

### ARTICLE 36. NO DISCRIMINATION

36.1 The Contractor specifically agrees, as required by Labor Law Section 220-e, as amended, that:

36.1.1 In the hiring of employees for the performance of Work under this Contract or any subcontract hereunder, neither the Contractor, Subcontractor, nor any person acting on behalf of such Contractor or Subcontractor, shall by reason of race, creed, color or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the Work to which the employment relates;

36.1.2 Neither the Contractor, Subcontractor, nor any person on its behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of Work under this Contract on account of race, creed, color or national origin;

36.1.3 There may be deducted from the amount payable to the Contractor by the City under this Contract a penalty of fifty (\$50.00) dollars for each person for each Day during which such person was discriminated against or intimidated in violation of the provisions of this Contract; and

36.1.4 This Contract may be cancelled or terminated by the City and all moneys due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this Article 36.

36.1.5 This Article 36 covers all construction, alteration and repair of any public building or public work occurring in the State of New York and the manufacture, sale, and distribution of materials, equipment, and supplies to the extent that such operations are performed within the State of New York pursuant to this Contract.

36.2 The Contractor specifically agrees, as required by Section 6-108 of the Administrative Code, as amended, that:

36.2.1 It shall be unlawful for any person engaged in the construction, alteration or repair of buildings or engaged in the construction or repair of streets or highways pursuant to a Contract with the City or engaged in the manufacture, sale or distribution of materials, equipment or supplies pursuant to a Contract with the City to refuse to employ or to refuse to continue in any employment any person on account of the race, color or creed of such person.

36.2.2 It shall be unlawful for any person or any servant, agent or employee of any person, described in Article 36.1.2, to ask, indicate or transmit, orally or in writing, directly or indirectly, the race, color or creed or religious affiliation of any person employed or seeking employment from such person, firm or corporation.

36.2.3 Breach of the foregoing provisions shall be deemed a violation of a material provision of this **Contract**.

36.2.4 Any person, or the employee, manager or owner of or officer of such firm or corporation who shall violate any of the provisions of this Article 36.2 shall, upon conviction thereof, be punished by a fine of not more than one hundred (\$100.00) dollars or by imprisonment for not more than thirty (30) **Days**, or both.

36.3 This **Contract** is subject to the requirements of Executive Order No. 50 (1980) ("E.O. 50"), as revised, and the rules and regulations promulgated thereunder. No contract will be awarded unless and until these requirements have been complied with in their entirety. By signing this **Contract**, the **Contractor** agrees that it:

36.3.1 Will not engage in any unlawful discrimination against any employee or applicant for employment because of race, creed, color, national origin, sex, age, disability, marital status or sexual orientation with respect to all employment decisions including, but not limited to, recruitment, hiring, upgrading, demotion, downgrading, transfer, training, rates of pay or other forms of compensation, layoff, termination, and all other terms and conditions of employment; and

36.3.2 Will not engage in any unlawful discrimination in the selection of **Subcontractors** on the basis of the owner's race, color, creed, national origin, sex, age, disability, marital status or sexual orientation; and

36.3.3 Will state in all solicitations or advertisements for employees placed by or on behalf of the **Contractor** that all qualified applicants will receive consideration for employment without unlawful discrimination based on race, creed, color, national origin, sex, age, citizens status, disability, marital status, sexual orientation, or that it is an equal employment opportunity employer; and

36.3.4 Will send to each labor organization or representative of workers with which it has a collective bargaining agreement or other contract or memorandum of understanding, written notification of its equal employment opportunity commitments under E.O. 50 and the rules and regulations promulgated thereunder; and

36.3.5 Will furnish, before the award of the **Contract**, all information and reports, including an employment report, that are required by E.O. 50, the rules and regulations promulgated thereunder, and orders of the **City Department of Business Services, Division of Labor Services (DLS)** and will permit access to its books, records, and accounts by the **DLS** for the purposes of investigation to ascertain compliance with such rules, regulations, and orders.

36.4 The **Contractor** understands that in the event of its noncompliance with the nondiscrimination clauses of this **Contract** or with any of such rules, regulations, or orders, such noncompliance shall constitute a material breach of this **Contract** and noncompliance with E.O. 50 and the rules and regulations promulgated thereunder. After a hearing held pursuant to the rules of the **DLS**, the Director of the **DLS** may direct the **Commissioner** to impose any or all of the following sanctions:



36.4.1 Disapproval of the Contractor; and/or

36.4.2 Suspension or termination of the Contract; and/or

36.4.3 Declaring the Contractor in default; and/or

36.4.4 In lieu of any of the foregoing sanctions, the Director of the DLS may impose an employment program.

In addition to any actions taken under this Contract, failure to comply with E.O. 50 and the rules and regulations promulgated thereunder, in one or more instances, may result in a City Agency declaring the Contractor to be non-responsible in future procurements. The Contractor further agrees that it will refrain from entering into any Contract or Contract modification subject to E.O. 50 and the rules and regulations promulgated thereunder with a Subcontractor who is not in compliance with the requirements of E.O. 50 and the rules and regulations promulgated thereunder.

36.5 The Contractor specifically agrees, as required by Section 6-123 of the Administrative Code, that:

36.5.1 The Contractor will not engage in any unlawful discriminatory practice in violation of Title 8 of the Administrative Code; and

36.5.2 Any failure to comply with this Article 36.5 may subject the Contractor to the remedies set forth in Section 6-123 of the Administrative Code, including, where appropriate, sanctions such as withholding of payment, imposition of an employment program, finding the Contractor to be in default, cancellation of the Contract, or any other sanction or remedy provided by Law or Contract.

### ARTICLE 37. LABOR LAW REQUIREMENTS

37.1 The Contractor shall strictly comply with all applicable provisions of the Labor Law, as amended. Such compliance is a material term of this Contract.

37.2 The Contractor specifically agrees, as required by Labor Law Sections 220 and 220-d, as amended, that:

37.2.1 **Hours of Work:** No laborer, worker, or mechanic in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or a part of the Work contemplated by this Contract shall be permitted or required to work more than eight (8) hours in any one (1) Day, or more than five (5) Days in any one (1) week, except as provided in the Labor Law and in cases of extraordinary emergency including fire, flood, or danger to life or property, or in the case of national emergency when so proclaimed by the President of the United States of America.

37.2.2 In situations in which there are not sufficient laborers, workers, and mechanics who may be employed to carry on expeditiously the Work contemplated by this Contract as a result of such restrictions upon the number of hours and Days of labor, and the immediate commencement or prosecution or completion without undue delay of the Work is necessary for the preservation of the Site and/or for the protection of the life and limb of the persons using the same, such laborers, workers, and mechanics shall be permitted or required to

work more than eight (8) hours in any one (1) Day; or five (5) Days in any one (1) week; provided, however, that upon application of any Contractor, the Commissioner shall have first certified to the Commissioner of Labor of the State of New York (hereinafter "Commissioner of Labor") that such public Work is of an important nature and that a delay in carrying it to completion would result in serious disadvantage to the public; and provided, further, that such Commissioner of Labor shall have determined that such an emergency does in fact exist as provided in Labor Law Section 220.2.

37.2.3 Failure of the Commissioner to make such a certification to the Commissioner of Labor shall not entitle the Contractor to damages for delay or for any cause whatsoever.

37.2.4 Prevailing Rate of Wages: The wages to be paid for a legal day's Work to laborers, workers, or mechanics employed upon the Work contemplated by this Contract or upon any materials to be used thereon shall not be less than the "prevailing rate of wage" as defined in Labor Law Section 220, and as fixed by the Comptroller in the attached Schedule of Wage Rates and in updated schedules thereof. The prevailing wage rates and supplemental benefits to be paid are those in effect at the time the Work is being performed.

37.2.5 Requests for interpretation or correction in the Information for Bidders includes all requests for clarification of the classification of trades to be employed in the performance of the Work under this Contract. In the event that a trade not listed in the Contract is in fact employed during the performance of this Contract, the Contractor shall be required to obtain from the Agency the prevailing wage rates and supplementary benefits for the trades used and to complete the performance of this Contract at the price at which the Contract was awarded.

37.2.6 Minimum Wages: Except for employees whose wage is required to be fixed pursuant to Labor Law Section 220, all persons employed by the Contractor and any Subcontractor in the manufacture or furnishing of the supplies, materials, or equipment, or the furnishing of work, labor, or services, used in the performance of this Contract, shall be paid, without subsequent deduction or rebate unless expressly authorized by Law, not less than the sum mandated by Law.

37.3 Working Conditions: No part of the Work, labor or services shall be performed or rendered by the Contractor in any plants, factories, buildings or surroundings or under working conditions which are unsanitary or hazardous or dangerous to the health and safety of employees engaged in the performance of this Contract. Compliance with the safety, sanitary, and factory inspection Laws of the state in which the Work is to be performed shall be prima facie evidence of compliance with this Article 37.3.

37.4 Prevailing Wage Enforcement: The Contractor agrees to pay for all costs incurred by the City in enforcing prevailing wage requirements, including the cost of any investigation conducted by or on behalf of the Agency or the Comptroller, where the City discovers a failure to comply with any of the requirements of this Article 37 by the Contractor or its Subcontractor(s). The Contractor also agrees that, should it fail or refuse to pay for any such investigation, the Agency is hereby authorized to deduct from a Contractor's account an amount equal to the cost of such investigation.

37.4.1 The Labor Law Section 220 and Section 220-d, as amended, provide that this Contract shall be forfeited and no sum paid for any Work done hereunder on a second conviction for willfully paying less than:

37.4.1(a) The stipulated prevailing wage scale as provided in Labor Law section 220, as amended, or

37.4.1(b) The stipulated minimum hourly wage scale as provided in Labor Law section 220-d, as amended.

37.4.2 For any breach or violation of either working conditions (Article 37.3) or minimum wages (Article 37.2.6) provisions, the party responsible therefor shall be liable to the City for liquidated damages, which may be withheld from any amounts due on any contracts with the City of such party responsible, or may be recovered in actions brought by the City Corporation Counsel in the name of the City, in addition to damages for any other breach of this Contract, for a sum equal to the amount of any underpayment of wages due to any employee engaged in the performance of this Contract. In addition, the Commissioner shall have the right to cancel contracts and enter into other contracts for the completion of the original contract, with or without public letting, and the original Contractor shall be liable for any additional cost. All sums withheld or recovered as deductions, rebates, refunds, or underpayment of wages hereunder, shall be held in a special deposit account and shall be paid without interest, on order of the Comptroller, directly to the employees who have been paid less than minimum rates of pay as set forth herein and on whose account such sums were withheld or recovered, provided that no claims by employees for such payments shall be entertained unless made within two (2) years from the date of actual notice to the Contractor of the withholding or recovery of such sums by the City.

37.4.3 A determination by the Comptroller that a Contractor and/or its Subcontractor willfully violated Labor Law Section 220 will be forwarded to the City's five District Attorneys for review.

37.4.4 The Contractor's or Subcontractor's noncompliance with this Article 37.4 and Labor Law Section 220 may result in an unsatisfactory performance evaluation and the Comptroller may also find and determine that the Contractor or Subcontractor willfully violated the New York Labor Law.

37.4.4(a) An unsatisfactory performance evaluation for noncompliance with this Article 37.4 may result in a determination that the Contractor is a non-responsible bidder on subsequent procurements with the City and thus a rejection of a future award of a contract with the City, as well as any other sanctions provided for by Law.

37.4.4(b) Labor Law Section 220-b, as amended, provides that when two (2) final determinations have been rendered against a Contractor or Subcontractor within any consecutive six (6) year period determining that such Contractor or Subcontractor has willfully failed to pay the prevailing rate of wages or to provide supplements in accordance with the Labor Law and this Article 37.4, whether such failures were concurrent or consecutive and whether or not such final determinations concerning separate public works projects are rendered simultaneously, such Contractor or Subcontractor shall be ineligible to submit a bid on or be awarded any public works contract with the City for a period of five (5) years from the second final determination. If the final determination involves the falsification of payroll records or the kickback of wages or supplements, the Contractor or Subcontractor shall be ineligible to submit a bid on or be awarded any public works contract with the City for a period of five (5) years from the first final determination.

37.4.4(c) Labor Law Section 220, as amended, provides that the Contractor or Subcontractor found to have violated this Article 37.4 may be directed to make payment of wages or supplements including interest found to be due, and the Contractor or Subcontractor may be directed to make payment of a further sum as

a civil penalty in an amount not exceeding twenty-five (25%) percent of the total amount found to be due.

37.5 The Contractor and its Subcontractors shall within ten (10) Days after mailing of a Notice of Award or written order, post in prominent and conspicuous places in each and every plant, factory, building, and structure where employees of the Contractor and its Subcontractors engaged in the performance of this Contract are employed, notices furnished by the City, in relation to prevailing wages and supplements, minimum wages, and other stipulations contained in Sections 220 and 220-h of the Labor Law, and the Contractor and its Subcontractors shall continue to keep such notices posted in such prominent and conspicuous places until Final Acceptance of the supplies, materials, equipment, or Work, labor, or services required to be furnished or rendered under this Contract.

37.6 The Contractor shall strictly comply with all of the provisions of Articles 37.6.1 through 37.6.5, and provide for all workers, laborers or mechanics in its employ, the following:

37.6.1 Notices Posted At Site: Post, in a location designated by the City, schedules of prevailing wages and supplements for this Project, a copy of all re-determinations of such schedules for the Project, the Workers' Compensation Law Section 51 notice, all other notices required by Law to be posted at the Site, the City notice that this Project is a public works project on which each worker is entitled to receive the prevailing wages and supplements for the occupation at which he or she is working, and all other notices which the City directs the Contractor to post. The Contractor shall provide a surface for such notices which is satisfactory to the City. The Contractor shall maintain and keep current such notices in a legible manner and shall replace any notice or schedule which is damaged, defaced, illegible or removed for any reason. The Contractor shall post such notices before commencing any Work on the Site and shall maintain such notices until all Work on the Site is complete; and

37.6.2 Daily Site Sign-in Sheets: Maintain daily Site sign-in sheets, and require that Subcontractors maintain daily Site sign-in sheets for its employees, which include blank spaces for an employee's name to be both printed and signed, job title, date started and Social Security number, the time the employee began work and the time the employee left work, until Final Acceptance of the supplies, materials, equipment, or Work, labor, or services to be furnished or rendered under this Contract unless exception is granted by the Comptroller upon application by the Agency. In the alternative, subject to the approval of the CCPO, the Contractor and Subcontractor may maintain an electronic or biometric sign-in system, which provides the information required by this Article 37.6.2; and

37.6.3 Individual Employee Information Notices: Distribute a notice to each worker, laborer or mechanic employed under this Contract, in a form provided by the Agency, that this Project is a public works project on which each worker, laborer or mechanic is entitled to receive the prevailing rate of wages and supplements for the occupation at which he or she is working. If the total cost of the Work under this Contract is at least two hundred fifty thousand (\$250,000) dollars, such notice shall also include a statement that each worker, laborer or mechanic must be certified prior to performing any Work as having successfully completed a course in construction safety and health approved by the United States Department of Labor's Occupational Safety and Health Administration that is at least ten (10) hours in duration. Such notice shall be distributed to each worker before he or she starts performing any Work of this Contract and with the first paycheck after July first of each year. "Worker, laborer or mechanic" includes employees of the Contractor and all Subcontractors and all employees of suppliers entering the Site. At the time of distribution, the Contractor shall have each worker, laborer or mechanic sign a statement, in a form provided by the Agency, certifying that the worker has received the notice required by this

Article 37.6.3, which signed statement shall be maintained with the payroll records required by this Contract; and

37.6.3(a) The Contractor and each Subcontractor shall notify each worker, laborer or mechanic employed under this Contract in writing of the prevailing rate of wages for their particular job classification. Such notification shall be given to every worker, laborer, and mechanic on their first pay stub and with every pay stub thereafter; and

37.6.4 Site Laminated Identification Badges: The Contractor shall provide laminated identification badges which include a photograph of the worker's, laborer's or mechanic's face and indicate the worker's, laborer's or mechanic's name, trade, employer's name, and employment starting date (month/day/year). Further, the Contractor shall require as a condition of employment on the Site, that each and every worker, laborer or mechanic wear the laminated identification badge at all times and that it may be seen by any representative of the City. The Commissioner may grant a written waiver from the requirement that the laminated identification badge include a photograph if the Contractor demonstrates that the identity of an individual wearing a laminated identification badge can be easily verified by another method; and

37.6.5 Language Other Than English Used On Site: Provide the ACCO notice when three (3) or more employees (worker and/or laborer and/or mechanic) on the Site, at any time, speak a language other than English. The ACCO will then provide the Contractor the notices described in Article 37.6.1 in that language or languages as may be required. The Contractor is responsible for all distributions under this Article 37; and

37.6.6 Provision of Records: The Contractor and Subcontractor(s) shall produce within five (5) Days on the Site of the Work and upon a written order of the Engineer, the Commissioner, the ACCO, the Agency EAO, or the Comptroller, such records as are required to be kept by this Article 37.6; and

37.6.7 The Contractor and Subcontractor(s) shall pay employees by check or direct deposit. If this Contract is for an amount greater than one million (\$1,000,000) dollars, checks issued by the Contractor to covered employees shall be generated by a payroll service or automated payroll system (an in-house system may be used if approved by the Agency). For any subcontract for an amount greater than seven hundred fifty thousand (\$750,000) dollars, checks issued by a Subcontractor to covered employees shall be generated by a payroll service or automated payroll system (an in-house system may be used if approved by the Agency); and

37.6.8 The failure of the Contractor or Subcontractor(s) to comply with the provisions of Articles 37.6.1 through 37.6.7 may result in the Commissioner declaring the Contractor in default and/or the withholding of payments otherwise due under the Contract.

37.7 The Contractor and its Subcontractors shall keep such employment and payroll records as are required by Section 220 of the Labor Law. The failure of the Contractor or Subcontractor(s) to comply with the provisions of this Article 37.7 may result in the Commissioner declaring the Contractor in default and/or the withholding of payments otherwise due under the Contract.

37.8 At the time the Contractor makes application for each partial payment and for final payment, the Contractor shall submit to the Commissioner a written payroll certification, in the form provided by this Contract, of compliance with the prevailing wage, minimum wage, and other provisions and stipulations required by Labor Law Section 220 and of compliance with the training requirements of

Labor Law Section 220-h set forth in Article 35.2. This certification of compliance shall be a condition precedent to payment and no payment shall be made to the **Contractor** unless and until each such certification shall have been submitted to and received by the **Commissioner**.

37.9 This **Contract** is executed by the **Contractor** with the express warranty and representation that the **Contractor** is not disqualified under the provisions of Section 220 of the Labor Law from the award of the **Contract**.

37.10 Any breach or violation of any of the foregoing shall be deemed a breach or violation of a material provision of this **Contract**, and grounds for cancellation thereof by the **City**.

### ARTICLE 38. PAYROLL REPORTS

38.1 The **Contractor** and its **Subcontractor(s)** shall maintain on the **Site** during the performance of the **Work** the original payrolls or transcripts thereof which the **Contractor** and its **Subcontractor(s)** are required to maintain and shall submit such original payrolls or transcripts, subscribed and affirmed by it as true, within thirty (30) **Days** after issuance of its first payroll, and every thirty (30) **Days** thereafter, pursuant to Labor Law Section 220(3-a)(a)(iii). The **Contractor** and **Subcontractor(s)** shall submit such original payrolls or transcripts along with each and every payment requisition. If payment requisitions are not submitted at least once a month, the **Contractor** and its **Subcontractor(s)** shall submit original payrolls and transcripts both along with its payment requisitions and independently of its payment requisitions.

38.2 The **Contractor** shall maintain payrolls or transcripts thereof for six (6) years from the date of completion of the **Work** on this **Contract**. If such payrolls and transcripts are maintained outside of New York City after the completion of the **Work** and their production is required pursuant to this Article 38, the **Contractor** shall produce such records in New York City upon request by the **City**.

38.3 The **Contractor** and **Subcontractor(s)** shall comply with any written order, direction, or request made by the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, the **Agency Labor Law Investigator(s)**, or the **Comptroller**, to provide to the requesting party any of the following information and/or records within five (5) **Days** of such written order, direction, or request:

38.3.1 Such original payrolls or transcripts thereof subscribed and affirmed by it as true and the statements signed by each worker pursuant to this Chapter VIII; and/or

38.3.2 Attendance sheets for each **Day** on which any employee of the **Contractor** and/or any of the **Subcontractor(s)** performed **Work** on the **Site**, which attendance sheet shall be in a form acceptable to the **Agency** and shall provide information acceptable to the **Agency** to identify each such employee; and/or

38.3.3 Any other information to satisfy the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, the **Agency Labor Law Investigator(s)** or the **Comptroller**, that this Chapter VIII and the Labor Law, as to the hours of employment and prevailing rates of wages and/or supplemental benefits, are being observed.

38.4 The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of Articles 38.1 and/or 38.2 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract**.

### ARTICLE 39. DUST HAZARDS

39.1 Should a harmful dust hazard be created in performing the **Work** of this **Contract**, for the elimination of which appliances or methods have been approved by the Board of Standards and Appeals of the City of New York, such appliances and methods shall be installed, maintained, and effectively operated during the continuance of such harmful dust hazard. Failure to comply with this provision after notice shall make this **Contract** voidable at the sole discretion of the **City**.

### CHAPTER IX PARTIAL AND FINAL PAYMENTS

### ARTICLE 40. CONTRACT PRICE

40.1 The **City** shall pay, and the **Contractor** agrees to accept, in full consideration for the **Contractor's** performance of the **Work** subject to the terms and conditions hereof, the lump sum price or unit prices for which this **Contract** was awarded, plus the amount required to be paid for any **Extra Work** ordered by the **Commissioner** under Article 25, less credit for any **Work** omitted pursuant to Article 29.

### ARTICLE 41. BID BREAKDOWN ON LUMP SUM

41.1 Within fifteen (15) **Days** after the commencement date specified in the **Notice to Proceed** or **Order to Work**, unless otherwise directed by the **Resident Engineer**, the **Contractor** shall submit to the **Resident Engineer** a breakdown of its bid price, or of lump sums bid for items of the **Contract**, showing the various operations to be performed under the **Contract**, as directed in the progress schedule required under Article 9, and the value of each of such operations, the total of such items to equal the lump sum price bid. Said breakdown must be approved in writing by the **Resident Engineer**.

41.2 No partial payment will be approved until the **Contractor** submits a bid breakdown that is acceptable to the **Resident Engineer**.

41.3 The **Contractor** shall also submit such other information relating to the bid breakdown as directed by the **Resident Engineer**. Thereafter, the breakdown may be used only for checking the **Contractor's** applications for partial payments hereunder, but shall not be binding upon the **City**, the **Commissioner**, or the **Engineer** for any purpose whatsoever.

### ARTICLE 42. PARTIAL PAYMENTS

42.1 From time to time as the **Work** progresses satisfactorily, but not more often than once each calendar month (except where the **Commissioner** approves in writing the submission of invoices on a more frequent basis and for invoices relating to **Work** performed pursuant to a change order), the **Contractor** may submit to the **Engineer** a requisition for a partial payment in the prescribed form, which shall contain an estimate of the quantity and the fair value of the **Work** done during the payment period.

42.2 Partial payments may be made for materials, fixtures, and equipment in advance of their actual incorporation in the **Work**, as the **Commissioner** may approve, and upon the terms and conditions set forth in the **General Conditions**.

42.3 The Contractor shall also submit to the Commissioner in connection with every application for partial payment a verified statement in the form prescribed by the Comptroller setting forth the information required under Labor Law Section 220-a.

42.4 Within thirty (30) Days after receipt of a satisfactory payment application, and within sixty (60) Days after receipt of a satisfactory payment application in relation to Work performed pursuant to a change order, the Engineer will prepare and certify, and the Commissioner will approve, a voucher for a partial payment in the amount of such approved estimate, less any and all deductions authorized to be made by the Commissioner under the terms of this Contract or by Law.

#### ARTICLE 43. PROMPT PAYMENT

43.1 The Prompt Payment provisions of the PPB Rules in effect at the time of the bid will be applicable to payments made under this Contract. The provisions require the payment to the Contractor of interest on payments made after the required payment date, except as set forth in the PPB Rules.

43.2 The Contractor shall submit a proper invoice to receive payment, except where the Contract provides that the Contractor will be paid at predetermined intervals without having to submit an invoice for each scheduled payment.

43.3 Determination of interest due will be made in accordance with the PPB Rules.

43.4 If the Contractor is paid interest, the proportionate share(s) of that interest shall be forwarded by the Contractor to its Subcontractor(s).

43.5 The Contractor shall pay each Subcontractor or Materialman not later than seven (7) Days after receipt of payment out of amounts paid to the Contractor by the City for Work performed by the Subcontractor or Materialman under this Contract.

43.5.1 If Contractor fails to make any payment to any Subcontractor or Materialman within seven (7) Days after receipt of payment by the City pursuant to this Article 43.5, then the Contractor shall pay interest on amounts due to such Subcontractor or Materialman at the rate of interest in effect on the date such payment is made by the Contractor computed in accordance with Section 756-b (1)(b) of the New York General Business Law. Accrual of interest shall commence on the Day immediately following the expiration of the seventh Day following receipt of payment by the Contractor from the City and shall end on the date on which payment is made.

43.6 The Contractor shall include in each of its subcontracts a provision requiring each Subcontractor to make payment to each of its Subcontractors or Materialmen for Work performed under this Contract in the same manner and within the same time period set forth above.

#### ARTICLE 44. SUBSTANTIAL COMPLETION PAYMENT

44.1 The Contractor shall submit with the Substantial Completion requisition:

44.1.1 A final verified statement of any pending Article 27 disputes in accordance with the PPB Rules and this Contract and any and all alleged claims against the City, in any way connected with or arising out of this Contract (including those as to which details may have been furnished pursuant to Articles 11, 27, 28, and 30) setting forth with respect to each



such claim the total amount thereof, the various items of labor and materials included therein, and the alleged value of each item; and if the alleged claim be one for delay, the alleged cause of each such delay, the period or periods of time, giving the dates when the Contractor claims the performance of the Work or a particular part thereof was delayed, and an itemized statement and breakdown of the amount claimed for each such delay.

44.1.1(a) With respect to each such claim, the Commissioner, the Comptroller and, in the event of litigation, the City Corporation Counsel shall have the same right to inspect, and to make extracts or copies of, the Contractor's books, vouchers, records, etc., as is referred to in Articles 11, 27, 28, and 30. Nothing contained in this Article 44.1.1(a) is intended to or shall relieve the Contractor from the obligation of complying strictly with Articles 11, 27, 28, and 30. The Contractor is warned that unless such claims are completely set forth as herein required, the Contractor upon acceptance of the Substantial Completion payment pursuant to this Article 44, will have waived any such claims.

44.1.2 A Final Approved Punch List.

44.1.3 Where required, a request for an extension of time to achieve Substantial Completion or final extension of time.

44.2 The Commissioner shall issue a voucher calling for payment of any part or all of the balance due for Work performed under the Contract, including monies retained under Article 21, less any and all deductions authorized to be made by the Commissioner, under this Contract or by Law, and less twice the amount the Commissioner considers necessary to ensure the completion of the balance of the Work by the Contractor. Such a payment shall be considered a partial and not a final payment. No Substantial Completion payment shall be made under this Article 44 where the Contractor failed to complete the Work within the time fixed for such completion in the Schedule A of the General Conditions, or within the time to which completion may have been extended, until an extension or extensions of time for the completion of Work have been acted upon pursuant to Article 13.

44.3 No further partial payments shall be made to the Contractor after Substantial Completion, except the Substantial Completion payment and payment pursuant to any Contractor's requisition that were properly filed with the Commissioner prior to the date of Substantial Completion; however, the Commissioner may grant a waiver for further partial payments after the date of Substantial Completion to permit payments for change order Work and/or release of retainage and deposits pursuant to Articles 21 and 24. Such waiver shall be in writing.

44.4 The Contractor acknowledges that nothing contained in this Article 44 is intended to or shall in any way diminish the force and effect of Article 13.

#### ARTICLE 45. FINAL PAYMENT

45.1 After completion and Final Acceptance of the Work, the Contractor shall submit all required certificates and documents, together with a requisition for the balance claimed to be due under the Contract, less the amount authorized to be retained for maintenance under Article 24. Such submission shall be within 90 days of the date of the Commissioner's written determination of Final Acceptance, or within such additional time as may be granted by the Commissioner in writing. If the Contractor fails to submit all required certificates and documents within the time allowed, no payment of the balance claimed shall be made to the Contractor and the Contractor shall be deemed to have forfeited its right to

payment of any balance claimed. A verified statement similar to that required in connection with applications for partial payments shall also be submitted to the **Commissioner**.

45.2 Amended Verified Statement of Claims: The **Contractor** shall also submit with the final requisition any amendments to the final verified statement of any pending dispute resolution procedures in accordance with the **PPB Rules** and this **Contract** and any and all alleged claims against the **City**, in any way connected with or arising out of this **Contract** (including those as to which details may have been furnished pursuant to Articles 11, 27, 28, and 30) that have occurred subsequent to **Substantial Completion**, setting forth with respect to each such claim the total amount thereof, the various items of labor and materials included therein, and the alleged value of each such item; and if the alleged claim be one for delay, the alleged cause of each such delay, the period or periods of time, giving the dates when the **Contractor** claims the performance of the **Work** or a particular part thereof was delayed, and an itemized statement and breakdown of the amount claimed for each such delay. With reference to each such claim, the **Commissioner**, the **Comptroller** and, in the event of litigation, the **City Corporation Counsel** shall have the same right to inspect, and to make extracts or copies of, the **Contractor's** books, vouchers, records, etc., as is referred to in Articles 11, 27, 28, and 30. Nothing contained in this Article 45.2, is intended to or shall relieve the **Contractor** from the obligation of complying strictly with Articles 11, 27, 28, and 30. The **Contractor** is warned that unless such claims are completely set forth as herein required, the **Contractor**, upon acceptance of the Final Payment pursuant to Article 46, will have waived any such claims.

45.3 Preparation of Final Voucher: Upon determining the balance due hereunder other than on account of claims, the **Engineer** will prepare and certify, for the **Commissioner's** approval, a voucher for final payment in that amount less any and all deductions authorized to be made by the **Commissioner** under this **Contract** or by **Law**. In the case of a lump sum **Contract**, the **Commissioner** shall certify the voucher for final payment within thirty (30) **Days** from the date of completion and acceptance of the **Work**, provided all requests for extensions of time have been acted upon.

45.3.1 All prior certificates and vouchers upon which partial payments were made, being merely estimates made to enable the **Contractor** to prosecute the **Work** more advantageously, shall be subject to correction in the final voucher, and the certification of the **Engineer** thereon and the approval of the **Commissioner** thereof, shall be conditions precedent to the right of the **Contractor** to receive any money hereunder. Such final voucher shall be binding and conclusive upon the **Contractor**.

45.3.2 Payment pursuant to such final voucher, less any deductions authorized to be made by the **Commissioner** under this **Contract** or by **Law**, shall constitute the final payment, and shall be made by the **Comptroller** within thirty (30) **Days** after the filing of such voucher in his/her office.

45.4 The **Contractor** acknowledges that nothing contained in this Article 45 is intended to or shall in any way diminish the force and effect of Article 13.

#### ARTICLE 46. ACCEPTANCE OF FINAL PAYMENT

46.1 The acceptance by the **Contractor**, or by anyone claiming by or through it, of the final payment, whether such payment be made pursuant to any judgment of any court, or otherwise, shall constitute and operate as a release of the **City** from any and all claims of and liability to the **Contractor** for anything heretofore done or furnished for the **Contractor** relating to or arising out of this **Contract** and the **Work** done hereunder, and for any prior act, neglect or default on the part of the **City** or any of its officials, agents or employees, excepting only a claim against the **City** for the amounts deducted or retained in accordance with the terms and provisions of this **Contract** or by **Law**, and excepting any

claims, not otherwise waived, or any pending dispute resolution procedures which are contained in the verified statement filed with the Contractor's substantial and final requisitions pursuant to Articles 44 and 45.

46.2 The Contractor is warned that the execution by it of a release, in connection with the acceptance of the final payment, containing language purporting to reserve claims other than those herein specifically excepted from the operation of this Article 46, or those for amounts deducted by the Commissioner from the final requisition or from the final payment as certified by the Engineer and approved by the Commissioner, shall not be effective to reserve such claims, anything stated to the Contractor orally or in writing by any official, agent or employee of the City to the contrary notwithstanding.

46.3 Should the Contractor refuse to accept the final payment as tendered by the Comptroller, it shall constitute a waiver of any right to interest thereon.

46.4 The Contractor, however, shall not be barred by this Article 46 from commencing an action for breach of Contract to the extent permitted by Law and by the terms of the Contract for any claims that are contained in the verified statement filed with the Contractor's substantial and final requisitions pursuant to Articles 44 and 45 or that arose after submission of the final payment requisition, provided that a detailed and verified statement of claim is served upon the contracting Agency and Comptroller not later than forty (40) Days after the making of such final payment by electronic funds transfer (EFT) or the mailing of such final payment. The statement shall specify the items upon which the claim will be based and any such claim shall be limited to such items.

#### ARTICLE 47. APPROVAL BY PUBLIC DESIGN COMMISSION

47.1 All works of art, including paintings, mural decorations, stained glass, statues, bas-reliefs, and other sculptures, monuments, fountains, arches, and other structures of a permanent character intended for ornament or commemoration, and every design of the same to be used in the performance of this Contract, and the design of all bridges, approaches, buildings, gates, fences, lamps, or structures to be erected, pursuant to the terms of this Contract, shall be submitted to the Art Commission, d/b/a the Public Design Commission of the City of New York, and shall be approved by the Public Design Commission prior to the erection or placing in position of the same. The final payment shall not become due or payable under this Contract unless and until the Public Design Commission shall certify that the design for the Work herein contracted for has been approved by the said Public Design Commission, and that the same has been executed in substantial accordance with the design so approved, pursuant to the provisions of Chapter 37, Section 854 of the City Charter, as amended.

### CHAPTER X CONTRACTOR'S DEFAULT

#### ARTICLE 48. COMMISSIONER'S RIGHT TO DECLARE CONTRACTOR IN DEFAULT

48.1 In addition to those instances specifically referred to in other Articles herein, the Commissioner shall have the right to declare the Contractor in default of this Contract if:

48.1.1 The Contractor fails to commence Work when notified to do so by the Commissioner; or  
if

48.1.2 The Contractor shall abandon the Work; or if

48.1.3 The **Contractor** shall refuse to proceed with the **Work** when and as directed by the **Commissioner**; or if

48.1.4 The **Contractor** shall, without just cause, reduce its working force to a number which, if maintained, would be insufficient, in the opinion of the **Commissioner**, to complete the **Work** in accordance with the progress schedule; or if

48.1.5 The **Contractor** shall fail or refuse to increase sufficiently such working force when ordered to do so by the **Commissioner**; or if

48.1.6 The **Contractor** shall sublet, assign, transfer, convert or otherwise dispose of this **Contract** other than as herein specified; or sell or assign a majority interest in the **Contractor**; or if

48.1.7 The **Contractor** fails to secure and maintain all required insurance; or if

48.1.8 A receiver or receivers are appointed to take charge of the **Contractor's** property or affairs; or if

48.1.9 The **Commissioner** shall be of the opinion that the **Contractor** is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the **Work**, or the award of necessary subcontracts, or the placing of necessary material and equipment orders; or if

48.1.10 The **Commissioner** shall be of the opinion that the **Contractor** is or has been willfully or in bad faith violating any of the provisions of this **Contract**; or if

48.1.11 The **Commissioner** shall be of the opinion that the **Work** cannot be completed within the time herein provided therefor or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the **Commissioner's** opinion, attributable to conditions within the **Contractor's** control; or if

48.1.12 The **Work** is not completed within the time herein provided therefor or within the time to which the **Contractor** may be entitled to have such completion extended; or if

48.1.13 Any statement or representation of the **Contractor** in the **Contract** or in any document submitted by the **Contractor** with respect to the **Work**, the **Project**, or the **Contract** (or for purposes of securing the **Contract**) was untrue or incorrect when made; or if

48.1.14 The **Contractor** or any of its officers, directors, partners, five (5%) percent shareholders, principals, or other persons substantially involved in its activities, commits any of the acts or omissions specified as the grounds for debarment in the **PPB Rules**.

48.2 Before the **Commissioner** shall exercise his/her right to declare the **Contractor** in default, the **Commissioner** shall give the **Contractor** an opportunity to be heard, upon not less than two (2) **Days** notice.

#### ARTICLE 49. EXERCISE OF THE RIGHT TO DECLARE DEFAULT

49.1 The right to declare the **Contractor** in default for any of the grounds specified or referred to in Article 48 shall be exercised by sending the **Contractor** a notice, signed by the **Commissioner**, setting forth the ground or grounds upon which such default is declared (hereinafter referred to as a "Notice of Default").

49.2 The **Commissioner's** determination that the **Contractor** is in default shall be conclusive, final, and binding on the parties and such a finding shall preclude the **Contractor** from commencing a plenary action for any damages relating to the **Contract**. If the **Contractor** protests the determination of the **Commissioner**, the **Contractor** may commence an action in a court of competent jurisdiction of the State of New York under Article 78 of the New York Civil Practice Law and Rules.

#### ARTICLE 50. QUITTING THE SITE

50.1 Upon receipt of such notice the **Contractor** shall immediately discontinue all further operations under this **Contract** and shall immediately quit the **Site**, leaving untouched all plant, materials, equipment, tools, and supplies then on the **Site**.

#### ARTICLE 51. COMPLETION OF THE WORK

51.1 The **Commissioner**, after declaring the **Contractor** in default, may then have the **Work** completed by such means and in such manner, by contract with or without public letting, or otherwise, as he/she may deem advisable, utilizing for such purpose such of the **Contractor's** plant, materials, equipment, tools, and supplies remaining on the **Site**, and also such **Subcontractors**, as he/she may deem advisable.

51.2 After such completion, the **Commissioner** shall make a certificate stating the expense incurred in such completion, which shall include the cost of re-letting and also the total amount of liquidated damages (at the rate provided for in the **Contract**) from the date when the **Work** should have been completed by the **Contractor** in accordance with the terms hereof to the date of actual completion of the **Work**. Such certificate shall be binding and conclusive upon the **Contractor**, its sureties, and any person claiming under the **Contractor**, as to the amount thereof.

51.3 The expense of such completion, including any and all related and incidental costs, as so certified by the **Commissioner**, and any liquidated damages assessed against the **Contractor**, shall be charged against and deducted out of monies which are earned by the **Contractor** prior to the date of default. Should the expense of such completion, as certified by the **Commissioner**, exceed the total sum which would have been payable under the **Contract** if it had been completed by the **Contractor**, any excess shall be paid by the **Contractor**.

#### ARTICLE 52. PARTIAL DEFAULT

52.1 In case the **Commissioner** shall declare the **Contractor** in default as to a part of the **Work** only, the **Contractor** shall discontinue such part, shall continue performing the remainder of the **Work** in strict conformity with the terms of this **Contract**, and shall in no way hinder or interfere with any **Other**

Contractor(s) or persons whom the Commissioner may engage to complete the Work as to which the Contractor was declared in default.

52.2 The provisions of this Chapter relating to declaring the Contractor in default as to the entire Work shall be equally applicable to a declaration of partial default, except that the Commissioner shall be entitled to utilize for completion of the part of the Work as to which the Contractor was declared in default only such plant, materials, equipment, tools, and supplies as had been previously used by the Contractor on such part.

#### ARTICLE 53. PERFORMANCE OF UNCOMPLETED WORK

53.1 In completing the whole or any part of the Work under the provisions of this Chapter X, the Commissioner shall have the power to depart from or change or vary the terms and provisions of this Contract, provided, however, that such departure, change or variation is made for the purpose of reducing the time or expense of such completion. Such departure, change or variation, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the Commissioner's certificate of the cost of completion referred to in Article 51, nor shall it constitute a defense to an action to recover the amount by which such certificate exceeds the amount which would have been payable to the Contractor hereunder but for its default.

#### ARTICLE 54. OTHER REMEDIES

54.1 In addition to the right to declare the Contractor in default pursuant to this Chapter X, the Commissioner shall have the absolute right, in his/her sole discretion and without a hearing, to complete or cause to be completed in the same manner as described in Articles 51 and 53, any or all unsatisfactory or uncompleted punch list Work that remains after the completion date specified in the Final Approved Punch List. A written notice of the exercise of this right shall be sent to the Contractor who shall immediately quit the Site in accordance with the provisions of Article 50.

54.2 The expense of completion permitted under Article 54.1, including any and all related and incidental costs, as so certified by the Commissioner, shall be charged against and deducted out of monies which have been earned by the Contractor prior to the date of the exercise of the right set forth in Article 54.1; the balance of such monies, if any, subject to the other provisions of this Contract, to be paid to the Contractor without interest after such completion. Should the expense of such completion, as certified by the Commissioner, exceed the total sum which would have been payable under the Contract if it had been completed by the Contractor, any excess shall be paid by the Contractor.

54.3 The previous provisions of this Chapter X shall be in addition to any and all other remedies available under Law or in equity.

54.4 The exercise by the City of any remedy set forth herein shall not be deemed a waiver by the City of any other legal or equitable remedy contained in this Contract or provided under Law.

CHAPTER XI  
MISCELLANEOUS PROVISIONS

ARTICLE 55. CONTRACTOR'S WARRANTIES

55.1 In consideration of, and to induce, the award of this **Contract** to the **Contractor**, the **Contractor** represents and warrants:

55.1.1 That it is financially solvent, sufficiently experienced and competent to perform the **Work**; and

55.1.2 That the facts stated in its bid and the information given by it pursuant to the **Information for Bidders** is true and correct in all respects; and

55.1.3 That it has read and complied with all requirements set forth in the **Contract**.

ARTICLE 56. CLAIMS AND ACTIONS THEREON

56.1 Any claim, that is not subject to dispute resolution under the **PPB Rules** or this **Contract**, against the **City** for damages for breach of **Contract** shall not be made or asserted in any action, unless the **Contractor** shall have strictly complied with all requirements relating to the giving of notice and of information with respect to such claims, as herein before provided.

56.2 Nor shall any action be instituted or maintained on any such claims unless such action is commenced within six (6) months after **Substantial Completion**; except that:

56.2.1 Any claims arising out of events occurring after **Substantial Completion** and before **Final Acceptance** of the **Work** shall be asserted within six (6) months of **Final Acceptance** of the **Work**;

56.2.2 Any claims for monies deducted, retained or withheld under the provisions of this **Contract** shall be asserted within six (6) months after the date when such monies otherwise become due and payable hereunder; and

56.2.3 If the **Commissioner** exercises his/her right to terminate the **Contract** pursuant to Article 64, any such action shall be commenced within six (6) months of the date the **Commissioner** exercises said right.

ARTICLE 57. INFRINGEMENT

57.1 The **Contractor** shall be solely responsible for and shall defend, indemnify, and hold the **City** harmless from any and all claims (even if the allegations of the lawsuit are without merit) and judgments for damages and from costs and expenses to which the **City** may be subject to or which it may suffer or incur allegedly arising out of or in connection with any infringement by the **Contractor** of any copyright, trade secrets, trademark or patent rights or any other property or personal right of any third party by the **Contractor** and/or its **Subcontractors** in the performance or completion of the **Work**. Insofar as the facts or **Law** relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent permitted by **Law**.

## ARTICLE 58. NO CLAIM AGAINST OFFICIALS, AGENTS OR EMPLOYEES

58.1 No claim whatsoever shall be made by the Contractor against any official, agent or employee of the City for, or on account of, anything done or omitted to be done in connection with this Contract.

## ARTICLE 59. SERVICE OF NOTICES

59.1 The Contractor hereby designates the business address, fax number, and email address specified in its bid, as the place where all notices, directions or other communications to the Contractor may be delivered, or to which they may be mailed. Any notice, direction, or communication from either party to the other shall be in writing and shall be deemed to have been given when (i) delivered personally; (ii) sent by certified mail, return receipt requested; (iii) delivered by overnight or same day courier service in a properly addressed envelope with confirmation; or (iv) sent by fax or email and, unless receipt of the fax or e-mail is acknowledged by the recipient by fax or e-mail, deposited in a post office box regularly maintained by the United States Postal Service in a properly addressed, postage pre-paid envelope.

59.2 Contractor's notice address, email address, or fax number may be changed at any time by an instrument in writing, executed and acknowledged by the Contractor, and delivered to the Commissioner.

59.3 Nothing herein contained shall, however, be deemed to preclude or render inoperative the service of any notice, direction or other communication upon the Contractor personally, or, if the Contractor is a corporation, upon any officer thereof.

## ARTICLE 60. UNLAWFUL PROVISIONS DEEMED STRICKEN FROM CONTRACT

60.1 If this Contract contains any unlawful provision not an essential part of the Contract and which shall not appear to have been a controlling or material inducement to the making thereof, the same shall be deemed of no effect and shall, upon notice by either party, be deemed stricken from the Contract without affecting the binding force of the remainder.

## ARTICLE 61. ALL LEGAL PROVISIONS DEEMED INCLUDED

61.1 It is the intent and understanding of the parties to this Contract that each and every provision of Law required to be inserted in this Contract shall be and is inserted herein. Furthermore, it is hereby stipulated that every such provision is to be deemed to be inserted herein, and if, through mistake or otherwise, any such provision is not inserted, or is not inserted in correct form, then this Contract shall forthwith upon the application of either party be amended by such insertion so as to comply strictly with the Law and without prejudice to the rights of either party hereunder.

## ARTICLE 62. TAX EXEMPTION

62.1 The City is exempt from payment of Federal, State, and local taxes, including sales and compensating use taxes of the State of New York and its cities and counties on all tangible personal property sold to the City pursuant to the provisions of this Contract. These taxes are not to be included in bids. However, this exemption does not apply to tools, machinery, equipment or other property leased by or to the Contractor, Subcontractor or Materialman or to tangible personal property which, even



though it is consumed, is not incorporated into the completed **Work** (consumable supplies) and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**. The **Contractor** and its **Subcontractors** and **Materialmen** shall be responsible for and pay any and all applicable taxes, including sales and compensating use taxes, on such leased tools, machinery, equipment or other property and upon all such consumable supplies and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**.

62.2 The **Contractor** agrees to sell and the **City** agrees to purchase all tangible personal property, other than consumable supplies and other tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**, that is required, necessary or proper for or incidental to the construction of the **Project** covered by this **Contract**. The sum paid under this **Contract** for such tangible personal property shall be in full payment and consideration for the sale of such tangible personal property.

62.2.1 The **Contractor** agrees to construct the **Project** and to perform all **Work**, labor and services rendered, necessary, proper or incidental thereto for the sum shown in the bid for the performance of such **Work**, labor, and services, and the sum so paid pursuant to this **Contract** for such **Work**, labor, and services, shall be in full consideration for the performance by the **Contractor** of all its duties and obligations under this **Contract** in connection with said **Work**, labor, and services.

62.3 20 NYCRR Section 541.3(d) provides that a **Contractor's** purchases of tangible personal property that is either incorporated into real property owned by a governmental entity or purchased for and sold to a governmental entity are exempt from sales and use tax. The **City** shall not pay sales tax for any such tangible personal property that it purchases from the **Contractor** pursuant to the **Contract**. With respect to such tangible personal property, the **Contractor**, at the request of the **City**, shall furnish to the **City** such bills of sale and other instruments as may be required by the **City**, properly executed, acknowledged and delivered assuring to the **City** title to such tangible personal property, free of liens and/or encumbrances, and the **Contractor** shall mark or otherwise identify all such tangible personal property as the property of the **City**.

62.4 Title to all tangible personal property to be sold by the **Contractor** to the **City** pursuant to the provisions of the **Contract** shall immediately vest in and become the sole property of the **City** upon delivery of such tangible personal property to the **Site**. Notwithstanding such transfer of title, the **Contractor** shall have the full and continuing responsibility to install such tangible personal property in accordance with the provisions of this **Contract**, protect it, maintain it in a proper condition and forthwith repair, replace and make good any damage thereto, theft or disappearance thereof, and furnish additional tangible personal property in place of any that may be lost, stolen or rendered unusable, without cost to the **City**, until such time as the **Work** covered by the **Contract** is fully accepted by the **City**. Such transfer of title shall in no way affect any of the **Contractor's** obligations hereunder. In the event that, after title has passed to the **City**, any of the tangible personal property is rejected as being defective or otherwise unsatisfactory, title to all such tangible personal property shall be deemed to have been transferred back to the **Contractor**.

62.5 The purchase by **Subcontractors** or **Materialmen** of tangible personal property to be sold hereunder shall be a purchase or procurement for resale to the **Contractor** (either directly or through other **Subcontractors**) and therefore not subject to the aforesaid sales and compensating use taxes, provided that the subcontracts and purchase agreements provide for the resale of such tangible personal property and that such subcontracts and purchase agreements are in a form similar to this **Contract** with respect to the separation of the sale of consumable supplies and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work** from the **Work** and labor, services, and any other matters to be provided, and provided further that the subcontracts and

purchase agreements provide separate prices for tangible personal property and all other services and matters. Such separation shall actually be followed in practice, including the separation of payments for tangible personal property from the payments for other Work and labor and other things to be provided.

62.6 The **Contractor** and its **Subcontractors** and **Materialmen** shall furnish a **Contractor Exempt Purchase Certificate** to all persons, firms or corporations from which they purchase tangible personal property for the performance of the **Work** covered by this **Contract**.

62.7 In the event any of the provisions of this Article 62 shall be deemed to be in conflict with any other provisions of this **Contract** or create any ambiguity, then the provisions of this Article 62 shall control.

#### ARTICLE 63. INVESTIGATION(S) CLAUSE

63.1 The parties to this **Contract** agree to cooperate fully and faithfully with any investigation, audit or inquiry conducted by a United States, a State of New York (State) or a City governmental agency or authority that is empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath, or conducted by the Inspector General of a governmental agency that is a party in interest to the transaction, submitted bid, submitted proposal, contract, lease, permit or license that is the subject of the investigation, audit or inquiry.

63.2 If any person who has been advised that his/her statement, and any information from such statement, will not be used against him/her in any subsequent criminal proceeding refuses to testify before a grand jury or other governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath concerning the award of or performance under any transaction, agreement, lease, permit, contract, or license entered into with the City, the State, or any political subdivision or public authority thereof, or the Port Authority of New York and New Jersey, or any local development corporation within the City, or any public benefit corporation organized under the Laws of the State of New York, or;

63.3 If any person refuses to testify for a reason other than the assertion of his/her privilege against self incrimination in an investigation, audit or inquiry conducted by a City or State governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to take testimony under oath, or by the Inspector General of the governmental agency that is a party in interest in, and is seeking testimony concerning the award of, or performance under any transaction, agreement, lease, permit, contract, or license entered into with the City, the State, or any political subdivision thereof or any local development corporation within the City, then;

63.4 The **Commissioner** whose **Agency** is a party in interest to the transaction, submitted bid, submitted proposal, contract, lease, permit, or license shall convene a hearing, upon not less than five (5) **Days'** written notice to the parties involved to determine if any penalties should attach for the failure of a person to testify.

63.5 If any non-governmental party to the hearing requests an adjournment, the **Commissioner** who convened the hearing may, upon granting the adjournment, suspend any contract, lease, permit, or license, pending the final determination pursuant to Article 63.7 without the City incurring any penalty or damages for delay or otherwise.

63.6 The penalties which may attach after a final determination by the **Commissioner** may include but shall not exceed:

63.6.1 The disqualification for a period not to exceed five (5) years from the date of an adverse determination for any person, or any entity of which such person was a member at the time the testimony was sought, from submitting bids for, or transacting business with, or entering into or obtaining any contract, lease, permit or license with or from the City; and/or

63.6.2 The cancellation or termination of any and all such existing City contracts, leases, permits or licenses that the refusal to testify concerns and that have not been assigned as permitted under this Contract, nor the proceeds of which pledged, to an unaffiliated and unrelated institutional lender for fair value prior to the issuance of the notice scheduling the hearing, without the City incurring any penalty or damages on account of such cancellation or termination; monies lawfully due for goods delivered, work done, rentals, or fees accrued prior to the cancellation or termination shall be paid by the City.

63.7 The Commissioner shall consider and address in reaching his/her determination and in assessing an appropriate penalty the factors in Articles 63.7.1 and 63.7.2. The Commissioner may also consider, if relevant and appropriate, the criteria established in Articles 63.7.3 and 63.7.4, in addition to any other information which may be relevant and appropriate:

63.7.1 The party's good faith endeavors or lack thereof to cooperate fully and faithfully with any governmental investigation or audit, including but not limited to the discipline, discharge, or disassociation of any person failing to testify, the production of accurate and complete books and records, and the forthcoming testimony of all other members, agents, assignees or fiduciaries whose testimony is sought.

63.7.2 The relationship of the person who refused to testify to any entity that is a party to the hearing, including but not limited to, whether the person whose testimony is sought has an ownership interest in the entity and/or the degree of authority and responsibility the person has within the entity.

63.7.3 The nexus of the testimony sought to the subject entity and its contracts, leases, permits or licenses with the City.

63.7.4 The effect a penalty may have on an unaffiliated and unrelated party or entity that has a significant interest in an entity subject to penalties under Article 63.6, provided that the party or entity has given actual notice to the Commissioner upon the acquisition of the interest, or at the hearing called for in Article 63.4, gives notice and proves that such interest was previously acquired. Under either circumstance the party or entity shall present evidence at the hearing demonstrating the potential adverse impact a penalty will have on such person or entity.

#### 63.8 Definitions:

63.8.1 The term "license" or "permit" as used in this Article 63 shall be defined as a license, permit, franchise or concession not granted as a matter of right.

63.8.2 The term "person" as used in this Article 63 shall be defined as any natural person doing business alone or associated with another person or entity as a partner, director, officer, principal or employee.

63.8.3 The term "entity" as used in this Article 63 shall be defined as any firm, partnership, corporation, association, joint venture, or person that receives monies, benefits, licenses, leases, or permits from or through the City or otherwise transacts business with the City.

63.8.4 The term "member" as used in this Article 63 shall be defined as any person associated with another person or entity as a partner, director, officer, principal or employee.

63.9 In addition to and notwithstanding any other provision of this Contract, the Commissioner may in his/her sole discretion terminate this Contract upon not less than three (3) Days' written notice in the event the Contractor fails to promptly report in writing to the Commissioner of the Department of Investigations ("DOI") of the City any solicitation of money, goods, requests for future employment or other benefit or thing of value, by or on behalf of any employee of the City or other person, firm, corporation or entity for any purpose which may be related to the procurement or obtaining of this Contract by the Contractor, or affecting the performance of this Contract.

#### ARTICLE 64. TERMINATION BY THE CITY

64.1 In addition to termination pursuant to any other article of this Contract, the Commissioner may, at any time, terminate this Contract by written notice to the Contractor. In the event of termination, the Contractor shall, upon receipt of such notice, unless otherwise directed by the Commissioner:

64.1.1 Stop Work on the date specified in the notice;

64.1.2 Take such action as may be necessary for the protection and preservation of the City's materials and property;

64.1.3 Cancel all cancelable orders for material and equipment;

64.1.4 Assign to the City and deliver to the Site or another location designated by the Commissioner, any non-cancelable orders for material and equipment that is not capable of use except in the performance of this Contract and has been specifically fabricated for the sole purpose of this Contract and not incorporated in the Work;

64.1.5 Take no action which will increase the amounts payable by the City under this Contract.

64.2 In the event of termination by the City pursuant to this Article 64, payment to the Contractor shall be in accordance with Articles 64.2.1, 64.2.2 or 64.2.3, to the extent that each respective article applies.

64.2.1 Lump Sum Contracts or Items: On all lump sum Contracts, or on lump sum items in a Contract, the City will pay the Contractor the sum of the amounts described in Articles 64.2.1(a) and 64.2.1(b), less all payments previously made pursuant to this Contract. On lump sum Contracts only, the City will also pay the Contractor an additional sum as provided in Article 64.2.1(c).

64.2.1(a) For Work completed prior to the notice of termination, the Contractor shall be paid a pro rata portion of the lump sum bid amount, plus approved change orders, based upon the percent completion of the Work, as determined by the Commissioner. For the purpose of determining the pro rata portion of the lump sum bid amount to which the Contractor is entitled, the bid breakdown submitted in accordance with Article 41 shall be considered, but shall not be dispositive. The Commissioner's determination hereunder shall be final, binding, and conclusive.

64.2.1(b) For non-cancelable material and equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract**, but not yet incorporated in the **Work**, the **Contractor** shall be paid the lesser of the following, less salvage value:

64.2.1(b)(i) The Direct Cost, as defined in Article 64.2.4; or

64.2.1(b)(ii) The fair and reasonable value, if less than Direct Cost, of such material and equipment, plus necessary and reasonable delivery costs.

64.2.1(b)(iii) In addition, the **Contractor** shall be paid five (5%) percent of the amount described in Article 64.2.1(b)(i) or Article 64.2.1(b)(ii), whichever applies.

64.2.1(c) Except as otherwise provided in Article 64.2.1(d), on all lump sum **Contracts**, the **Contractor** shall be paid the percentage indicated below applied to the difference between the total lump sum bid amount and the total of all payments made prior to the notice of termination plus all payments allowed pursuant to Articles 64.2.1(a) and 64.2.1(b):

64.2.1(c)(i) Five (5%) percent of the first five million (\$5,000,000) dollars; and

64.2.1(c)(ii) Three (3%) percent of any amount between five million (\$5,000,000) dollars and fifteen million (\$15,000,000) dollars; plus

64.2.1(c)(iii) One (1%) percent of any amount over fifteen million (\$15,000,000) dollars.

64.2.1(d) In the event the **City** terminates a lump sum **Contract** pursuant to this Article 64 within ninety (90) **Days** after registration of the **Contract** with the **Comptroller**, the **Contractor** shall be paid one (1%) percent of the difference between the lump sum bid amount and the total of all payments made pursuant to this Article 64.2.

64.2.2 **Unit Price Contracts or Items:** On all unit price **Contracts**, or on unit price items in a **Contract**, the **City** will pay the **Contractor** the sum of the amounts described in Articles 64.2.2(a) and 64.2.2(b), less all payments previously made pursuant to this **Contract**:

64.2.2(a) For all completed units, the unit price stated in the **Contract**, and

64.2.2(b) For units that have been ordered but are only partially completed, the **Contractor** will be paid:

64.2.2(b)(i) A pro rata portion of the unit price stated in the **Contract** based upon the percent completion of the unit and

64.2.2(b)(ii) For non-cancelable material and equipment, payment will be made pursuant to Article 64.2.1(b).

64.2.3 **Time and Materials Contracts or Items Based on Time and Material Records:** On all **Contracts** or items in a **Contract** where payment for the **Work** is based on time and

material records, the **Contractor** shall be paid in accordance with Article 26, less all payments previously made pursuant to this **Contract**.

64.2.4 Direct Costs: Direct Costs as used in this Article 64.2 shall mean:

64.2.4(a) The actual purchase price of material and equipment, plus necessary and reasonable delivery costs,

64.2.4(b) The actual cost of labor involved in construction and installation at the Site, and

64.2.4(c) The actual cost of necessary bonds and insurance purchased pursuant to requirements of this **Contract** less any amounts that have been or should be refunded by the **Contractor's** sureties or insurance carriers.

64.2.4(d) Direct Costs shall not include overhead.

64.3 In no event shall any payments under this Article 64 exceed the **Contract** price for such items.

64.4 All payments pursuant to Article 64 shall be in the nature of liquidated damages and shall be accepted by the **Contractor** in full satisfaction of all claims against the **City**.

64.5 The **City** may deduct or set off against any sums due and payable pursuant to this Article 64, any deductions authorized by this **Contract** or by **Law** (including but not limited to liquidated damages) and any claims it may have against the **Contractor**. The **City's** exercise of the right to terminate the **Contract** pursuant to this Article 64 shall not impair or otherwise effect the **City's** right to assert any claims it may have against the **Contractor** in a plenary action.

64.6 Where the **Work** covered by the **Contract** has been substantially completed, as determined in writing by the **Commissioner**, termination of the **Work** shall be handled as an omission of **Work** pursuant to Articles 29 and 33, in which case a change order will be issued to reflect an appropriate reduction in the **Contract** sum, or if the amount is determined after final payment, such amount shall be paid by the **Contractor**.

#### **ARTICLE 65. CHOICE OF LAW, CONSENT TO JURISDICTION AND VENUE**

65.1 This **Contract** shall be deemed to be executed in the **City** regardless of the domicile of the **Contractor**, and shall be governed by and construed in accordance with the **Laws** of the State of New York and the **Laws** of the United States, where applicable.

65.2 The parties agree that any and all claims asserted against the **City** arising under this **Contract** or related thereto shall be heard and determined in the courts of the State of New York ("New York State Courts") located in the **City** and County of New York. To effect this **Contract** and intent, the **Contractor** agrees:

65.2.1 If the **City** initiates any action against the **Contractor** in Federal court or in a New York State Court, service of process may be made on the **Contractor** either in person, wherever such **Contractor** may be found, or by registered mail addressed to the **Contractor** at its address as set forth in this **Contract**, or to such other address as the **Contractor** may provide to the **City** in writing; and

65.2.2 With respect to any action between the City and the Contractor in a New York State Court, the Contractor hereby expressly waives and relinquishes any rights it might otherwise have:

65.2.2(a) To move to dismiss on grounds of forum non conveniens;

65.2.2(b) To remove to Federal Court; and

65.2.2(c) To move for a change of venue to a New York State Court outside New York County.

65.2.3 With respect to any action brought by the City against the Contractor in a Federal Court located in the City, the Contractor expressly waives and relinquishes any right it might otherwise have to move to transfer the action to a Federal Court outside the City.

65.2.4 If the Contractor commences any action against the City in a court located other than in the City and County of New York, upon request of the City, the Contractor shall either consent to a transfer of the action to a New York State Court of competent jurisdiction located in the City and County of New York or, if the Court where the action is initially brought will not or cannot transfer the action, the Contractor shall consent to dismiss such action without prejudice and may thereafter reinstate the action in a New York State Court of competent jurisdiction in New York County.

65.3 If any provision(s) of this Article 65 is held unenforceable for any reason, each and all other provision(s) shall nevertheless remain in full force and effect.

#### **ARTICLE 66. PARTICIPATION IN AN INTERNATIONAL BOYCOTT**

66.1 The Contractor agrees that neither the Contractor nor any substantially owned affiliated company is participating or shall participate in an international boycott in violation of the provisions of the Federal Export Administration Act of 1979, as amended, or the regulations of the United States Department of Commerce (Commerce Department) promulgated thereunder.

66.2 Upon the final determination by the Commerce Department or any other agency of the United States as to, or conviction of the Contractor or a substantially-owned affiliated company thereof for participation in an international boycott in violation of the provisions of the Export Administration Act of 1979, as amended, or the regulations promulgated thereunder, the Comptroller may, at his/her option, render forfeit and void this Contract.

66.3 The Contractor shall comply in all respects, with the provisions of Section 6-114 of the Administrative Code and the rules and regulations issued by the Comptroller thereunder.

#### **ARTICLE 67. LOCALLY BASED ENTERPRISE PROGRAM**

67.1 This Contract is subject to the requirements of Section 6-108.1 of the Administrative Code and regulations promulgated thereunder. No construction contract shall be awarded unless and until these requirements have been complied with in their entirety; however, compliance with this Article 67 is not required if the Agency sets Subcontractor Participation Goals for Minority- and Women-Owned Business Enterprises (M/WBEs).

67.2 Unless specifically waived by the Commissioner with the approval of the Division of Economic and Financial Opportunity of the City Department of Business Services, if any portion of the Contract is subcontracted, not less than ten (10%) percent of the total dollar amount of the Contract shall be awarded to locally based enterprises (LBEs); except that where less than ten (10%) percent of the total dollar amount of the Contract is subcontracted, such lesser percentage shall be so awarded.

67.3 The Contractor shall not require performance and payment bonds from LBE Subcontractors.

67.4 If the Contractor has indicated prior to award that no Work will be subcontracted, no Work shall be subcontracted without the prior approval of the Commissioner, which shall be granted only if the Contractor makes a good faith effort beginning at least six (6) weeks before the Work is to be performed to obtain LBE Subcontractors to perform the Work.

67.5 If the Contractor has not identified sufficient LBE Subcontractors prior to award, it shall sign a letter of compliance stating that it complies with Section 6-108.1 of the Administrative Code, recognizes that achieving the LBE requirement is a condition of its Contract, and shall submit documentation demonstrating its good faith efforts to obtain LBEs. After award, the Contractor shall begin to solicit LBE's to perform subcontracted Work at least six (6) weeks before the date such Work is to be performed and shall demonstrate that a good faith effort has been made to obtain LBEs on each subcontract until it meets the required percentage.

67.6 Failure of the Contractor to comply with the requirements of Section 6-108.1 of the Administrative Code and the regulations promulgated thereunder shall constitute a material breach of this Contract. Remedy for such breach may include the imposition of any or all of the following sanctions:

67.6.1 Reducing the Contractor's compensation by an amount equal to the dollar value of the percentage of the LBE subcontracting requirement not complied with;

67.6.2 Declaring the Contractor in default;

67.6.3 If the Contractor is an LBE, de-certifying and declaring the Contractor ineligible to participate in the LBE program for a period of up to three (3) years.

#### ARTICLE 68. ANTITRUST

68.1 The Contractor hereby assigns, sells, and transfers to the City all right, title, and interest in and to any claims and causes of action arising under the antitrust Laws of New York State or of the United States relating to the particular goods or services purchased or procured by the City under this Contract.

#### ARTICLE 69. MacBRIDE PRINCIPLES PROVISIONS

69.1 Notice To All Prospective Contractors:

69.1.1 Local Law No. 34 of 1991 became effective on September 10, 1991 and added Section 6-115.1 of the Administrative Code. The local Law provides for certain restrictions on City Contracts to express the opposition of the people of the City to employment discrimination practices in Northern Ireland to promote freedom of work-place opportunity.

69.1.2 Pursuant to Section 6-115.1, prospective Contractors for Contracts to provide goods or services involving an expenditure of an amount greater than ten thousand



(\$10,000.) dollars, or for construction involving an amount greater than fifteen thousand (\$15,000.) dollars, are asked to sign a rider in which they covenant and represent, as a material condition of their **Contract**, that any business operations in Northern Ireland conducted by the **Contractor** and any individual or legal entity in which the **Contractor** holds a ten (10%) percent or greater ownership interest in the **Contractor** will be conducted in accordance with the MacBride Principles of nondiscrimination in employment.

69.1.3 Prospective **Contractors** are not required to agree to these conditions. However, in the case of **Contracts** let by competitive sealed bidding, whenever the lowest responsible bidder has not agreed to stipulate to the conditions set forth in this notice and another bidder who has agreed to stipulate to such conditions has submitted a bid within five (5%) percent of the lowest responsible bid for a **Contract** to supply goods, services or construction of comparable quality, the **Agency** shall refer such bids to the Mayor, the Speaker or other officials, as appropriate, who may determine, in accordance with applicable **Law**, that it is in the best interest of the **City** that the **Contract** be awarded to other than the lowest responsible pursuant to Section 313(b)(2) of the **City Charter**.

69.1.4 In the case of **Contracts** let by other than competitive sealed bidding, if a prospective **Contractor** does not agree to these conditions, no **Agency**, elected official or the **City Council** shall award the **Contract** to that bidder unless the **Agency** seeking to use the goods, services or construction certifies in writing that the **Contract** is necessary for the **Agency** to perform its functions and there is no other responsible **Contractor** who will supply goods, services or construction of comparable quality at a comparable price.

69.2 In accordance with Section 6-115.1 of the Administrative Code, the **Contractor** stipulates that such **Contractor** and any individual or legal entity in which the **Contractor** holds a ten (10%) percent or greater ownership interest in the **Contractor** either:

69.2.1 Have no business operations in Northern Ireland, or

69.2.2 Shall take lawful steps in good faith to conduct any business operations they have in Northern Ireland in accordance with the MacBride Principles, and shall permit independent monitoring of their compliance with such principles.

69.3 For purposes of this Article, the following terms shall have the following meanings:

69.3.1 "MacBride Principles" shall mean those principles relating to nondiscrimination in employment and freedom of work-place opportunity which require employers doing business in Northern Ireland to:

69.3.1(a) increase the representation of individuals from under-represented religious groups in the workforce, including managerial, supervisory, administrative, clerical and technical jobs;

69.3.1(b) take steps to promote adequate security for the protection of employees from under-represented religious groups both at the work-place and while traveling to and from **Work**;

69.3.1(c) ban provocative religious or political emblems from the workplace;

69.3.1(d) publicly advertise all job openings and make special recruitment efforts to attract applicants from under-represented religious groups;

69.3.1(e) establish layoff, recall, and termination procedures which do not in practice favor a particular religious group;

69.3.1(f) abolish all job reservations, apprenticeship restrictions and different employment criteria which discriminate on the basis of religion;

69.3.1(g) develop training programs that will prepare substantial numbers of current employees from under-represented religious groups for skilled jobs, including the expansion of existing programs and the creation of new programs to train, upgrade, and improve the skills of workers from under-represented religious groups;

69.3.1(h) establish procedures to assess, identify, and actively recruit employees from under-represented religious groups with potential for further advancement; and

69.3.1(i) appoint a senior management staff member to oversee affirmative action efforts and develop a timetable to ensure their full implementation.

69.4 The Contractor agrees that the covenants and representations in Article 69.2 are material conditions to this Contract. In the event the Agency receives information that the Contractor who made the stipulation required by this Article 69 is in violation thereof, the Agency shall review such information and give the Contractor an opportunity to respond. If the Agency finds that a violation has occurred, the Agency shall have the right to declare the Contractor in default and/or terminate this Contract for cause and procure supplies, services or Work from another source in the manner the Agency deems proper. In the event of such termination, the Contractor shall pay to the Agency, or the Agency in its sole discretion may withhold from any amounts otherwise payable to the Contractor, the difference between the Contract price for the uncompleted portion of this Contract and the cost to the Agency of completing performance of this Contract either itself or by engaging another Contractor or Contractors. In the case of a requirement Contract, the Contractor shall be liable for such difference in price for the entire amount of supplies required by the Agency for the uncompleted term of Contractor's Contract. In the case of a construction Contract, the Agency shall also have the right to hold the Contractor in partial or total default in accordance with the default provisions of this Contract, and/or may seek debarment or suspension of the Contractor. The rights and remedies of the Agency hereunder shall be in addition to, and not in lieu of, any rights and remedies the Agency has pursuant to this Contract or by operation of Law.

#### **ARTICLE 70. ELECTRONIC FILING/NYC DEVELOPMENT HUB**

70.1 The Contractor shall electronically file all alteration type-2 and alteration type-3 applications via the New York City Development Hub Web site, except applications for the following types of minor alterations: enlargements, curb cuts, legalizations, fire alarms, builders pavement plans, and jobs filed on Landmark Preservation Commission calendared properties. All such filings must be professionally certified. Information about electronic filing via the New York City Development Hub is available on the City Department of Buildings Web site at [www.nyc.gov/buildings](http://www.nyc.gov/buildings).

#### **ARTICLE 71. PROHIBITION OF TROPICAL HARDWOODS**

71.1 Tropical hardwoods, as defined in Section 165 of the New York State Finance Law (Finance Law), shall not be utilized in the performance of this Contract except as expressly permitted by Section 165 of the Finance Law.

## ARTICLE 72. CONFLICTS OF INTEREST

72.1 Section 2604 of the City Charter and other related provisions of the City Charter, the Administrative Code, and the Penal Law are applicable under the terms of this Contract in relation to conflicts of interest and shall be extended to Subcontractors authorized to perform Work, labor and services pursuant to this Contract and further, it shall be the duty and responsibility of the Contractor to so inform its respective Subcontractors. Notice is hereby given that, under certain circumstances, penalties may be invoked against the donor as well as the recipient of any form of valuable gift.

## ARTICLE 73. MERGER CLAUSE

73.1 The written Contract herein, contains all the terms and conditions agreed upon by the parties hereto, and no other agreement, oral or otherwise, regarding the subject matter of this Contract shall be deemed to exist or to bind any of the parties hereto, or to vary any of the terms contained herein.

## ARTICLE 74. STATEMENT OF WORK

74.1 The Contractor shall furnish all labor and materials and perform all Work in strict accordance with the Specifications and Addenda thereto, numbered \_\_\_\_\_.

## 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 of: \_\_\_\_\_ Dollars, (\$ \_\_\_\_\_), 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 of 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. PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED BUSINESS ENTERPRISES IN CITY PROCUREMENT

##### NOTICE TO ALL PROSPECTIVE CONTRACTORS

#### ARTICLE I. M/WBE PROGRAM

Local Law No. 129 of 2005 added and Local Law 1 of 2013 amended Section 6-129 of the Administrative Code of the City of New York (hereinafter "Section 6-129"). 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. 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 I to this Contract (see Page 1, line 1 Total Participation Goals) or will be set forth on Schedule B, Part I 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 New York City Department of Small Business Services 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 II (see Pages 2-4) 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; and (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. 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 II (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 nonresponsive.

(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 II (see Pages 2-4) 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; and (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. 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 II). A SCHEDULE B SUBMITTED BY THE BIDDER/PROPOSER WHICH DOES NOT INCLUDE THE VENDOR CERTIFICATION AND REQUIRED AFFIRMATIONS (SEE SECTION V OF PART II) WILL BE DEEMED TO BE NON-RESPONSIVE, UNLESS A FULL WAIVER OF THE PARTICIPATION GOALS IS GRANTED (SCHEDULE B, PART III). 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 multiyear 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 MBE and WBE firms may be obtained from the DSBS website at [www.nyc.gov/buycertified](http://www.nyc.gov/buycertified), by emailing DSBS at [buyer@sbs.nyc.gov](mailto:buyer@sbs.nyc.gov), by calling (212) 513-6356, or by visiting or writing DSBS at 110 William St., New York, New York, 10038, 7th floor. Eligible firms that have not yet been certified may contact DSBS in order to seek certification by visiting [www.nyc.gov/getcertified](http://www.nyc.gov/getcertified), emailing [MWBE@sbs.nyc.gov](mailto: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 III (Page 5) 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 [poped@ddc.nyc.gov](mailto:poped@ddc.nyc.gov) or via facsimile at (718) 391-1886. Bidders, proposers, or contractors, as applicable, who have submitted 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 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.

13. 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.

14. 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 an 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 an 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**

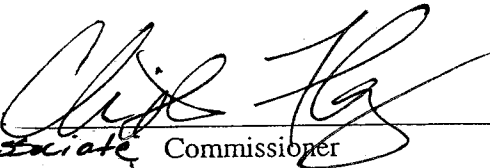
1. If Agency determines that a bidder or proposer, as applicable, has, in relation to this procurement, violated Section 6-129 or the DSBS rules promulgated pursuant to Section 6-129, Agency may disqualify such bidder or proposer, as applicable, from competing for this Contract and the Agency may revoke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

IN WITNESS WHEREOF, the <sup>Associate</sup> Commissioner, on behalf of the City of New York, and the Contractor, have executed this agreement in quadruplicate, two parts of which are to remain with the Commissioner, another to be filed with the Comptroller of the City, and the fourth to be delivered to the Contractor.

THE CITY OF NEW YORK


By:   
Associate Commissioner

CONTRACTOR: NATIONAL ENVIRONMENTAL SAFETY COMPANY, INC

By:   
(Member of Firm or Officer of Corporation)

Title: V.P.

(Where Contractor is a Corporation, add):  
Attest:

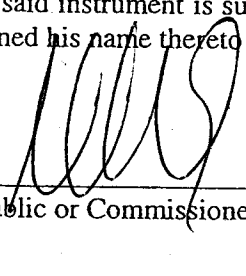
  
Secretary

(Seal)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of NY County of Queens ss:

On this 27 day of June 2016, before me personally came Mark Canellos to me known, who, being by me duly sworn did depose and say that he resides at 24-40 Little Neck Blvd Bayside NY 11360 that he is the V.P 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.

VICTORIA AYO-VAUGHAN  
Notary Public, State of New York  
Registration #01AY5014042  
Qualified in Queens County  
Commission Expires July 15, 2019  


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:

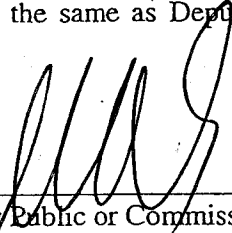
On this \_\_\_\_\_ day of \_\_\_\_\_, before me personally appeared \_\_\_\_\_ to me known, and known to me to be the person described in and who executed the foregoing instrument; and acknowledged that he executed the same.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT BY COMMISSIONER

State of New York County of Queens ss:

On this 27 day of June 2016 before me personally came Christine Flaherty to me known, and known to be the ~~Deputy~~ <sup>Associate</sup> Commissioner of the Department of Design and Construction of The City of New York, the person described as such in and who as such executed the foregoing instrument and he acknowledged to me that he executed the same as Deputy Commissioner for the purposes therein mentioned.



\_\_\_\_\_  
Notary Public or Commissioner of Deeds

VICTORIA AYO-VAUGHAN  
Notary Public, State of New York  
Registration #01AY5014042  
Qualified in Queens County  
Commission Expires July 15, 2019

AUTHORITY

MAYOR'S CERTIFICATE NO. CBX  
BUDGET DIRECTOR'S CERTIFICATE NO.

DATED  
DATED

APPROPRIATION  
COMMISSIONER'S CERTIFICATE

In conformity with the provisions of Section 6-101 of the Administrative Code of the City of New York, it is hereby certified that the estimated cost of the work, materials and supplies required by the within Contract, amounting to

Seven million Nine hundred Sixty two  
Thousand Sixty Four hundred

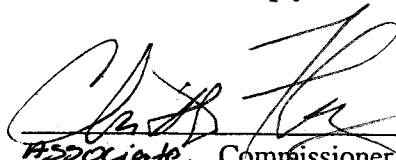
Dollars (\$ 7,962,064.00)

is chargeable to the fund of the Department of Design and Construction entitled Code

LQQ 122 EE2

Department of Design and Construction

I hereby certify that the specifications contained herein comply with the terms and conditions of the BUDGET.

  
Associate Commissioner

COMPTROLLER'S CERTIFICATE

The City of New York \_\_\_\_\_

Pursuant to the provisions of Section 6-101 of the Administrative Code of the City of New York, I hereby certify that there remains unapplied and unexpended a balance of the above mentioned fund applicable to this Contract sufficient to pay the estimated expense of executing the same viz:

\$ \_\_\_\_\_

\_\_\_\_\_  
Comptroller

**MAYOR'S CERTIFICATE OR  
CERTIFICATE OF THE DIRECTOR  
OF THE BUDGET**

**Performance Bond #1 (Pages 90 to 93):** 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)

PERFORMANCE BOND #1

KNOW ALL PERSONS BY THESE PRESENTS, That we, \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

hereinafter referred to as the "Principal", and \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns, in the penal sum of

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(\$ \_\_\_\_\_) Dollars, lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

**Performance Bond #1 (Pages 90 to 93): 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 2)

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the City from all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making good any such default and shall protect the said City of New York against, and pay any and all amounts, damages, cost and judgments which may or shall be recovered against said City or its officers or agents or which the said City of New York may be called upon to pay any person or corporation by reason of any damages arising or growing out of the Principal's default of the Contract, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the City that the City has determined that the Principal is in default of the Contract, to (1) pay the City the cost to complete the contract as determined by the City in excess of the balance of the Contract held by the City, plus any damages or costs to which the City is entitled, up to the full amount of the above penal sum, (2) fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof, or (3) tender a completion Contractor that is acceptable to the City. The Surety (Sureties) further agrees, at its option, either to notify the City that it elects to pay the city the cost of completion plus any applicable damages and costs under option (1) above, or to commence and diligently perform the Work specified in the Contract, including physical site work, within twenty-five (25) business days after written notice thereof from the City and, if the Surety elects to fully perform and complete the Work, then to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. If the Surety elects to tender payment pursuant to (1) above, then the Surety shall tender such amount within fifteen (15) business days notification from the City of the cost of completion. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to pay the City the cost of completion, to commence and complete all Work as provided herein, or to tender a completion contractor.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or to the said Contract or the Work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, and waivers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to subcontractors shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal. Notwithstanding the above, if the City makes payments to the Principal before the time required by the contract that in the aggregate exceed \$100,000 or 10% of the Contract price, whichever is less, and that have not become earned prior to the Principal being found to be in default, then all payments made to the Principal before the time required by the Contract shall be added to the remaining contract value available to be paid for the completion of the Contract as if such sums had not been paid to the Principal, but shall not provide a basis for non-performance of its obligation to pay the City the cost of completion, to commence and to complete all Work as provided herein, or to tender a completion contractor.



**Performance Bond #1 (Pages 90 to 93):** 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 3)

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

(Seal) \_\_\_\_\_ (L.S.)  
Principal

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

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

**Performance Bond #1 (Pages 90 to 93): 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 4)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, before me personally came \_\_\_\_\_ to me known, who, being by me duly sworn did depose and say that he resides at \_\_\_\_\_ that he is the \_\_\_\_\_ 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.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ before me personally appeared \_\_\_\_\_ to me known, and known to me to be one of the members of the firm of \_\_\_\_\_ described in and who executed the foregoing instrument; and he acknowledged to me that he executed the same as and for the act and deed of said firm.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ before me personally appeared \_\_\_\_\_ to me known, and known to me to be the person described in and who executed the foregoing instrument; and acknowledged that he executed the same.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

\* \* \* \* \*

Affix Acknowledgments and Justification of Sureties

Performance Bond #2 (Pages 94 to 97): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page 1)

PERFORMANCE BOND #2      **BOND NO. 9204017**

KNOW ALL PERSONS BY THESE PRESENTS, That we, \_\_\_\_\_

**National Environmental Safety Company, Inc.**

**12-17 38th Avenue**

**Long Island City, NY 11101**

hereinafter referred to as the "Principal", and \_\_\_\_\_

**Fidelity and Deposit Company of Maryland**

**1400 American Lane, Tower I, 18th Fl**

**Schaumburg, IL 60196**

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

**Seven Million Eight Hundred Fifty Thousand and 00/100 Dollars**

(**\$ 7,850,000.00** \_\_\_\_\_) 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

**East Elmhurst Branch Library Expansion - Borough of Queens**

**FMS ID: LQQ122EE2**

**E-PIN: 85014B0176001 - DDC PIN: 8502014LQ0006C**

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

Performance Bond #2 (Pages 94 to 97): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page2)

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the City from all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making good any such default and shall protect the said City of New York against, and pay any and all amounts, damages, cost and judgments which may or shall be recovered against said City or its officers or agents or which the said City of New York may be called upon to pay any person or corporation by reason of any damages arising or growing out of the Principal's default of the Contract, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the City that the City has determined that the Principal is in default of the Contract, to either (1) pay the full amount of the above penal sum in complete discharge and exoneration of this bond and of all the liabilities of the Surety relating to this bond, or (2) fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof. The Surety (Sureties) further agrees, at its option, either to tender the penal sum or to commence and diligently perform the Work specified in the Contract, including physical site work, within twenty-five (25) business days after written notice thereof from the City and to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to commence and to complete all Work as provided herein.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or to the said Contract or the Work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any Work to be performed or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal.

Performance Bond #2 (Pages 94 to 97): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page 3)

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this 23rd day of June, 2016.

(Seal)

**National Environmental Safety Company, Inc. (L.S.)**

Principal

By: 

(Seal)

**Fidelity and Deposit Company of Maryland**

Surety

By:   
Wayne D. Nowland, Attorney-in-Fact

(Seal)

\_\_\_\_\_  
Surety

By: \_\_\_\_\_

(Seal)

\_\_\_\_\_  
Surety

By: \_\_\_\_\_

(Seal)

\_\_\_\_\_  
Surety

By: \_\_\_\_\_

(Seal)

\_\_\_\_\_  
Surety

Bond Premium Rate \$10.80 slide

Bond Premium Cost \$54,120.00

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

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

Performance Bond #2 (Pages 94 to 97): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page 4)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of NY County of Queens ss:

On this 27 day of July, 2016 before me personally came Mark Canellos to me known, who, being by me duly sworn did depose and say that he/she resides at 24-40 Little Neck Blvd 11360 Queens NY; that he/she is the V.P. of the National Environmental Safety Corp Inc corporation described in and which executed the foregoing instrument; and that he signed his name to the foregoing instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

Jamie Rivera  
Notary Public or Commissioner of Deeds

JAMIE RIVERA  
Notary Public - State of New York  
No. 01R18245854  
Bronx County  
Comm. Exp. August 8, 2019

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ before me personally came \_\_\_\_\_ to me known, who, being by me duly sworn did depose and say that he/she resides at \_\_\_\_\_; that he/she is \_\_\_\_\_ partner of \_\_\_\_\_, a limited/general partnership existing under the laws of the State of \_\_\_\_\_ the partnership described in and which executed the foregoing instrument; and that he/she signed his/her name to the foregoing instrument as the duly authorized and binding act of said partnership.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_ before me personally came \_\_\_\_\_ to me known, who, being by me duly sworn did depose and say that he/she resides at \_\_\_\_\_, and that he/she is the individual whose name is subscribed to the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed the instrument.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

\* \* \* \* \*

Affix Acknowledgments and Justification of Sureties.

ACKNOWLEDGMENT OF SURETY

STATE OF NEW YORK

SS:

COUNTY OF SUFFOLK

On this **23rd** day of **June, 2016**, before me personally came **Wayne D. Nowland**, to me known, who, being by me duly sworn, did depose and say that (s)he is an Attorney-In-Fact of **Fidelity and Deposit Company of Maryland** the corporation described in and which executed the within instrument; that (s)he knows the corporate seal of said corporation; that the seal affixed to the within instrument is such corporate seal, and that (s)he signed and said instrument and affixed the said seal as Attorney-In-Fact by authority of the Board of Directors of said corporation and by authority of this office under the Standing Resolutions thereof.

My commission expires 2/18/2020

  
Notary Public

MATTHEW P KELLY  
NOTARY PUBLIC-STATE OF NEW YORK  
NO 01KE6336557  
QUALIFIED IN NASSAU COUNTY  
MY COMMISSION EXPIRES 02-08-2020

**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND  
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **MICHAEL BOND, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Susan P. HAMMEL and Wayne D. NOWLAND, both of MELVILLE, New York, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 3rd day of May, A.D. 2016.

**ATTEST:**

**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: *Eric D. Barnes*  
*Secretary*  
*Eric D. Barnes*

*Michael Bond*  
*Vice President*  
*Michael Bond*

State of Maryland  
County of Baltimore

On this 3rd day of May, A.D. 2016, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **MICHAEL BOND, Vice President, and ERIC D. BARNES, Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposed and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

*Constance A. Dunn*  
Constance A. Dunn, Notary Public  
My Commission Expires: July 9, 2019





**FIDELITY AND DEPOSIT COMPANY**

OF MARYLAND

600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

**Statement of Financial Condition**

As Of December 31, 2015

**ASSETS**

Bonds .....	\$ 142,878,497
Stocks .....	22,315,096
Cash and Short Term Investments.....	337,835
Reinsurance Recoverable .....	24,731,651
Other Accounts Receivable.....	19,935,844
<b>TOTAL ADMITTED ASSETS .....</b>	<b>\$ 210,198,923</b>

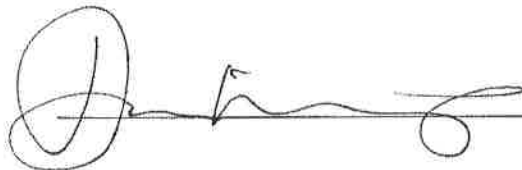
**LIABILITIES, SURPLUS AND OTHER FUNDS**

Reserve for Taxes and Expenses.....	\$ 46,436
Ceded Reinsurance Premiums Payable .....	40,456,309
Securities Lending Collateral Liability .....	0
<b>TOTAL LIABILITIES .....</b>	<b>\$ 40,502,745</b>
Capital Stock, Paid Up .....	\$ 5,000,000
Surplus .....	164,696,178
Surplus as regards Policyholders.....	169,696,178
<b>TOTAL .....</b>	<b>\$ 210,198,923</b>

Securities carried at \$57,996,983 in the above statement are deposited with various states as required by law.

Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of market quotations for all bonds and stocks owned, the Company's total admitted assets at December 31, 2015 would be \$212,137,795 and surplus as regards policyholders \$171,635,049.

I, DENNIS F. KERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2015.



*Corporate Secretary*

State of Illinois  
 City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois, in the City of Schaumburg, this 15th day of March, 2016.



*Notary Public*



**Payment Bond (Pages 98 to 101): Use for any contract for which a Payment Bond is required.**

PAYMENT BOND

PAYMENT BOND (Page 1)  
**BOND NO. 9204017**

KNOW ALL PERSONS BY THESE PRESENTS, That we, \_\_\_\_\_

**National Environmental Safety Company, Inc.**

**12-17 38th Avenue**

**Long Island City, NY NY 11101**

hereinafter referred to as the "Principal", and \_\_\_\_\_

**Fidelity and Deposit Company of Maryland**

**1400 American Lane, Tower I, 18th Fl**

**Schaumburg, IL 60196**

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

**Seven Million Eight Hundred Fifty Thousand and 00/100 Dollars**

(\$**7,850,000.00**) 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

**East Elmhurst Branch Library Expansion - Borough of Queens**

**FMS ID: LQQ122EE2**

**E-PIN: 85014B0176001 - DDC PIN: 8502014LQ0006C**

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

Payment Bond (Pages 98 to 101): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 2)

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 in full force and effect.

This bond is subject to the following additional conditions, limitations and agreements:

(a) The Principal and Surety (Sureties) agree that this bond shall be for the benefit of any materialmen or laborer having a just claim, as well as the City itself.

(b) All persons who have performed labor, rendered services or furnished materials and supplies, as aforesaid, shall have a direct right of action against the Principal and his, its or their successors and assigns, and the Surety (Sureties) herein, or against either or both or any of them and their successors and assigns. Such persons may sue in their own name, and may prosecute the suit to judgment and execution without the necessity of joining with any other persons as party plaintiff.

(c) The Principal and Surety (Sureties) agree that neither of them will hold the City liable for any judgment for costs of otherwise, obtained by either or both of them against a laborer or materialman in a suit brought by either a laborer or materialman under this bond for moneys allegedly due for performing work or furnishing material.

(d) The Surety (Sureties) or its successors and assigns shall not be liable for any compensation recoverable by an employee or laborer under the Workmen's Compensation Law.

(e) In no event shall the Surety (Sureties), or its successors or assigns, be liable for a greater sum than the penalty of this bond or be subject to any suit, action or proceeding hereon that is instituted by any person, firm, or corporation hereunder later than two years after the complete performance of said Contract and final settlement thereof.

The Principal, for himself and his successors and assigns, and the Surety (Sureties), for itself and its successors and assigns, do hereby expressly waive any objection that might be interposed as to the right of the City to require a bond containing the foregoing provisions, and they do hereby further expressly waive any defense which they or either of them might interpose to an action brought hereon by any person, firm or corporation, including subcontractors, materialmen and third persons, for work, labor, services, supplies or material performed rendered, or furnished as aforesaid upon the ground that there is no law authorizing the City to require the foregoing provisions to be placed in this bond.

And the Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties), and its bonds shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or of the said Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any part thereof, or of any Work to be performed, or any moneys due to become due thereunder and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, Subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done or in relation to said Principal.

**Payment Bond (Pages 98 to 101): Use for any contract for which a Payment Bond is required.**

PAYMENT BOND (Page 3)

IN WITNESS HEREOF, 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 June, 2016.

(Seal)

**National Environmental Safety Company, Inc.(L.S.)**

Principal

By: 

(Seal)

**Fidelity and Deposit Company of Maryland**

Surety

By:   
**Wayne D. Nowland, 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 a duly authorized officer, agent, or attorney-in-fact.

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

Payment Bond (Pages 98 to 101): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 4)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of NY County of Queens ss:

On this 27 day <sup>J</sup> of June, 2016 before me personally came Mark Canellos to me known, who, being by me duly sworn did depose and say that he resides at

2440 Littleneck Blvd Bayside NY 11360 that he is the V.P 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.

Jamie Rivera  
Notary Public or Commissioner of Deeds  
JAMIE RIVERA  
Notary Public - State of New York  
No. 01R16245854  
Bronx County  
Comm. Exp. August 8, 2019

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ before me personally appeared \_\_\_\_\_ to me known, and known to me to be one of the members of the firm of

\_\_\_\_\_ described in and who executed the foregoing instrument; and he acknowledged to me that he executed the same as and for the act and deed of said firm.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ before me personally appeared \_\_\_\_\_ to me known, and known to me to be the person described in and who executed the foregoing instrument; and acknowledged that he executed the same.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

\* \* \* \* \*

Affix Acknowledgments and Justification of Sureties

ACKNOWLEDGMENT OF SURETY

STATE OF NEW YORK

ss:

COUNTY OF SUFFOLK

On this **23rd** day of **June, 2016**, before me personally came **Wayne D. Nowland**, to me known, who, being by me duly sworn, did depose and say that (s)he is an Attorney-In-Fact of **Fidelity and Deposit Company of Maryland** the corporation described in and which executed the within instrument; that (s)he knows the corporate seal of said corporation; that the seal affixed to the within instrument is such corporate seal, and that (s)he signed and said instrument and affixed the said seal as Attorney-In-Fact by authority of the Board of Directors of said corporation and by authority of this office under the Standing Resolutions thereof.

My commission expires 2/8/2020

  
Notary Public

MATTHEW P KELLY  
NOTARY PUBLIC-STATE OF NEW YORK  
NO 01KE6336557  
QUALIFIED IN NASSAU COUNTY  
MY COMMISSION EXPIRES 02-08-2020

**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND  
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **MICHAEL BOND, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Susan P. HAMMEL and Wayne D. NOWLAND, both of MELVILLE, New York, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 3rd day of May, A.D. 2016.

**ATTEST:**

**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: *Eric D. Barnes*

*Secretary  
Eric D. Barnes*

*Michael Bond*

*Vice President  
Michael Bond*

State of Maryland  
County of Baltimore

On this 3rd day of May, A.D. 2016, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **MICHAEL BOND, Vice President, and ERIC D. BARNES, Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, depose and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

*Constance A. Dunn*

Constance A. Dunn, Notary Public  
My Commission Expires: July 9, 2019



**FIDELITY AND DEPOSIT COMPANY**

OF MARYLAND

600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

**Statement of Financial Condition**

As Of December 31, 2015

**ASSETS**

Bonds .....	\$ 142,878,497
Stocks .....	22,315,096
Cash and Short Term Investments.....	337,835
Reinsurance Recoverable .....	24,731,651
Other Accounts Receivable.....	19,935,844
<b>TOTAL ADMITTED ASSETS .....</b>	<b>\$ 210,198,923</b>


**LIABILITIES, SURPLUS AND OTHER FUNDS**

Reserve for Taxes and Expenses.....	\$ 46,436
Ceded Reinsurance Premiums Payable .....	40,456,309
Securities Lending Collateral Liability .....	0
<b>TOTAL LIABILITIES .....</b>	<b>\$ 40,502,745</b>
Capital Stock, Paid Up .....	\$ 5,000,000
Surplus .....	164,696,178
Surplus as regards Policyholders.....	169,696,178
<b>TOTAL .....</b>	<b>\$ 210,198,923</b>

Securities carried at \$57,996,983 in the above statement are deposited with various states as required by law.

Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of market quotations for all bonds and stocks owned, the Company's total admitted assets at December 31, 2015 would be \$212,137,795 and surplus as regards policyholders \$171,635,049.

I, DENNIS F. KERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2015.

  
 \_\_\_\_\_  
 Corporate Secretary

State of Illinois  
 City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois, in the City of Schaumburg, this 15th day of March, 2016.

  
 \_\_\_\_\_  
 Notary Public





Performance Bond #2 (Pages 94 to 97): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page 1)

PERFORMANCE BOND #2

KNOW ALL PERSONS BY THESE PRESENTS, That we, \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

hereinafter referred to as the "Principal", and \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns, in the penal sum of

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(\$ \_\_\_\_\_) Dollars, lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the City from all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making good any such default and shall protect the said City of New York against, and pay any and all amounts, damages, cost and judgments which may or shall be recovered against said City or its officers or agents or which the said City of New York may be called upon to pay any person or corporation by reason of any damages arising or growing out of the Principal's default of the Contract, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the City that the City has determined that the Principal is in default of the Contract, to either (1) pay the full amount of the above penal sum in complete discharge and exoneration of this bond and of all the liabilities of the Surety relating to this bond, or (2) fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof. The Surety (Sureties) further agrees, at its option, either to tender the penal sum or to commence and diligently perform the Work specified in the Contract, including physical site work, within twenty-five (25) business days after written notice thereof from the City and to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to commence and to complete all Work as provided herein.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or to the said Contract or the Work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any Work to be performed or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal.

**Performance Bond #2 (Pages 94 to 97): Use if the total contract price is more than \$5 Million.**

PERFORMANCE BOND #2 (Page 3)

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

(Seal) \_\_\_\_\_ (L.S.)  
Principal

By: \_\_\_\_\_

(Seal) \_\_\_\_\_  
Surety

By: \_\_\_\_\_

(Seal) \_\_\_\_\_  
Surety

By: \_\_\_\_\_

(Seal) \_\_\_\_\_  
Surety

By: \_\_\_\_\_

(Seal) \_\_\_\_\_  
Surety

By: \_\_\_\_\_

(Seal) \_\_\_\_\_  
Surety

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

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

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ before me personally came \_\_\_\_\_ to me known, who, being by me duly sworn did depose and say that he/she resides at \_\_\_\_\_; that he/she is the \_\_\_\_\_ of \_\_\_\_\_ the corporation described in and which executed the foregoing instrument; and that he signed his 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 (Pages 98 to 101): Use for any contract for which a Payment Bond is required.**

PAYMENT BOND (Page 1)

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, That we, \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

hereinafter referred to as the "Principal", and \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns, in the penal sum of

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(\$ \_\_\_\_\_) Dollars, lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns 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

**Payment Bond (Pages 98 to 101): Use for any contract for which a Payment Bond is required.**

PAYMENT BOND (Page 2)

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 in full force and effect.

This bond is subject to the following additional conditions, limitations and agreements:

(a) The Principal and Surety (Sureties) agree that this bond shall be for the benefit of any materialmen or laborer having a just claim, as well as the City itself.

(b) All persons who have performed labor, rendered services or furnished materials and supplies, as aforesaid, shall have a direct right of action against the Principal and his, its or their successors and assigns, and the Surety (Sureties) herein, or against either or both or any of them and their successors and assigns. Such persons may sue in their own name, and may prosecute the suit to judgment and execution without the necessity of joining with any other persons as party plaintiff.

(c) The Principal and Surety (Sureties) agree that neither of them will hold the City liable for any judgment for costs of otherwise, obtained by either or both of them against a laborer or materialman in a suit brought by either a laborer or materialman under this bond for moneys allegedly due for performing work or furnishing material.

(d) The Surety (Sureties) or its successors and assigns shall not be liable for any compensation recoverable by an employee or laborer under the Workmen's Compensation Law.

(e) In no event shall the Surety (Sureties), or its successors or assigns, be liable for a greater sum than the penalty of this bond or be subject to any suit, action or proceeding hereon that is instituted by any person, firm, or corporation hereunder later than two years after the complete performance of said Contract and final settlement thereof.

The Principal, for himself and his successors and assigns, and the Surety (Sureties), for itself and its successors and assigns, do hereby expressly waive any objection that might be interposed as to the right of the City to require a bond containing the foregoing provisions, and they do hereby further expressly waive any defense which they or either of them might interpose to an action brought hereon by any person, firm or corporation, including subcontractors, materialmen and third persons, for work, labor, services, supplies or material performed rendered, or furnished as aforesaid upon the ground that there is no law authorizing the City to require the foregoing provisions to be placed in this bond.

And the Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties), and its bonds shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or of the said Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any part thereof, or of any Work to be performed, or any moneys due to become due thereunder and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, Subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done or in relation to said Principal.

**Payment Bond (Pages 98 to 101): Use for any contract for which a Payment Bond is required.**

PAYMENT BOND (Page 3)

IN WITNESS HEREOF, 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 \_\_\_\_\_, \_\_\_\_\_.

(Seal) \_\_\_\_\_ (L.S.)  
Principal

By: \_\_\_\_\_

(Seal) \_\_\_\_\_  
Surety

By: \_\_\_\_\_

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

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

Payment Bond (Pages 98 to 101): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 4)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ before me personally came \_\_\_\_\_ to me known, who, being by me duly sworn did depose and say that he resides at \_\_\_\_\_ that he is the \_\_\_\_\_ 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.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ before me personally appeared \_\_\_\_\_ to me known, and known to me to be one of the members of the firm of \_\_\_\_\_ described in and who executed the foregoing instrument; and he acknowledged to me that he executed the same as and for the act and deed of said firm.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ before me personally appeared \_\_\_\_\_ to me known, and known to me to be the person described in and who executed the foregoing instrument; and acknowledged that he executed the same.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

\* \* \* \* \*

Affix Acknowledgments and Justification of Sureties



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OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

LABOR LAW §220 PREVAILING WAGE SCHEDULE

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 Labor Law §220 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 contracts.

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 New York State 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 works contracts. Contractors are advised to review the Comptroller's Prevailing Wage Schedule before bidding on public works contracts. Contractors with questions concerning trade classifications, prevailing rates or prevailing practices with respect to public works 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 works contracts that have already been awarded may be directed to the Bureau of Labor Law's Classification Unit by calling (212) 669-7974. All callers must have the agency name and contract registration number available when calling with questions on public works contracts. Please direct all other compliance issues to: Bureau of Labor Law, Attn: Wasyl Kinach, P.E., Office of the Comptroller, 1 Centre Street, Room 1122, New York, N.Y. 10007; Fax (212) 669-4002.

The appropriate schedule of prevailing wages and benefits must be posted at all public work sites pursuant to Labor Law §220 (3-a) (a).

This schedule is applicable to work performed during the effective period, unless otherwise noted. Changes to this schedule are published on our web site [www.comptroller.nyc.gov](http://www.comptroller.nyc.gov). 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 [www.comptroller.nyc.gov](http://www.comptroller.nyc.gov).

The Comptroller's Office has attempted to include all overtime, shift and night differential, Holiday, Saturday, Sunday or other premium time work. However, this schedule does not set forth every prevailing practice with respect to such rates with which employers must comply. All such practices are nevertheless part of the employer's prevailing wage obligation and contained in the collective bargaining agreements of the prevailing wage unions. These collective bargaining agreements are available for inspection by appointment. Requests for appointments may be made by calling (212) 669-4443, Monday through Friday between the hours of 9 a.m. and 5 p.m.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Prevailing rates and ratios for apprentices are attached to this schedule in the Appendix. 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 employed on a public work project. Workers who are not journey persons or not registered apprentices pursuant to Labor Law §220 (3-e) may not be substituted for apprentices and must be paid as journey persons.

Public Work construction, reconstruction, demolition, excavation, rehabilitation, repair, renovation, alteration, or improvement contracts 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 <http://www.nyc.gov/html/mocs/html/vendors/pla.shtml>.

All the provisions of Labor Law section 220 remain applicable to PLA work including, but not limited to, the enforcement of prevailing wage requirements by the Comptroller; 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 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 benefits and wage supplements which cost the employer no less than the prevailing supplemental benefits rate in total.

Particular attention should be given to the supplemental benefits requirement. Although in most instances the payment or provision for supplemental benefits is for each hour worked, some classifications require the payment or provision of supplemental benefits for each hour paid. Consequently, some prevailing practices require benefits to be purchased at the overtime, shift differential, Holiday, Saturday, Sunday or other premium time rate.

**Benefits are paid for EACH HOUR WORKED unless otherwise noted.**

Wasył Kinach, P.E.  
Director of Classifications  
Bureau of Labor Law

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§220 PREVAILING WAGE SCHEDULE

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## **ASBESTOS HANDLER**

(Hazardous Material; Disturbs, removes, encapsulates, repairs, or encloses friable asbestos material)

### **Asbestos Handler**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$36.00**

Supplemental Benefit Rate per Hour: **\$15.95**

### **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 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)

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## **BLASTER**

### **Blaster**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$46.89**

Supplemental Benefit Rate per Hour: **\$41.19**

### **Blaster (Hydraulic)**

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$47.71  
Supplemental Benefit Rate per Hour: \$41.19

**Blaster - Trac Drill Hydraulic**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$42.25  
Supplemental Benefit Rate per Hour: \$41.19

**Blaster - Wagon: Air Trac: Quarry Bar: Drillrunners**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$41.46  
Supplemental Benefit Rate per Hour: \$41.19

**Blaster - Operators of Jack Hammers**

Chippers: Spaders: Concrete Breakers: and all other pneumatic tools of like usage: Walk Behind Self Propelled Hydraulic Asphalt and Concrete Breakers: Hydro (Water) Demolition

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$40.42  
Supplemental Benefit Rate per Hour: \$41.19

**Blaster - Powder Carriers**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$36.53  
Supplemental Benefit Rate per Hour: \$41.19

**Blaster - Hydraulic Trac Drill Chuck Tender**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$35.25  
Supplemental Benefit Rate per Hour: \$41.19

**Blaster - Chuck Tender & Nipper**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$34.50  
Supplemental Benefit Rate per Hour: \$41.19

**Blaster - Magazine Keepers: (Watch Person)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$20.68  
Supplemental Benefit Rate per Hour: \$41.19

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

## Overtime Description

### Magazine Keepers:

Time and one half for work performed in excess of forty (40) hours per week and for work performed on Saturdays, Sundays and Holidays.

### All Other Employees:

Time and one-half for the first eight hours of work on Saturday and for Make-up Time. Double time for all hours over eight Monday through Friday (except make-up hours) and for all hours worked on Sunday and Holidays.

## Overtime

Double time 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

Presidential Election Day

Thanksgiving Day

Christmas Day

## Paid Holidays

None

## Shift Rates

A single shift shall be 8 hours plus an unpaid lunch, starting at 8:00 A.M (or between 6:00 A.M. and 10:00 A.M. on weekdays). When two (2) shifts are employed, each shift shall be 8 hours plus ½ hour unpaid lunch. When three (3) shifts are employed, each shift will work seven and one-half (7 ½) hours, but will be paid for eight (8) hours, since only one-half (½) hour is allowed for mealtime. When two (2) or more shifts are employed, single time will be paid for each shift. The first 8 hours of any and all work performed Monday through Friday inclusive of any off-shift shall be at the single time rate.

(Local #29)

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## BOILERMAKER

### Boilermaker

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$51.56

Supplemental Benefit Rate per Hour: \$41.69

Supplemental Note: For time and one half overtime - \$61.94 For double overtime - \$82.18



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

### 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

When shifts are required, the first shift shall work eight (8) hours at the regular straight-time hourly rate. The second shift shall work seven and one-half (7 ½) hours and receive eight hours at the regular straight time hourly rate plus twenty-five cents (\$0.25) per hour. The third shift shall work seven (7) hours and receive eight hours at the regular straight time hourly rate plus fifty cents (\$0.50) per hour. A thirty (30) minute lunch period shall not be considered as time worked. Work in excess of the above shall be paid overtime at the appropriate new construction work or repair work overtime wage and supplemental benefit hourly rate.

(Local #5)

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## BRICKLAYER

### Bricklayer

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$48.91**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$28.03

**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.

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

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

**Paid Holidays**

None

**Shift Rates**

Overtime rates to be paid outside the regular scheduled work day.

(Bricklayer District Council)

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**CARPENTER - BUILDING COMMERCIAL**

**Building Commercial**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$50.50

Supplemental Benefit Rate per Hour: \$45.88

**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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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.

(Carpenters District Council)

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**CARPENTER - HEAVY CONSTRUCTION WORK**  
(Construction of Engineering Structures and Building Foundations)

**Heavy Construction Work**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$50.50

Supplemental Benefit Rate per Hour: \$46.65

**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

Christmas Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**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)

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**CARPENTER - SIDEWALK SHED, SCAFFOLD AND HOIST**

**Carpenter - Hod Hoist**

(Assisted by Mason Tender)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$49.60

Supplemental Benefit Rate per Hour: \$43.00

**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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

(Carpenters District Council)

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## **CEMENT & CONCRETE WORKER**

### **Cement & Concrete Worker**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$42.48**

Supplemental Benefit Rate per Hour: **\$26.57**

Supplemental Note: \$29.32 on Saturdays; \$32.07 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)

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## CEMENT MASON

### Cement Mason

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$38.88**

Supplemental Benefit Rate per Hour: **\$39.80**

Supplemental Note: For time and one half overtime - \$49.05; For double overtime - \$58.30

### 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.

### 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 an off shift day, (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. Four Days a week at Ten (10)hour day.

(Local #780)

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## CORE DRILLER

### Core Driller

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$36.82**

Supplemental Benefit Rate per Hour: **\$22.69**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**Core Driller Helper**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$29.44**  
Supplemental Benefit Rate per Hour: **\$22.69**

**Core Driller Helper(Third year in the industry)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$26.50**  
Supplemental Benefit Rate per Hour: **\$22.69**

**Core Driller Helper (Second year in the industry)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$23.55**  
Supplemental Benefit Rate per Hour: **\$22.69**

**Core Driller Helper (First year in the industry)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$20.61**  
Supplemental Benefit Rate per Hour: **\$22.69**

**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**

The shift day shall be the continuous eight and one-half (8½) hours from 6:00 A.M. to 2:30 P.M. and from 2:30 P.M. to 11:00 P.M., including one-half (½) hour of employees regular rate of pay for lunch. 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 seventy-five cents (\$0.75) 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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

(Carpenters District Council)

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## DERRICKPERSON AND RIGGER

### Derrick Person & Rigger

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$44.84**

Supplemental Benefit Rate per Hour: **\$49.28**

Supplemental Note: The above supplemental rate applies for work performed in Manhattan, Bronx, Brooklyn and Queens. \$50.70 - For work performed in Staten Island.

### 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. Deduct \$1.42 from the Staten Island hourly benefits rate before computing overtime.

### 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)

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## DIVER

### Diver (Marine)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$63.82**



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: **\$46.65**

**Diver Tender (Marine)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$45.47**

Supplemental Benefit Rate per Hour: **\$46.65**

**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

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)

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**DOCKBUILDER - PILE DRIVER**

**Dockbuilder - Pile Driver**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$50.50**

Supplemental Benefit Rate per Hour: **\$46.65**

**Overtime**

Time and one half the regular rate after an 8 hour day.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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)

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## DRIVER: TRUCK (TEAMSTER)

### Driver - Dump Truck

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$39.53

Supplemental Benefit Rate per Hour: \$41.59

Supplemental Note: Over 40 hours worked: time and one half rate \$16.94, double time rate \$22.58

### Driver - Tractor Trailer

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$39.50

Supplemental Benefit Rate per Hour: \$43.35

Supplemental Note: For over 40 hours worked: at time and one half - \$16.65; at double time - \$22.20

### Driver - Euclid & Turnapull Operator

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$40.06

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
\$220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: **\$43.35**

Supplemental Note: Over 40 hours worked: time and one half rate \$16.65 double time rate \$22.20

### 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 single shift work commencing between 6:00 P.M. and 5:00 A.M. shall work eight and one half hours allowing for one half hour for lunch and receive 9 hours pay for 8 hours of work.

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### Driver Redi-Mix (Sand & Gravel)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$36.30**

Supplemental Benefit Rate per Hour: **\$40.02**

Supplemental Note: Over 40 hours worked: time and one half rate \$13.90, double time rate \$18.53

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**Overtime Description**

For Paid Holidays: Employees working two (2) days in the calendar week in which the holiday falls are to paid for these holidays, provided they shape each remaining workday during that calendar 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).

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)

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**ELECTRICIAN**

(Including all low voltage cabling carrying data; video; and voice in combination with data and or video.)

**Electrician "A" (Regular Day)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$54.00  
Supplemental Benefit Rate per Hour: \$50.03

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**Electrician "A" (Regular Day Overtime)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$81.00  
Supplemental Benefit Rate per Hour: \$53.41

**Electrician "A" (Day Shift)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$54.00  
Supplemental Benefit Rate per Hour: \$50.03

**Electrician "A" (Day Shift Overtime After 8 hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$81.00  
Supplemental Benefit Rate per Hour: \$53.41

**Electrician "A" (Swing Shift)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$63.36  
Supplemental Benefit Rate per Hour: \$56.94

**Electrician "A" (Swing Shift Overtime After 7.5 hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$95.04  
Supplemental Benefit Rate per Hour: \$60.91

**Electrician "A" (Graveyard Shift)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$70.97  
Supplemental Benefit Rate per Hour: \$62.78

**Electrician "A" (Graveyard Shift Overtime After 7 hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$106.46  
Supplemental Benefit Rate per Hour: \$67.23

**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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

### **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**

When so elected by the Employer, one or more shifts of at least five days duration may be scheduled as follows:  
Day Shift: 8:00 am to 4:30 pm, Swing Shift 4:30 pm to 12:30 am, Graveyard Shift: 12:30 am to 8:00 am.

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 \$24.39.

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### **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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$27.50**

Supplemental Benefit Rate per Hour: **\$20.82**

First and Second Year "M" Wage Rate Per Hour: \$23.00

First and Second Year "M" Supplemental Rate: \$18.56

### **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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$41.25**

Supplemental Benefit Rate per Hour: **\$22.54**

First and Second Year "M" Wage Rate Per Hour: \$34.50

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

First and Second Year "M" Supplemental Rate: \$20.00

**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)

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**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: 7/1/2015 - 3/9/2016

Wage Rate per Hour: \$31.40

Supplemental Benefit Rate per Hour: \$14.76

Supplemental Note: \$13.26 only after 8 hours worked in a day

Effective Period: 3/10/2016 - 6/30/2016

Wage Rate per Hour: \$32.00

Supplemental Benefit Rate per Hour: \$15.47

Supplemental Note: \$13.97 only after 8 hours worked in a day

**Overtime Description**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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.  
Double time 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 8:00 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)

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**ELECTRICIAN-STREET LIGHTING WORKER**

**Electrician - Electro Pole Electrician**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$54.00  
Supplemental Benefit Rate per Hour: \$51.86

**Electrician - Electro Pole Foundation Installer**



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$40.93  
Supplemental Benefit Rate per Hour: \$39.46

**Electrician - Electro Pole Maintainer**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$35.05  
Supplemental Benefit Rate per Hour: \$35.51

**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)

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**ELEVATOR CONSTRUCTOR**

**Elevator Constructor**

Effective Period: 7/1/2015 - 3/16/2016  
Wage Rate per Hour: \$59.55  
Supplemental Benefit Rate per Hour: \$31.07

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Effective Period: 3/17/2016 - 6/30/2016

Wage Rate per Hour: **\$60.96**

Supplemental Benefit Rate per Hour: **\$32.67**

### Overtime Description

For New Construction: work performed after 7 or 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)

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## ELEVATOR REPAIR & MAINTENANCE

### Elevator Service/Modernization Mechanic

Effective Period: 7/1/2015 - 3/16/2016

Wage Rate per Hour: **\$46.92**

Supplemental Benefit Rate per Hour: **\$30.91**

Effective Period: 3/17/2016 - 6/30/2016

Wage Rate per Hour: **\$47.91**

Supplemental Benefit Rate per Hour: **\$32.51**

### Overtime Description

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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)

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## ENGINEER

### Engineer - Heavy Construction Operating Engineer I

Cherry pickers 20 tons and over and Loaders (rubber tired and/or tractor type with a manufacturer's minimum rated capacity of six cubic yards and over).

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$64.31

Supplemental Benefit Rate per Hour: \$34.25

Supplemental Note: \$61.60 on overtime

Shift Wage Rate: \$102.90

### Engineer - Heavy Construction Operating Engineer II

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$62.40**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

Shift Wage Rate: **\$99.84**

### 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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$59.20**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

Shift Wage Rate: **\$94.72**

### 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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$62.11**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

Shift Wage Rate: **\$99.38**

### Engineer - Heavy Construction Maintenance Engineer II

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
\$220 PREVAILING WAGE SCHEDULE

**On Base Mounted Tower Cranes**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$81.54**  
Supplemental Benefit Rate per Hour: **\$34.25**  
Supplemental Note: \$61.60 on overtime  
Shift Wage Rate: **\$130.46**

**Engineer - Heavy Construction Maintenance Engineer III**

**On Generators, Light Towers**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$41.04**  
Supplemental Benefit Rate per Hour: **\$34.25**  
Supplemental Note: \$61.60 on overtime  
Shift Wage Rate: **\$65.66**

**Engineer - Heavy Construction Maintenance Engineer IV**

**On Pumps and Mixers including mud sucking**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$42.11**  
Supplemental Benefit Rate per Hour: **\$34.25**  
Supplemental Note: \$61.60 on overtime  
Shift Wage Rate: **\$67.38**

**Engineer - Heavy Construction Oilers I**

**Gradalls, Cold Planer Grader, Concrete Pumps, Driving Truck Cranes, Driving and Operating Fuel and Grease Trucks.**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$56.02**  
Supplemental Benefit Rate per Hour: **\$34.25**  
Supplemental Note: \$61.60 on overtime  
Shift Wage Rate: **\$89.63**

**Engineer - Heavy Construction Oilers II**

**All gasoline, electric, diesel or air operated Shovels, Draglines, Backhoes, Keystones, Pavers, Gunite Machines, Battery of Compressors, Crawler Cranes, two-person Trenching Machines.**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$38.79**  
Supplemental Benefit Rate per Hour: **\$34.25**  
Supplemental Note: \$61.60 on overtime  
Shift Wage Rate: **\$62.06**

## Engineer - Steel Erection Maintenance Engineers

Derrick, Travelers, Tower, Crawler Tower and Climbing Cranes

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$59.77**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: **\$61.60** on overtime

Shift Wage Rate: **\$95.63**

## Engineer - Steel Erection Oiler I

On a Truck Crane

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$55.95**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: **\$61.60** on overtime

Shift Wage Rate: **\$89.52**

## Engineer - Steel Erection Oiler II

On a Crawler Crane

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$42.64**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: **\$61.60** on overtime

Shift Wage Rate: **\$68.22**

## **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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Thanksgiving Day  
Day after Thanksgiving  
Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

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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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$56.88**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

**Engineer - Building Work Maintenance Engineers II**

On Pumps, Generators, Mixers and Heaters

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$44.22**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$54.08**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

**Engineer - Building Work Oilers II**

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

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$40.21**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

## 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

Off Shift: double time the regular hourly rate.

(Local #15)

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## ENGINEER - CITY SURVEYOR AND CONSULTANT

### Party Chief

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$37.04**  
Supplemental Benefit Rate per Hour: **\$18.60**  
Supplemental Note: Overtime Benefit Rate - \$25.45 per hour (time & one half) \$32.30 per hour (double time).

### Instrument Person

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$30.59**  
Supplemental Benefit Rate per Hour: **\$18.60**  
Supplemental Note: Overtime Benefit Rate - \$25.45 per hour (time & one half) \$32.30 per hour (double time).

### Rodperson



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$26.52

Supplemental Benefit Rate per Hour: \$18.60

Supplemental Note: Overtime Benefit Rate - \$25.45 per hour (time & one half) \$32.30 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)

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## ENGINEER - FIELD (BUILDING CONSTRUCTION)

(Construction of Building Projects, Concrete Superstructures, etc.)

### Field Engineer - BC Party Chief

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$60.77

Supplemental Benefit Rate per Hour: \$32.40

Supplemental Note: Overtime Benefit Rate - \$45.28 per hour (time & one half) \$58.15 per hour (double time).

### Field Engineer - BC Instrument Person

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$47.20

Supplemental Benefit Rate per Hour: \$32.40

Supplemental Note: Overtime Benefit Rate - \$45.28 per hour (time & one half) \$58.15 per hour (double time).

### Field Engineer - BC Rodperson

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$30.49

Supplemental Benefit Rate per Hour: \$32.40

Supplemental Note: Overtime Benefit Rate - \$45.28 per hour (time & one half) \$58.15 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)

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## ENGINEER - FIELD (HEAVY CONSTRUCTION)

(Construction of Roads, Tunnels, Bridges, Sewers, Building Foundations, Engineering Structures etc.)

### Field Engineer - HC Party Chief

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$66.43

Supplemental Benefit Rate per Hour: \$32.40

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 per hour (double time).

### Field Engineer - HC Instrument Person

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$48.82

Supplemental Benefit Rate per Hour: \$32.40

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 per hour (double time).

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**Field Engineer - HC Rodperson**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$40.99**

Supplemental Benefit Rate per Hour: **\$32.40**

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 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)

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**ENGINEER - FIELD (STEEL ERECTION)**

**Field Engineer - Steel Erection Party Chief**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$62.26**

Supplemental Benefit Rate per Hour: **\$32.40**

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 per hour (double time).

**Field Engineer - Steel Erection Instrument Person**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$48.57**

Supplemental Benefit Rate per Hour: **\$32.40**

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 per hour (double time).

**Field Engineer - Steel Erection Rodperson**

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$32.61**

Supplemental Benefit Rate per Hour: **\$32.40**

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 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)

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## ENGINEER - OPERATING

### Operating Engineer - Road & Heavy Construction I

Back Filling Machines, Cranes, Mucking Machines and Dual Drum Paver.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$71.75**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: \$55.10 overtime hours

Shift Wage Rate: **\$114.80**

### Operating Engineer - Road & Heavy Construction II

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

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$74.29**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
\$220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$30.40  
Supplemental Note: \$55.10 overtime hours  
Shift Wage Rate: \$118.86

**Operating Engineer - Road & Heavy Construction III**

Mine Hoists, Cranes, etc. (Used as Mine Hoists)

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$76.67  
Supplemental Benefit Rate per Hour: \$30.40  
Supplemental Note: \$55.10 overtime hours  
Shift Wage Rate: \$122.67

**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: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$74.84  
Supplemental Benefit Rate per Hour: \$30.40  
Supplemental Note: \$55.10 overtime hours  
Shift Wage Rate: \$119.74

**Operating Engineer - Road & Heavy Construction V**

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

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$73.36  
Supplemental Benefit Rate per Hour: \$30.40  
Supplemental Note: \$55.10 overtime hours  
Shift Wage Rate: \$117.38

**Operating Engineer - Road & Heavy Construction VI**

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

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$69.69  
Supplemental Benefit Rate per Hour: \$30.40  
Supplemental Note: \$55.10 overtime hours  
Shift Wage Rate: \$111.50

**Operating Engineer - Road & Heavy Construction VII**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$56.25**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: **\$55.10** overtime hours  
Shift Wage Rate: **\$90.00**

**Operating Engineer - Road & Heavy Construction VIII**

Utility Compressors

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$43.63**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: **\$55.10** overtime hours  
Shift Wage Rate: **\$55.03**

**Operating Engineer - Road & Heavy Construction IX**

Horizontal Boring Rig

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$66.26**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: **\$55.10** overtime hours  
Shift Wage Rate: **\$106.02**

**Operating Engineer - Road & Heavy Construction X**

Elevators (manually operated as personnel hoist).

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$60.89**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: **\$55.10** overtime hours  
Shift Wage Rate: **\$97.42**

**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: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$47.28**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: **\$55.10** overtime hours  
Shift Wage Rate: **\$75.65**

**Operating Engineer - Road & Heavy Construction XII**

All Drills and Machines of a similar nature.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$70.42**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: **\$55.10** overtime hours  
Shift Wage Rate: **\$112.67**

**Operating Engineer - Road & Heavy Construction XIII**

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

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$68.19**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: **\$55.10** overtime hours  
Shift Wage Rate: **\$109.10**

**Operating Engineer - Road & Heavy Construction XIV**

Concrete Mixer

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$65.20**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: **\$55.10** overtime hours  
Shift Wage Rate: **\$104.32**

**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: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$43.91**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: **\$55.10** overtime hours  
Shift Wage Rate: **\$70.26**

**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: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$62.25**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: **\$55.10** overtime hours  
Shift Wage Rate: **\$99.60**

### Operating Engineer - Road & Heavy Construction XVII

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

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$62.74**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$100.38**

### Operating Engineer - Road & Heavy Construction XVIII

Tower Crane

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$90.09**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$144.14**

### Operating Engineer - Paving I

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

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$69.69**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$111.50**

### Operating Engineer - Paving II

Asphalt Roller

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$67.87**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$108.59**

### Operating Engineer - Paving III

Asphalt Plants

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$57.40**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$91.84**



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**Operating Engineer - Concrete I**

Cranes

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$74.51**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

**Operating Engineer - Concrete II**

Compressors

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$44.25**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

**Operating Engineer - Concrete III**

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

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$59.51**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

**Operating Engineer - Steel Erection I**

Three Drum Derricks

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$77.40**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$123.84**

**Operating Engineer - Steel Erection II**

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

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$74.37**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$118.99**

**Operating Engineer - Steel Erection III**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**Compressors, Welding Machines.**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$44.09**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: \$55.10 overtime hours  
Shift Wage Rate: **\$70.54**

**Operating Engineer - Steel Erection IV**

Compressors - Not Combined with Welding Machine.

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$41.98**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: \$55.10 overtime hours  
Shift Wage Rate: **\$67.17**

**Operating Engineer - Building Work I**

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

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$61.27**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: \$55.10 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: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$45.85**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: \$55.10 overtime hours

**Operating Engineer - Building Work III**

Double Drum

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$69.76**  
Supplemental Benefit Rate per Hour: **\$30.40**  
Supplemental Note: \$55.10 overtime hours

**Operating Engineer - Building Work IV**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$73.91**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: \$55.10 overtime hours

**Operating Engineer - Building Work V**

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$68.09**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: \$55.10 overtime hours

**Operating Engineer - Building Work VI**

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$67.37**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: \$55.10 overtime hours

**Operating Engineer - Building Work VII**

Rack & Pinion and House Cars

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$53.54**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: \$55.10 overtime hours

For New House Car projects Wage Rate per Hour **\$42.70**

**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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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

### Shift Rates

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)

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## 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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$50.50**

Supplemental Benefit Rate per Hour: **\$45.88**

### 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  
Presidential Election Day  
Thanksgiving Day  
Day after Thanksgiving  
Christmas Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

### **Paid Holidays**

1/2 day on Christmas Eve if work is performed in the A.M.  
1/2 day on New Year's Eve if work is performed in the A.M.

### **Shift Rates**

Two shifts may be utilized with the first shift working 8:00 A.M. to the end of the shift at the straight time of pay. The second shift will receive one hour at double time rate for the last hour of the shift. (eight for seven, nine for eight).

(Carpenters District Council)

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## **GLAZIER**

(New Construction, Remodeling, and Alteration)

### **Glazier**

Effective Period: 7/1/2015 - 10/31/2015

Wage Rate per Hour: **\$43.35**

Supplemental Benefit Rate per Hour: **\$36.59**

Supplemental Note: Supplemental Benefit Overtime Rate: **\$45.34**

Effective Period: 11/1/2015 - 6/30/2016

Wage Rate per Hour: **\$43.95**

Supplemental Benefit Rate per Hour: **\$36.84**

Supplemental Note: Supplemental Benefit Overtime Rate: **\$45.59**

### **Overtime Description**

An optional 8th hour can be worked at straight time rate. If 9th hour is worked, then both hours or more (8th & 9th or more) will be at the double time rate of pay.

### **Overtime**

Double time the regular rate after a 7 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

### **Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Day after Thanksgiving

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Christmas Day

**Paid Holidays**

None

**Shift Rates**

Shifts shall be any 7 hours beyond 4:00 P.M. for which the glazier shall receive 8 hours pay for 7 hours worked.

(Local #1281)

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**GLAZIER - REPAIR & MAINTENANCE**

(For the Installation of Glass - All repair and maintenance work on a particular building, whenever performed, where the total cumulative contract value is under \$105,000. Except where enumerated (i.e. plate glass windows) does not apply to non-residential buildings.)

**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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$23.68

Supplemental Benefit Rate per Hour: \$19.54

**Overtime**

Time and one half the regular rate after an 8 hour day.

Double time the regular rate for Sunday.

Time and one half the regular hourly rate after 40 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

(Local #1281)

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## HEAT AND FROST INSULATOR

### Heat & Frost Insulator

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$57.38

Supplemental Benefit Rate per Hour: \$37.41

### Overtime Description

Double time shall be paid for supplemental benefits during overtime work.  
8th hour paid at time and one half.

### 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

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.

Off hour work in occupied or retail buildings may be worked on weekdays with an increment of \$1.00 per hour and eight hours pay for seven (7) hours worked. Double time will apply for over seven (7) hours worked on weekdays, weekends or holidays.

(Local #12)

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## **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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$35.52**

Supplemental Benefit Rate per Hour: **\$26.86**

### **House Wrecker - Tier B**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$24.90**

Supplemental Benefit Rate per Hour: **\$19.88**

### **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)

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## **IRON WORKER - ORNAMENTAL**

### **Iron Worker - Ornamental**



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$43.20**

Supplemental Benefit Rate per Hour: **\$47.67**

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

For off shift work - 8 hours pay for 7 hours of work. When two or three shifts are employed on a job, Monday through Friday, the workday for each shift shall be seven hours and paid for ten and one-half hours at the single time rate. When two or three shifts are worked on Saturday, Sunday or holidays, each shift shall be seven hours and paid fifteen and three-quarters hours.

(Local #580)

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## IRON WORKER - STRUCTURAL

### Iron Worker - Structural

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$48.75**

Supplemental Benefit Rate per Hour: **\$67.34**

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**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.

**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  
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.  
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.

(Local #40 & #361)

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**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: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$40.50

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$36.53

**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

Presidential Election 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)

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**LANDSCAPING**

(Landscaping tasks, as well as tree pruning, tree removing, spraying and maintenance in connection with the planting of street trees and the planting of trees in city parks but not when such activities are performed as part of, or in connection with, other construction or reconstruction projects.)

**Landscaper (Above 6 years experience)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$27.00

Supplemental Benefit Rate per Hour: \$14.55

**Landscaper (3 - 6 years experience)**

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$26.00  
Supplemental Benefit Rate per Hour: \$14.55

**Landscaper (up to 3 years experience)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$23.50  
Supplemental Benefit Rate per Hour: \$14.55

**Groundperson**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$23.50  
Supplemental Benefit Rate per Hour: \$14.55

**Tree Remover / Pruner**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$32.00  
Supplemental Benefit Rate per Hour: \$14.55

**Landscaper Sprayer (Pesticide Applicator)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$22.00  
Supplemental Benefit Rate per Hour: \$14.55

**Watering - Plant Maintainer**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$17.00  
Supplemental Benefit Rate per Hour: \$14.55

**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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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)

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## MARBLE MECHANIC

### Marble Setter

Effective Period: 7/1/2015 - 12/31/2015

Wage Rate per Hour: **\$51.53**

Supplemental Benefit Rate per Hour: **\$35.73**

Effective Period: 1/1/2016 - 6/30/2016

Wage Rate per Hour: **\$51.89**

Supplemental Benefit Rate per Hour: **\$36.62**

### Marble Finisher

Effective Period: 7/1/2015 - 12/31/2015

Wage Rate per Hour: **\$40.53**

Supplemental Benefit Rate per Hour: **\$34.52**

Effective Period: 1/1/2016 - 6/30/2016

Wage Rate per Hour: **\$40.80**

Supplemental Benefit Rate per Hour: **\$35.15**

### Marble Polisher

Effective Period: 7/1/2015 - 12/31/2015

Wage Rate per Hour: **\$36.65**

Supplemental Benefit Rate per Hour: **\$26.63**

Effective Period: 1/1/2016 - 6/30/2016

Wage Rate per Hour: **\$37.02**

Supplemental Benefit Rate per Hour: **\$27.01**

### Overtime Description

Supplemental Benefit contributions are to be made at the applicable overtime rates. Time and one half the regular rate after a 7 hour day or time and one half the regular rate after an 8 hour day - chosen by Employer at the start of the project and then would last for the full duration of the project.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**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  
Veteran's Day  
Thanksgiving Day  
Day after Thanksgiving  
Christmas Day

**Paid Holidays**

None

(Local #7)

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**MASON TENDER**

**Mason Tender**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$36.67

Supplemental Benefit Rate per Hour: \$28.02

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

**Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

New Year's Day  
President's Day  
Memorial Day  
Independence Day  
Labor Day  
Thanksgiving Day  
Christmas Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**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.

(Local #79)

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**MASON TENDER (INTERIOR DEMOLITION WORKER)**

(The erection, building, moving, servicing and dismantling of enclosures, scaffolding, barricades, protection and site safety structures etc., on Interior Demolition jobs.)

**Mason Tender Tier A**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$35.46**

Supplemental Benefit Rate per Hour: **\$22.13**

**Mason Tender Tier B**

On Interior Demolition job sites 33 1/3 % of the employees shall be classified as Tier A Interior Demolition Workers and 66 2/3 % shall be classified as Tier B Interior Demolition Workers; provided that the employer may employ more than 33 1/3 % Tier A Interior Demolition Workers on the job site. Where the number of employees on a job site is not divisible by 3, the first additional employee (above the number of employees divisible by three) shall be a Tier B Interior Demolition Worker, and the second additional employee shall be a Tier A Interior Demolition Worker.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$24.65**

Supplemental Benefit Rate per Hour: **\$16.45**

**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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Labor Day  
Thanksgiving Day  
Christmas Day

**Paid Holidays**

None

(Local #79)

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**METALLIC LATHER**

**Metallic Lather**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$43.63**

Supplemental Benefit Rate per Hour: **\$41.57**

Supplemental Note: Supplemental benefits for overtime are paid at the appropriate overtime rate.

**Overtime Description**

Overtime would be time and one half the regular rate after a seven (7) or eight (8) hours workday, which would be set at the start of the job.

**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  
Washington's Birthday  
Good Friday  
Memorial Day  
Independence Day  
Labor Day  
Columbus Day  
Presidential Election 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**

There shall be either two (2) or three (3) shifts, each shift shall be eight (8) hours with nine (9) hours pay, including one half (1/2) hour for lunch. Off-Hour Start shall commence after 3:30 P.M. and shall conclude by 6:00



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

A.M. The first consecutive seven (7) hours shall be at straight time with a differential of twelve dollars (\$12.00) per hour. Fringes shall be paid at the straight time rate.

(Local #46)

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## MILLWRIGHT

### Millwright

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$49.50

Supplemental Benefit Rate per Hour: \$52.01

### 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.

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

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

The first shift shall receive the straight time rate of pay. The second shift receives the straight time rate of pay plus fifteen (15%) per cent. Members of the second shift shall be allowed one half hour to eat, with this time being included in the hours of the workday established. There must be a first shift to work a second shift. All additional hours worked shall be paid at the time and one-half rate of pay plus fifteen (15%) per cent for weekday hours.

(Local #740)

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## **MOSAIC MECHANIC**

### **Mosaic Mechanic - Mosaic & Terrazzo Mechanic**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$45.91**

Supplemental Benefit Rate per Hour: **\$38.15**

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$48.92 per hour.

### **Mosaic Mechanic - Mosaic & Terrazzo Finisher**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$44.30**

Supplemental Benefit Rate per Hour: **\$38.14**

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$48.91 per hour.

### **Mosaic Mechanic - Machine Operator Grinder**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$44.30**

Supplemental Benefit Rate per Hour: **\$38.14**

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of \$48.91 per hour.

### **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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$41.00**

Supplemental Benefit Rate per Hour: **\$26.37**

Supplemental Note: \$31.00 on overtime

### **Spray & Scaffold / Decorative / Sandblast**

Effective Period: 7/1/2015 - 6/30/2016

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

Supplemental Benefit Rate per Hour: **\$26.37**

Supplemental Note: \$31.00 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)

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## **PAINTER - SIGN**

### **Designer**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$40.30

Supplemental Benefit Rate per Hour: \$7.22

**Journey person**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$37.48

Supplemental Benefit Rate per Hour: \$7.22

**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.

Double time the regular rate for work on the following holiday(s).

**Paid Holidays**

New Year's Day

Martin Luther King Jr. Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Two (2) additional holidays as floating holidays

(Local #8A-28A)

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**PAINTER - STRIPER**

**Striper (paint)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$35.00

Supplemental Benefit Rate per Hour: \$12.27

Supplemental Note: Overtime Supplemental Benefit rate - \$8.02 New Hire Rate (0-3 months) - \$0.00

**Lineperson (thermoplastic)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$39.00

Supplemental Benefit Rate per Hour: \$12.27

Supplemental Note: Overtime Supplemental Benefit rate - \$8.02; New Hire Rate (0-3 months) - \$0.00

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

### 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

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

### Shift Rates

Employees hired before April 1, 2003: 15% night shift premium differential for work commenced at 9:00 PM or later.

### 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. Vacation must be taken during winter months. 2 Personal Days except employees hired after 4/1/12 who do not have 2 years of service.

(Local #917)

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## PAINTER - STRUCTURAL STEEL

### Painters on Structural Steel

Effective Period: 7/1/2015 - 9/30/2015

Wage Rate per Hour: \$48.00

Supplemental Benefit Rate per Hour: \$34.58

Effective Period: 10/1/2015 - 6/30/2016

Wage Rate per Hour: \$49.00

Supplemental Benefit Rate per Hour: \$36.08

### Painter - Power Tool

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
\$220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 9/30/2015

Wage Rate per Hour: **\$54.00**

Supplemental Benefit Rate per Hour: **\$34.58**

Effective Period: 10/1/2015 - 6/30/2016

Wage Rate per Hour: **\$55.00**

Supplemental Benefit Rate per Hour: **\$36.08**

### 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

Regular hourly rates plus a ten per cent (10%) differential

(Local #806)

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## PAPERHANGER

### Paperhanger

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$41.08**

Supplemental Benefit Rate per Hour: **\$29.23**

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Time and one half the regular rate for Saturday.  
Time and one half the regular rate for Sunday.

### Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day  
President's Day  
Memorial Day  
Independence Day  
Labor Day  
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)

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## PAVER AND ROADBUILDER

### Paver & Roadbuilder - Formsetter

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$44.85

Supplemental Benefit Rate per Hour: \$36.92

### 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 before the installation of rubberized materials and similar surfaces; installation and repair of temporary construction fencing; slurry seal coating, maintenance of safety surfaces; play equipment installation, and other related work.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$40.98

Supplemental Benefit Rate per Hour: \$36.92

### Production Paver & Roadbuilder - Screed Person

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

(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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$45.45

Supplemental Benefit Rate per Hour: \$36.92

### Production Paver & Roadbuilder - Raker

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$44.85

Supplemental Benefit Rate per Hour: \$36.92

### 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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$41.56

Supplemental Benefit Rate per Hour: \$36.92

### **Overtime Description**

Veteran's Day is a Paid Holiday for employees working on production paving.

If an employee works New Year's Day or Christmas Day, they receive the single time rate plus 25%.

Employees who work on a holiday listed below receive the straight time rate plus one day's pay 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.

### **Paid Holidays**

Memorial Day

Independence Day

Labor Day

Presidential Election 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 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 15% over the single time rate for the screed person, rakers and



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

shovelers directly involved only. 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)

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## PLASTERER

### Plasterer

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$43.43

Supplemental Benefit Rate per Hour: \$27.95

### 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.

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

Martin Luther King Jr. 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

When it is not possible to conduct alteration work during regular work hours, in a building occupied by tenants, said work shall proceed on a shift basis: however work over seven (7) hours in any twenty four (24) hour period, the time after seven (7) hours shall be considered overtime.

The second shift shall start at a time between 3:30 p.m. and 7:00 p.m. and shall consist of seven (7) working hours and shall receive eight (8) hours of wages and benefits at the straight time rate. The workers on the second shift shall be allowed one-half (½) hour to eat with this time being included in the seven (7) hours of work.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

(Local #530)

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## PLASTERER - TENDER

### Plasterer - Tender

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$36.67**

Supplemental Benefit Rate per Hour: **\$28.02**

### 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)

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## PLUMBER

### Plumber

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$65.27**

Supplemental Benefit Rate per Hour: **\$28.38**

Supplemental Note: Overtime supplemental benefit rate per hour: **\$56.48**

### 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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$52.24**

Supplemental Benefit Rate per Hour: **\$22.28**

### **Overtime Description**

Double time the regular rate after a 7 hour day - unless for new construction site work where the plumbing contract price is \$1.5 million or less, the hours of labor can be 8 hours per day at the employers option. On Alteration jobs when other mechanical trades at the site are working an eighth hour at straight time, then the plumber shall also work an eighth hour at straight time.

### **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

### **Shift Rates**

Shift work, when directly specified in public agency or authority documents where plumbing contract is \$8 million or less, will be permitted. 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)

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## **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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$39.27**

Supplemental Benefit Rate per Hour: **\$13.34**

### **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)

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## **PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME CONSTRUCTION)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$45.19**

Supplemental Benefit Rate per Hour: **\$20.62**

### **Overtime**

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

### **Overtime Holidays**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Double time the regular rate for work on the following holiday(s).

New Year's Day  
President's Day  
Memorial Day  
Independence Day  
Labor Day  
Columbus Day  
Veteran's Day  
Thanksgiving Day  
Day after Thanksgiving  
Christmas Day

### **Paid Holidays**

None

### **Shift Rates**

30% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shifts Monday to Friday.  
50% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shift work performed on weekends. For shift work on holidays, double time wages and fringe benefits shall be paid.

(Plumbers Local #1)

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## **PLUMBER: PUMP & TANK**

### **Oil Trades (Installation and Maintenance)**

#### **Plumber - Pump & Tank**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$62.83

Supplemental Benefit Rate per Hour: \$21.37

#### **Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

#### **Overtime Holidays**

Time and one half the regular rate for work on the following holiday(s).

New Year's Day  
President's Day  
Memorial Day  
Independence Day  
Labor Day  
Columbus Day  
Veteran's Day  
Thanksgiving Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Day after Thanksgiving  
Christmas Day

**Paid Holidays**

None

**Shift Rates**

All work outside the regular workday (8:00 A.M. to 3:30 P.M.) is to be paid at time and one half the regular hourly rate

(Plumbers Local #1)

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**POINTER - WATERPROOFER, CAULKER MECHANIC (EXTERIOR BUILDING RENOVATION)**

**Pointer - Waterproofer, Caulker Mechanic**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$47.41

Supplemental Benefit Rate per Hour: \$24.40

**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 4:30 P.M.) is to be paid at time and one half the regular rate.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

(Bricklayer District Council)

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## ROOFER

### Roofer

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$40.70**

Supplemental Benefit Rate per Hour: **\$30.17**

### 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

Presidential Election 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.

(Local #8)

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## SANDBLASTER - STEAMBLASTER (Exterior Building Renovation)

### Sandblaster / Steamblaster

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$47.41

Supplemental Benefit Rate per Hour: \$24.40

### 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 4:30 P.M.) is to be paid at time and one half the regular rate.

(Bricklayer District Council)

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## SHEET METAL WORKER

### Sheet Metal Worker

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$46.96

Supplemental Benefit Rate per Hour: \$45.19

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$37.57



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: **\$45.19**

**Sheet Metal Worker - Duct Cleaner**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$12.90**

Supplemental Benefit Rate per Hour: **\$8.07**

**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

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 (seven 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)

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**SHEET METAL WORKER - SPECIALTY**  
**(Decking & Siding)**

**Sheet Metal Specialty Worker**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$42.64

Supplemental Benefit Rate per Hour: \$23.62

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)

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## SHIPYARD WORKER

### Shipyard Mechanic - First Class

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$27.54

Supplemental Benefit Rate per Hour: \$3.01

### Shipyard Mechanic - Second Class

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$20.22

Supplemental Benefit Rate per Hour: \$2.73

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**Shipyard Laborer - First Class**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$20.90

Supplemental Benefit Rate per Hour: \$2.75

**Shipyard Laborer - Second Class**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$13.86

Supplemental Benefit Rate per Hour: \$2.48

**Shipyard Dockhand - First Class**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$23.61

Supplemental Benefit Rate per Hour: \$2.86

**Shipyard Dockhand - Second Class**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$15.94

Supplemental Benefit Rate per Hour: \$2.56

**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 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

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**SIGN ERECTOR**  
(Sheet Metal, Plastic, Electric, and Neon)

**Sign Erector**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$45.60**

Supplemental Benefit Rate per Hour: **\$46.28**

**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

Washington's Birthday

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)

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**STEAMFITTER**

**Steamfitter I**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$55.00**

Supplemental Benefit Rate per Hour: **\$52.79**

Supplemental Note: Overtime supplemental benefit rate: **\$104.84**

**Steamfitter -Temporary Services**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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. When steamfitters are present during the regular working day, no temporary services steamfitter will be required

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$41.80

Supplemental Benefit Rate per Hour: \$42.76

Supplemental Note: .

### Overtime

Double time the regular rate after a 7 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

### Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

### Paid Holidays

None

### Shift Rates

Work performed between 3:30 P.M. and 7:00 A.M. and on Saturdays, Sundays and Holidays shall be at double time the regular hourly rate and paid at the overtime supplemental benefit rate above.

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### Steamfitter II

For heating, ventilation, air conditioning and mechanical public works contracts with a dollar value not to exceed \$15,000,000 and for fire protection/sprinkler public works contracts not to exceed \$1,500,000.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$55.00

Supplemental Benefit Rate per Hour: \$52.79

Supplemental Note: Overtime supplemental benefit rate: \$104.84

### Steamfitter -Temporary Services

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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. When steamfitters are present during the regular working day, no temporary services steamfitter will be required.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$41.80

Supplemental Benefit Rate per Hour: \$42.76

### 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

May be performed outside of the regular workday except Saturday, Sunday and Holidays. A shift shall consist of eight working hours. All work performed in excess of eight hours shall be paid at double 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 A.M. Saturday or 12:01 A.M. the day before a Holiday will be paid at double time. When shift work is performed the wage rate for regular time worked is a thirty percent premium together with fringe benefits.

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

Local #638

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## STEAMFITTER - REFRIGERATION AND AIR CONDITIONER (Maintenance and Installation Service Person)

### Refrigeration and Air Conditioner Mechanic

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$39.25  
Supplemental Benefit Rate per Hour: \$13.81

**Refrigeration and Air Conditioner Service Person V**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$32.25  
Supplemental Benefit Rate per Hour: \$12.44

**Refrigeration and Air Conditioner Service Person IV**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$26.72  
Supplemental Benefit Rate per Hour: \$11.30

**Refrigeration and Air Conditioner Service Person III**

Filter changing and maintenance thereof, oil and greasing, tower and coil cleaning, scraping and painting, general housekeeping, taking of water samples.

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$22.93  
Supplemental Benefit Rate per Hour: \$10.45

**Refrigeration and Air Conditioner Service Person II**

Filter changing and maintenance thereof, oil and greasing, tower and coil cleaning, scraping and painting, general housekeeping, taking of water samples.

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$19.02  
Supplemental Benefit Rate per Hour: \$9.67

**Refrigeration and Air Conditioner Service Person I**

Filter changing and maintenance thereof, oil and greasing, tower and coil cleaning, scraping and painting, general housekeeping, taking of water samples.

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$13.91  
Supplemental Benefit Rate per Hour: \$8.78

**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**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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 #638B)

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## **STONE MASON - SETTER**

### **Stone Mason - Setters**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$47.20**

Supplemental Benefit Rate per Hour: **\$37.15**

### **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



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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)

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## **TAPER**

### **Drywall Taper**

Effective Period: 7/1/2015 - 12/29/2015

Wage Rate per Hour: **\$46.32**

Supplemental Benefit Rate per Hour: **\$22.66**

Effective Period: 12/30/2015 - 6/30/2016

Wage Rate per Hour: **\$46.82**

Supplemental Benefit Rate per Hour: **\$22.66**

### **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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**Shift Rates**

Time and one half the regular rate outside the regular work hours (8:00 A.M. through 3:30 P.M.)

(Local #1974)

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**TELECOMMUNICATION WORKER**  
(Voice Installation Only)

**Telecommunication Worker**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$40.35**

Supplemental Benefit Rate per Hour: **\$13.19**

Supplemental Note: The above rate applies for Manhattan, Bronx, Brooklyn, Queens. \$12.64 for Staten Island only.

**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  
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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

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.)

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**TILE FINISHER**

**Tile Finisher**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$40.03

Supplemental Benefit Rate per Hour: \$29.71

**Overtime**

Time and one half the regular rate after a 7 hour day.  
Time and one half the regular rate for Saturday.  
Double time the regular rate for Sunday.

**Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

- New Year's Day
- 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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**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)

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**TILE LAYER - SETTER**

**Tile Layer - Setter**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$51.61**

Supplemental Benefit Rate per Hour: **\$33.46**

**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)

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**TIMBERPERSON**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

**Timberperson**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$45.60**

Supplemental Benefit Rate per Hour: **\$46.67**

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Time and one half the regular hourly rate after 40 hours in any work week.

**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.

(Local #1536)

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**TUNNEL WORKER**

**Blasters, Mucking Machine Operators (Compressed Air Rates)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$59.17**

Supplemental Benefit Rate per Hour: **\$49.45**

**Tunnel Workers (Compressed Air Rates)**

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$57.12  
Supplemental Benefit Rate per Hour: \$47.80

**Top Nipper (Compressed Air Rates)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$56.07  
Supplemental Benefit Rate per Hour: \$46.96

**Outside Lock Tender, Outside Gauge Tender, Muck Lock Tender (Compressed Air Rates)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$55.06  
Supplemental Benefit Rate per Hour: \$46.07

**Bottom Bell & Top Bell Signal Person: Shaft Person (Compressed Air Rates)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$55.06  
Supplemental Benefit Rate per Hour: \$46.07

**Changehouse Attendant: Powder Watchperson (Compressed Air Rates)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$48.16  
Supplemental Benefit Rate per Hour: \$43.62

**Blasters (Free Air Rates)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$56.47  
Supplemental Benefit Rate per Hour: \$47.47

**Tunnel Workers (Free Air Rates)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$54.04  
Supplemental Benefit Rate per Hour: \$45.45

**All Others (Free Air Rates)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$49.93  
Supplemental Benefit Rate per Hour: \$42.06

**Microtunneling (Free Air Rates)**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
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Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$43.23

Supplemental Benefit Rate per Hour: \$36.36

### Overtime Description

For Repair-Maintenance Work on Existing Equipment and Facilities - Time and one half the regular rate after a 7 hour day, or for Saturday, or for Sunday. Double time the regular rate for work on a holiday.

For Small-Bore Micro Tunneling Machines - Time and one-half the regular rate shall be paid for all overtime.

### 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

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

(Local #147)

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## WELDER

TO BE PAID AT THE RATE OF THE JOURNEYPERSON IN THE TRADE  
PERFORMING THE WORK.

**OFFICE OF THE COMPTROLLER**

**CITY OF NEW YORK**

**220 APPRENTICESHIP PREVAILING WAGE SCHEDULE**

**APPENDIX**

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 employed on a public work project.

Any employee listed on a payroll at an apprentice wage rate, who is not registered as above, shall be paid the journey person wage rate for the classification of work he actually performed.

Apprentice ratios are established to ensure the proper safety, training and supervision of apprentices. A ratio establishes the number of journey workers required for each apprentice in a program and on a job site. Ratios are interpreted as follows: in the case of a 1:1, 1:4 ratio, there must be one journey worker for the first apprentice, and four additional journey workers for each subsequent apprentice.



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

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## **ASBESTOS HANDLER**

(Ratio of Apprentice Journeyperson: 1 to 1, 1 to 3)

### **Asbestos Handler (First 1000 Hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 78% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$15.95

### **Asbestos Handler (Second 1000 Hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$15.95

### **Asbestos Handler (Third 1000 Hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 83% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$15.95

### **Asbestos Handler (Fourth 1000 Hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 89% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$15.95

(Local #78)

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## **BOILERMAKER**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

### **Boilermaker (First Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 65% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$30.00

### **Boilermaker (Second Year: 1st Six Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 70% of Journeyperson's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
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Supplemental Benefit Rate Per Hour: \$31.66

**Boilermaker (Second Year: 2nd Six Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$33.32

**Boilermaker (Third Year: 1st Six Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$35.00

**Boilermaker (Third Year: 2nd Six Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 85% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$36.67

**Boilermaker (Fourth Year: 1st Six Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 90% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$38.34

**Boilermaker (Fourth Year: 2nd Six Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 95% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$40.01

(Local #5)

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**BRICKLAYER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

**Bricklayer (First 750 Hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$17.10

**Bricklayer (Second 750 Hours)**

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Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 60% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$17.10

**Bricklayer (Third 750 Hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 70% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$17.10

**Bricklayer (Fourth 750 Hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$17.10

**Bricklayer (Fifth 750 Hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 90% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$17.10

**Bricklayer (Sixth 750 Hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 95% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$17.10

(Bricklayer District Council)

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**CARPENTER**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

**Carpenter (First Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 40% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$31.14

**Carpenter (Second Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$31.14

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

**Carpenter (Third Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 65% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$31.14

**Carpenter (Fourth Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$31.14

(Carpenters District Council)

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**CEMENT MASON**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

**Cement Mason (First Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's Rate

**Cement Mason (Second Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's Rate

**Cement Mason (Third Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's Rate

(Local #780)

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**CEMENT AND CONCRETE WORKER**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

**Cement & Concrete Worker (First 1333 hours)**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
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Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$18.84

**Cement & Concrete Worker (Second 1333 hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 65% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$24.65

**Cement & Concrete Worker (Last 1334 hours)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$25.47

(Cement Concrete Workers District Council)

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**DERRICKPERSON & RIGGER (STONE)**  
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

**Derrickperson & Rigger (stone) - First Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: 50% of Journeyman's rate

**Derrickperson & Rigger (stone) - Second Year: 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 70% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: 75% of Journeyman's rate

**Derrickperson & Rigger (stone) - Second Year: 2nd Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: 75% of Journeyman's rate

**Derrickperson & Rigger (stone) - Third Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 90% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: 75% of Journeyman's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

(Local #197)

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**DOCKBUILDER/PILE DRIVER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 6)

**Dockbuilder/Pile Driver (First Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 40% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$31.52

**Dockbuilder/Pile Driver (Second Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$31.52

**Dockbuilder/Pile Driver (Third Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 65% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$31.52

**Dockbuilder/Pile Driver (Fourth Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 80% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$31.52

(Carpenters District Council)

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**ELECTRICIAN**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

**Electrician (First Term: 0-6 Months)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$13.00

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§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$11.61  
Overtime Supplemental Rate Per Hour: \$12.47

**Electrician (First Term: 7-12 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$14.00  
Supplemental Benefit Rate per Hour: \$12.12  
Overtime Supplemental Rate Per Hour: \$13.04

**Electrician (Second Term: 0-6 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$15.00  
Supplemental Benefit Rate per Hour: \$12.63  
Overtime Supplemental Rate Per Hour: \$13.62

**Electrician (Second Term: 7-12 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$16.00  
Supplemental Benefit Rate per Hour: \$13.14  
Overtime Supplemental Rate Per Hour: \$14.19

**Electrician (Third Term: 0-6 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$17.00  
Supplemental Benefit Rate per Hour: \$13.65  
Overtime Supplemental Rate Per Hour: \$14.77

**Electrician (Third Term: 7-12 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$18.00  
Supplemental Benefit Rate per Hour: \$14.16  
Overtime Supplemental Rate Per Hour: \$15.34

**Electrician (Fourth Term: 0-6 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$19.00  
Supplemental Benefit Rate per Hour: \$14.67  
Overtime Supplemental Rate Per Hour: \$15.92

**Electrician (Fourth Term: 7-12 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$21.00



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Supplemental Benefit Rate per Hour: \$15.68  
Overtime Supplemental Rate Per Hour: \$17.07

**Electrician (Fifth Term: 0-12 Months - Hired on or after 5/10/07)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$23.00  
Supplemental Benefit Rate per Hour: \$18.56  
Overtime Supplemental Rate Per Hour: \$20.00

**Electrician (Fifth Term: 13-18 Months - Hired on or after 5/10/07)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$27.50  
Supplemental Benefit Rate per Hour: \$20.82  
Overtime Supplemental Rate Per Hour: \$22.54

**Electrician (Fifth Term: 0-18 Months - Hired before 5/10/07)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$26.80  
Supplemental Benefit Rate per Hour: \$20.46  
Overtime Supplemental Rate Per Hour: \$22.14

**Overtime Description**

Overtime Wage paid at time and one half the regular rate  
For "A" rated Apprentices (work in excess of 7 hours per day)  
For "M" rated Apprentices (work in excess of 8 hours per day)

(Local #3)

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**ELEVATOR CONSTRUCTOR**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 2)

**Elevator (Constructor) - First Year**

Effective Period: 7/1/2015 - 3/16/2016  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$26.94

Effective Period: 3/17/2016 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$28.41

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**Elevator (Constructor) - Second Year**

Effective Period: 7/1/2015 - 3/16/2016  
Wage Rate Per Hour: 55% of Journeyperson's rate  
Supplemental Rate Per Hour: \$27.35

Effective Period: 3/17/2016 - 6/30/2016  
Wage Rate Per Hour: 55% of Journeyperson's rate  
Supplemental Rate Per Hour: \$28.84

**Elevator (Constructor) - Third Year**

Effective Period: 7/1/2015 - 3/16/2016  
Wage Rate Per Hour: 65% of Journeyperson's rate  
Supplemental Rate Per Hour: \$28.17

Effective Period: 3/17/2016 - 6/30/2016  
Wage Rate Per Hour: 65% of Journeyperson's rate  
Supplemental Rate Per Hour: \$29.69

**Elevator (Constructor) - Fourth Year**

Effective Period: 7/1/2015 - 3/16/2016  
Wage Rate Per Hour: 75% of Journeyperson's rate  
Supplemental Rate Per Hour: \$29.00

Effective Period: 3/17/2016 - 6/30/2016  
Wage Rate Per Hour: 75% of Journeyperson's rate  
Supplemental Rate Per Hour: \$30.54

(Local #1)

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**ELEVATOR REPAIR & MAINTENANCE**  
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

**Elevator Service/Modernization Mechanic (First Year)**

Effective Period: 7/1/2015 - 3/16/2016  
Wage Rate Per Hour: 50% of Journeyperson's rate  
Supplemental Benefit Per Hour: \$26.87

Effective Period: 3/17/2016 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyperson's rate  
Supplemental Benefit Per Hour: \$28.34

**Elevator Service/Modernization Mechanic (Second Year)**

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Effective Period: 7/1/2015 - 3/16/2016  
Wage Rate Per Hour: 55% of Journeyperson's rate  
Supplemental Benefit Per Hour: \$27.27

Effective Period: 3/17/2016 - 6/30/2016  
Wage Rate Per Hour: 55% of Journeyperson's rate  
Supplemental Benefit Per Hour: \$28.76

**Elevator Service/Modernization Mechanic (Third Year)**

Effective Period: 7/1/2015 - 3/16/2016  
Wage Rate Per Hour: 65% of Journeyperson's rate  
Supplemental Benefit Per Hour: \$28.08

Effective Period: 3/17/2016 - 6/30/2016  
Wage Rate Per Hour: 65% of Journeyperson's rate  
Supplemental Benefit Per Hour: \$29.60

**Elevator Service/Modernization Mechanic (Fourth Year)**

Effective Period: 7/1/2015 - 3/16/2016  
Wage Rate Per Hour: 75% of Journeyperson's rate  
Supplemental Benefit Per Hour: \$28.89

Effective Period: 3/17/2016 - 6/30/2016  
Wage Rate Per Hour: 75% of Journeyperson's rate  
Supplemental Benefit Per Hour: \$30.43

(Local #1)

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**ENGINEER**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

**Engineer - First Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$23.68  
Supplemental Benefit Rate per Hour: \$22.55

**Engineer - Second Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$29.60  
Supplemental Benefit Rate per Hour: \$22.55

**Engineer - Third Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$32.56**  
Supplemental Benefit Rate per Hour: **\$22.55**

**Engineer - Fourth Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$35.52**  
Supplemental Benefit Rate per Hour: **\$22.55**

(Local #15)

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**ENGINEER - OPERATING**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

**Operating Engineer - First Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour 40% of Journeyperson's Rate  
Supplemental Benefit Per Hour: **\$20.15**

**Operating Engineer - Second Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyperson's Rate  
Supplemental Benefit Per Hour: **\$20.15**

**Operating Engineer - Third Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 60% of Journeyperson's Rate  
Supplemental Benefit Per Hour: **\$20.15**

(Local #14)

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## **FLOOR COVERER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

### **Floor Coverer (First Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 40% of Journeyman's rate  
Supplemental Rate Per Hour: \$31.14

### **Floor Coverer (Second Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$31.14

### **Floor Coverer (Third Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 65% of Journeyman's rate  
Supplemental Rate Per Hour: \$31.14

### **Floor Coverer (Fourth Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Rate Per Hour: \$31.14

(Carpenters District Council)

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## **GLAZIER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

### **Glazier (First Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 40% of Journeyman's rate  
Supplemental Rate Per Hour: \$13.64  
Effective 11/1/2015 - Supplemental Rate Per Hour: \$13.79

### **Glazier (Second Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyman's rate

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Supplemental Rate Per Hour: \$22.97  
Effective 11/1/2015 - Supplemental Rate Per Hour: \$23.13

**Glazier (Third Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 60% of Journeyman's rate  
Supplemental Rate Per Hour: \$25.87  
Effective 11/1/2015 - Supplemental Rate Per Hour: \$26.03

**Glazier (Fourth Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Rate Per Hour: \$31.04  
Effective 11/1/2015 - Supplemental Rate Per Hour: \$31.29

(Local #1281)

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**HEAT & FROST INSULATOR**  
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

**Heat & Frost Insulator (First Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 40% of Journeyman's rate

**Heat & Frost Insulator (Second Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

**Heat & Frost Insulator (Third Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 70% of Journeyman's rate

**Heat & Frost Insulator (Fourth Year)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 80% of Journeyman's rate

(Local #12)

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**HOUSE WRECKER  
(TOTAL DEMOLITION)  
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)**

**House Wrecker - First Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$21.17  
Supplemental Benefit Rate per Hour: \$17.33

**House Wrecker - Second Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$22.32  
Supplemental Benefit Rate per Hour: \$17.33

**House Wrecker - Third Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$23.97  
Supplemental Benefit Rate per Hour: \$17.33

**House Wrecker - Fourth Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$26.53  
Supplemental Benefit Rate per Hour: \$17.33

(Mason Tenders District Council)

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**IRON WORKER - ORNAMENTAL  
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)**

**Iron Worker (Ornamental) - 1st Ten Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$36.50

**Iron Worker (Ornamental) - 11 -16 Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 55% of Journeyperson's rate  
Supplemental Rate Per Hour: \$37.62

**Iron Worker (Ornamental) - 17 - 22 Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 60% of Journeyperson's rate  
Supplemental Rate Per Hour: \$38.73

**Iron Worker (Ornamental) - 23 - 28 Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 70% of Journeyperson's rate  
Supplemental Rate Per Hour: \$40.97

**Iron Worker (Ornamental) - 29 - 36 Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyperson's rate  
Supplemental Rate Per Hour: \$43.20

(Local #580)

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**IRON WORKER - STRUCTURAL**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

**Iron Worker (Structural) - 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$25.48  
Supplemental Benefit Rate per Hour: \$46.83

**Iron Worker (Structural) - 7- 18 Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$26.08  
Supplemental Benefit Rate per Hour: \$46.83

**Iron Worker (Structural) - 19 - 36 months**



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
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Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$26.68  
Supplemental Benefit Rate per Hour: \$46.83

(Local #40 and #361)

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**LABORER (FOUNDATION, CONCRETE, EXCAVATING, STREET PIPE  
LAYER & COMMON)**

(Ratio Apprentice to Journeyman: 1 to 1, 1 to 3)

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - First  
1000 hours**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$36.53

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) -  
Second 1000 hours**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 60% of Journeyman's rate  
Supplemental Rate Per Hour: \$36.53

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) -  
Third 1000 hours**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Rate Per Hour: \$36.53

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) -  
Fourth 1000 hours**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 90% of Journeyman's rate  
Supplemental Rate Per Hour: \$36.53

(Local #731)

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## **MARBLE MECHANICS**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

### **Cutters & Setters - First 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 50% of Journeyman's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

### **Cutters & Setters - Second 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 55% of Journeyman's rate

### **Cutters & Setters - Third 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 65% of Journeyman's rate

### **Cutters & Setters - Fourth 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 75% of Journeyman's rate

### **Cutters & Setters - Fifth 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 85% of Journeyman's rate

### **Cutters & Setters - Sixth 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 95% of Journeyman's rate

### **Polishers & Finishers - First 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 50% of Journeyman's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

### **Polishers & Finishers - Second 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
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**Polishers & Finishers - Third 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

**Polishers & Finishers - Fourth 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 90% of Journeyperson's rate

(Local #7)

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**MASON TENDER**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

**Mason Tender - First Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$21.39  
Supplemental Benefit Rate per Hour: \$18.44

**Mason Tender - Second Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$22.54  
Supplemental Benefit Rate per Hour: \$18.44

**Mason Tender - Third Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$24.29  
Supplemental Benefit Rate per Hour: \$18.49

**Mason Tender - Fourth Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$26.95  
Supplemental Benefit Rate per Hour: \$18.49

(Local #79)

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## **METALLIC LATHER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

### **Metallic Lather (First Year -Called Prior to 6/29/11)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$29.41

Supplemental Benefit Rate per Hour: \$22.89

### **Metallic Lather (Second Year - Called Prior to 6/29/11)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$34.01

Supplemental Benefit Rate per Hour: \$24.54

### **Metallic Lather (Third Year - Called Prior to 6/29/11)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$39.07

Supplemental Benefit Rate per Hour: \$25.69

### **Metallic Lather (First Year -Called On Or After 6/29/11)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$23.01

Supplemental Benefit Rate per Hour: \$17.95

### **Metallic Lather (Second Year - Called On Or After 6/29/11)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$28.11

Supplemental Benefit Rate per Hour: \$17.95

### **Metallic Lather (Third Year - Called On Or After 6/29/11)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$33.21

Supplemental Benefit Rate per Hour: \$17.95

(Local #46)

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## **MILLWRIGHT**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

### **Millwright (First Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$27.23

Supplemental Benefit Rate per Hour: \$34.06

### **Millwright (Second Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$32.18

Supplemental Benefit Rate per Hour: \$37.62

### **Millwright (Third Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$37.13

Supplemental Benefit Rate per Hour: \$41.83

### **Millwright (Fourth Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$47.03

Supplemental Benefit Rate per Hour: \$48.31

(Local #740)

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## **PAVER AND ROADBUILDER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

### **Paver and Roadbuilder - First Year (Minimum 1000 hours)**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$27.05

Supplemental Benefit Rate per Hour: \$17.12

### **Paver and Roadbuilder - Second Year (Minimum 1000 hours)**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$28.69**  
Supplemental Benefit Rate per Hour: **\$17.12**

(Local #1010)

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**PAINTER**  
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

**Painter - Brush & Roller - First Year**

Effective Period: 7/1/2015 - 10/31/2015  
Wage Rate per Hour: **\$15.80**  
Supplemental Benefit Rate per Hour: **\$11.88**

Effective Period: 11/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$16.40**  
Supplemental Benefit Rate per Hour: **\$12.13**

**Painter - Brush & Roller - Second Year**

Effective Period: 7/1/2015 - 10/31/2015  
Wage Rate per Hour: **\$19.75**  
Supplemental Benefit Rate per Hour: **\$15.73**

Effective Period: 11/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$20.50**  
Supplemental Benefit Rate per Hour: **\$15.98**

**Painter - Brush & Roller - Third Year**

Effective Period: 7/1/2015 - 10/31/2015  
Wage Rate per Hour: **\$23.70**  
Supplemental Benefit Rate per Hour: **\$18.64**

Effective Period: 11/1/2015 - 6/30/2016  
Wage Rate per Hour: **\$24.60**  
Supplemental Benefit Rate per Hour: **\$18.89**

**Painter - Brush & Roller - Fourth Year**

Effective Period: 7/1/2015 - 10/31/2015  
Wage Rate per Hour: **\$31.60**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$24.02

Effective Period: 11/1/2015 - 6/30/2016

Wage Rate per Hour: \$32.80

Supplemental Benefit Rate per Hour: \$24.27

(District Council of Painters)

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## **PAINTER - STRUCTURAL STEEL**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

### **Painters - Structural Steel (First Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 40% of Journeyman's rate

### **Painters - Structural Steel (Second Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

### **Painters - Structural Steel (Third Year)**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 80% of Journeyman's rate

(Local #806)

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## **PLASTERER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

### **Plasterer - First Year: 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 40% of Journeyman's rate

Supplemental Rate Per Hour: \$15.76

### **Plasterer - First Year: 2nd Six Months**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 45% of Journeyman's rate  
Supplemental Rate Per Hour: \$16.24

**Plasterer - Second Year: 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 55% of Journeyman's rate  
Supplemental Rate Per Hour: \$18.21

**Plasterer - Second Year: 2nd Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 60% of Journeyman's rate  
Supplemental Rate Per Hour: \$19.29

**Plasterer - Third Year: 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 70% of Journeyman's rate  
Supplemental Rate Per Hour: \$21.46

**Plasterer - Third Year: 2nd Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Rate Per Hour: \$22.54

(Local #530)

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**PLUMBER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

**Plumber - First Year: 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$14.00  
Supplemental Benefit Rate per Hour: \$0.71

**Plumber - First Year: 2nd Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate per Hour: \$14.00



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$2.96

**Plumber - Second Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$23.87

Supplemental Benefit Rate per Hour: \$12.76

**Plumber - Third Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$25.97

Supplemental Benefit Rate per Hour: \$12.76

**Plumber - Fourth Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$28.82

Supplemental Benefit Rate per Hour: \$12.76

**Plumber - Fifth Year: 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$30.22

Supplemental Benefit Rate per Hour: \$12.76

**Plumber - Fifth Year: 2nd Six Months**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$42.29

Supplemental Benefit Rate per Hour: \$12.76

(Plumbers Local #1)

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**POINTER - WATERPROOFER, CAULKER MECHANIC (EXTERIOR  
BUILDING RENOVATION)**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

**Pointer - Waterproofer, Caulker Mechanic - First Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$25.01

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$4.75

**Pointer - Waterproofer, Caulker Mechanic - Second Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$27.25

Supplemental Benefit Rate per Hour: \$9.70

**Pointer - Waterproofer, Caulker Mechanic - Third Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$32.24

Supplemental Benefit Rate per Hour: \$12.45

**Pointer - Waterproofer, Caulker Mechanic - Fourth Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$38.66

Supplemental Benefit Rate per Hour: \$12.45

(Bricklayer District Council)

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**ROOFER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 2)

**Roofer - First Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 35% of Journeyman's Rate

**Roofer - Second Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 50% of Journeyman's Rate

**Roofer - Third Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 60% of Journeyman's Rate

**Roofer - Fourth Year**

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's Rate

(Local #8)

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**SHEET METAL WORKER**  
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

**Sheet Metal Worker (0-6 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 25% of Journeyperson's rate  
Supplemental Rate Per Hour: \$6.24

**Sheet Metal Worker (7-18 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 35% of Journeyperson's rate  
Supplemental Rate Per Hour: \$16.71

**Sheet Metal Worker (19-30 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 45% of Journeyperson's rate  
Supplemental Rate Per Hour: \$23.00

**Sheet Metal Worker (31-36 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 55% of Journeyperson's rate  
Supplemental Rate Per Hour: \$27.02

**Sheet Metal Worker (37-42 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 60% of Journeyperson's rate  
Supplemental Rate Per Hour: \$29.06

**Sheet Metal Worker (43-48 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 70% of Journeyperson's rate  
Supplemental Rate Per Hour: \$33.10

**Sheet Metal Worker (49-54 Months)**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Rate Per Hour: \$35.12

**Sheet Metal Worker (55-60 Months)**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Rate Per Hour: \$37.15

(Local #28)

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**SIGN ERECTOR**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

**Sign Erector - First Year: 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 35% of Journeyman's rate  
Supplemental Rate Per Hour: \$13.18

**Sign Erector - First Year: 2nd Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 40% of Journeyman's rate  
Supplemental Rate Per Hour: \$14.95

**Sign Erector - Second Year: 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 45% of Journeyman's rate  
Supplemental Rate Per Hour: \$16.74

**Sign Erector - Second Year: 2nd Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$18.52

**Sign Erector - Third Year: 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 55% of Journeyman's rate  
Supplemental Rate Per Hour: \$24.94

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

**Sign Erector - Third Year: 2nd Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 60% of Journeyman's rate  
Supplemental Rate Per Hour: \$26.87

**Sign Erector - Fourth Year: 1st Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 65% of Journeyman's rate  
Supplemental Rate Per Hour: \$29.47

**Sign Erector - Fourth Year: 2nd Six Months**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 70% of Journeyman's rate  
Supplemental Rate Per Hour: \$31.46

**Sign Erector - Fifth Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Rate Per Hour: \$33.43

**Sign Erector - Sixth Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Rate Per Hour: \$35.41

(Local #137)

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**STEAMFITTER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

**Steamfitter - First Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate and Supplemental Per Hour: 40% of Journeyman's rate

**Steamfitter - Second Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate and Supplemental Rate Per Hour: 50% of Journeyman's rate.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

**Steamfitter - Third Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate and Supplemental Rate per Hour: 65% of Journeyperson's rate.

**Steamfitter - Fourth Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate and Supplemental Rate Per Hour: 80% of Journeyperson's rate.

**Steamfitter - Fifth Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate and Supplemental Rate Per Hour: 85% of Journeyperson's rate.

(Local #638)

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**STONE MASON - SETTER**

(Ratio Apprentice of Journeyperson: 1 to 1, 1 to 2)

**Stone Mason - Setters - First 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

**Stone Mason - Setters - Second 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

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: 7/1/2015 - 6/30/2016

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: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Rate Per Hour: 50% of Journeyperson's rate

**Stone Mason - Setters - Fifth 750 Hours**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016  
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: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 100% of Journeyperson's rate  
Supplemental Rate Per Hour: 50% of Journeyperson's rate

(Bricklayers District Council)

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**TAPER**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

**Drywall Taper - First Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

**Drywall Taper - Second Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

**Drywall Taper - Third Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #1974)

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**TILE LAYER - SETTER**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

**Tile Layer - Setter - First 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

**Tile Layer - Setter - Second 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

**Tile Layer - Setter - Third 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

**Tile Layer - Setter - Fourth 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

**Tile Layer - Setter - Fifth 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

**Tile Layer - Setter - Sixth 750 Hours**

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 95% of Journeyperson's rate

(Local #7)

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**TIMBERPERSON**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

**Timberperson - First Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 40% of Journeyperson's rate

Supplemental Rate Per Hour: \$31.54

**Timberperson - Second Year**

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Rate Per Hour: \$31.54



OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

**Timberperson - Third Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 65% of Journeyperson's rate  
Supplemental Rate Per Hour: \$31.54

**Timberperson - Fourth Year**

Effective Period: 7/1/2015 - 6/30/2016  
Wage Rate Per Hour: 80% of Journeyperson's rate  
Supplemental Rate Per Hour: \$31.54

(Local #1536)



NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

Issue Date - June 01, 2013  
Revised - January 15, 2015

**DDC STANDARD GENERAL CONDITIONS  
FOR SINGLE CONTRACT PROJECTS**



NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

Issue Date - June 01, 2013  
Revised - January 15, 2015

No Text



NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

Issue Date - June 01, 2013  
Revised - January 15, 2015

**DIVISION 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
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01 50 00	TEMPORARY FACILITIES, SERVICES AND CONTROLS
01 54 11	TEMPORARY ELEVATORS AND HOISTS
01 54 23	TEMPORARY SCAFFOLDING AND PLATFORMS
01 73 00	EXECUTION
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 77 00	CLOSEOUT PROCEDURES
01 78 39	CONTRACT RECORD DOCUMENTS
01 79 00	DEMONSTRATION AND OWNERS PRE-ACCEPTANCE ORIENTATION
01 81 13	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS
01 81 13.13	VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED BUILDINGS
01 81 19	INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS
01 91 13	GENERAL COMMISSIONING REQUIREMENTS



NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

Issue Date - June 01, 2013  
Revised - January 15, 2015

NO TEXT

**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 (Schedule A through F), (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" shall 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 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, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED 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 shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS, and the Addendum to the General Conditions. The Contractor shall cooperate with the commissioning agent and provide whatever assistance is required.
- D. PROGRESS SCHEDULE: Refer to Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION 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 shall be performed by the Contractor as though it were originally delineated or described. The cost of such work shall 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 shall be performed by the Contractor. The cost of such work shall 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, shall 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 shall 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 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 before the submission of the bid as to what shall 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 shall be subject to the terms of the Contract. The Supplementary Drawings shall 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 shall 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 shall 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 shall verify all dimensions, quantities and details shown on the Contract Drawings, Schedules, or other data received from the Commissioner, and shall notify the Commissioner of all errors, omissions, conflicts and discrepancies found therein. Notice of such errors shall be given before the Contractor proceeds with any work. Figures shall be used in preference to scale dimensions and large-scale drawings in preference to small-scale drawings.

**1.7 SHOP DRAWINGS AND RECORD DRAWINGS:**

Refer to Division I Section 01 33 00 – SUBMITAL PROCEDURES and Section 01 78 39 – PROJECT RECORD DRAWINGS for requirements applicable to shop drawings and record drawings.

**1.8 TEMPORARY FACILITIES, SERVICES AND CONTROLS:**

Refer to Division I Section 01 50 00 – TEMPORARY FACILITIES SERVICES AND CONTROLS for the responsibilities of the Contractor.

**1.9 DUST CONTROL:**

The Contractor shall 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, shall 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 insure 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 shall 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 shall be accompanied by a schedule of the types and quantities of materials, and shall 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 shall 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 shall set apart and separately store at the place or places of storage all materials and shall clearly mark same "PROPERTY OF THE CITY OF NEW YORK", and further, shall 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 shall be stored at such locations as shall 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 shall 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 shall 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 shall be payable to the City of New York. It shall be in such terms and amounts as shall be approved by the Commissioner and shall be placed with a company duly licensed to do business in the State of New York. The Contractor shall 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 shall 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 shall 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, shall 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 shall have and may exercise any and all other remedies at law for the recovery of such cost, charges and expenses. There shall be no



increase in the Contract price for such costs, charges and expenses and the Contractor shall not make any claim or demand for compensation therefore.

6. The Contractor shall 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 shall 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, shall 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 shall 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 shall 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 shall 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 shall 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 shall 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 shall 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 shall 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, shall preclude the Contractor from payments under the Contract.



- 14. The Contractor shall include in each succeeding partial estimate requisition a summary of materials stored which shall 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 shall 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 shall 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 shall be deemed included in the total Contract Price. The Detailed Bid Breakdown shall reflect, and the Mobilization Payment shall be made, in accordance with the following schedule:

Contract Amount	Percent	Mobilization
Less than - \$ 50,000	x 0	= 0
\$ 50,000 - \$ 100,000	x	= \$ 6,000
\$ 100,001 - \$ 500,000	x 6	= \$ 6,000 (min) - \$ 30,000 (max)
\$ 500,000 - \$ 2,500,000	x 5	= \$ 30,000 (min) - \$ 125,000 (max)
Over - \$ 2,500,000	x 4	= \$ 125,000 (min) - \$ 300,000 (max)

The Contractor may requisition for one-half (1/2) of the Mobilization Payment upon satisfactory completion of the following:

- 1. Installation of any required field office(s).
  - 2. Submission of all required insurance certificates and bonds.
  - 3. Approval by the Department of Design and Construction of the coordinated progress schedule for the project and the Contractor's Shop Drawing schedule.
- The remaining balance of the Mobilization Payment may be requisitioned only after 10 percent (10%) of the Contract price, exclusive of the total amount of Mobilization Payments made or to be made hereunder, shall have been approved for payment.
- E. ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING: The Contractor shall 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 shall 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 shall (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 shall 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) shall 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 shall 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 shall 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 shall be made as brief as possible, and only at such time stated.
  - 2 Under no circumstances shall 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 shall be avoided at all times and necessary noise shall 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 shall 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 shall be borne by the Contractor.



NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

Division 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS

Issue Date - June 01, 2013

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- 6 The Contractor shall 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 shall give ample written notice in advance to the Commissioner and personnel at the facility of any required shutdown.

**PART II – PRODUCTS (Not Used)**

**PART III – EXECUTION (Not Used)**

**END OF SECTION 01 10 00**

**SECTION 01 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, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED 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 shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS. The Contractor shall 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 without limitation the following.
  - 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: include without limitation the following:
  - 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 PROJECT 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" shall 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 shall 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 shall 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 accessibility 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 accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
- B. The Contractor shall prepare memoranda for distribution to its subcontractors and other involved entities, outlining special procedures required for coordination. Such memoranda shall include required notices, reports, and meeting minutes as applicable.
- C. Administrative Procedures: The Contractor shall 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 shall 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 shall comply with all directions in the Specifications regarding the salvaging and handling of identified items, material or equipment.

**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 shall 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 15 days after the Notice to Proceed, the Contractor shall 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 list in Project meeting room, in temporary field office, and by each temporary telephone. Keep 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 shall have their representatives present to discuss all details relative to the execution of the work. The Resident Engineer shall 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 shall 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 shall 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 Client 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 shall 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 Requests for Information (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. Client 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
  - 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 shall 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. Client 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
  - 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
  - p. Status of Administrative Code reporting requirements related to the project

**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 shall prepare and submit an RFI in the form specified by the Resident Engineer.
  1. RFI shall 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 shall prepare, maintain, and submit a tabular log of RFIs organized by the RFI number monthly to the Resident Engineer.



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4. On receipt of responses and action to the RFI, the Contractor shall 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:**

Copies of all correspondence to DDC shall be sent directly to the Resident Engineer at the job site.

**1.9 CONTRACTOR'S DAILY REPORTS:**

The Contractor shall prepare and submit Daily Construction Progress Reports as outlined in Section 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION.

**PART II – PRODUCTS (Not Used)**

**PART III – EXECUTION (Not Used)**

**END OF SECTION 01 31 00**

**SECTION 01 32 00**  
**CONSTRUCTION PROGRESS DOCUMENTATION**

**PART I – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for establishing an effective base line schedule for the project and documenting the progress of construction during performance of the Work by developing, revising as necessary, various documents including but not limited to the following:
1. Baseline Construction Schedule.
  2. Composite Schedule for entire project
  3. Recovery Composite Schedule
  4. Revised and/or updated Composite Schedule
  5. Submittals Schedule.
  6. Daily construction reports.
  7. Material location reports.
  8. Field condition reports.
  9. Special reports.
- B. RELATED SECTIONS: include without limitation the following:
1. Section 01 10 00 SUMMARY
  2. Section 01 32 22 PHOTOGRAPHIC DOCUMENTATION
  3. Section 01 33 00 SUBMITTAL PROCEDURES
  4. 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" shall 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. **Baseline Construction Schedule:**  
A horizontal bar chart type schedule (Microsoft Project OR similar program) listing all the activities and their duration for entire contract duration OR construction period, including logical ties and interrelations between the activities necessary for the timely and successful completion of the project. Critical path activities shall be clearly marked. The Baseline construction schedule is a preliminary schedule that must be reviewed and approved by the Resident Engineer.
- D. **Composite Schedule:**  
A composite horizontal bar chart type schedule (Microsoft Project OR similar program) listing all activities to be performed by the Contractor and its subcontractors, the duration of each activity including logical ties and interrelations between activities, and the sequence of each of necessary activities for the timely and successful completion of the project within the stipulated contract duration. Critical path activities shall be clearly marked. The Composite schedule must be signed and submitted by the Contractor within thirty (30) calendar days after the date established for commencement of the Contract, unless otherwise directed. The Composite Schedule must be reviewed and approved by the Resident Engineer.
- E. **Recovery Composite Schedule:** A Recovery Composite Schedule is not required unless the City issues an Acceleration Change Order.  
  
A Composite 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 keep the delays as minimum as possible and must establish the nature of efforts such as 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.  
  
Such schedule must be prepared and submitted within Five (5) calendar days of request by the Resident Engineer. The Recovery Composite Schedule must be reviewed and approved by the Resident Engineer.
- F. **Revised and/or Updated Composite Schedule:**  
  
A Baseline construction schedule OR Composite Schedule OR Recovery Composite 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 Composite Schedule must be reviewed and approved by the Resident Engineer.
- G. **Activity:** A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
- H. **Event:** The starting or ending point of an activity.
- I. **Fragment:** A part of the activity that breaks down activities into smaller activities for greater detail.
- J. **Milestone:** A key or critical point in time for reference or measurement.
- K. **Network Diagram:** A graphic diagram of a network schedule, showing activities and activity relationships.



## PART II – PRODUCTS

### 2.1 BASELINE CONSTRUCTION SCHEDULE:

- A. The Contractor shall prepare a Baseline horizontal bar-chart-type construction schedule for the project. Submit the Baseline Construction Schedule to the Resident Engineer within (15) fifteen calendar days after the date established for commencement of the Contract, unless directed otherwise. The Baseline Schedule must be reviewed and approved by the Resident Engineer.
1. Provide a separate time bar for each significant construction activity. Coordinate each activity on the schedule with other construction activities for proper interrelationship & sequence.
  2. Duration: The duration of each activity on the schedule besides installation must clearly show required duration of filing for permits, inspections, testing, approvals, shop drawings and materials submittals and approvals, fabrication, delivery, phasing for each construction activity.
  3. Schedule shall be time-scaled in not more than weekly increments, with the dates of the first day (Monday) of each week indicated.
  4. Completion of all the project activities shall be indicated in advance of the date established for completion of the Contract, allowing time for required inspection and punch list work.
  5. Clearly show time bar for all the tasks, to be completed before start of physical work of scheduled activities, including but not limited to obtaining required permit, subcontractor approval, submission and approval of shop drawings, field verification, time for fabrication and delivery, testing of materials and/or samples, preparation and approval of mock-up sample, curing, pre-testing of soil, pre-testing of equipment - including start up, testing & adjusting, filing for inspection by regulatory agencies, training, final use, etc. required to maintain orderly progress of the activity. A special consideration must be given to those activities requiring early approvals because of long lead-time for manufacture or fabrication.
  6. Phasing: Arrange all activities in proper sequence to reflect requirements for phased completion, work by other entities, work by the City, City furnished items, coordination with existing work, limitations arising due to continued occupancies, non-interruptible services, partial completion for occupancy, site restrictions, provisions for future work, seasonal variations, environmental control, and similar conditions of the project.
  7. Arrange all activities and/or show interrelationship and logical sequence of all activities, determine and mark all critical path activities including any phasing reflecting actual project condition.
  8. Keep at least two blank horizontal bars between all activities for recording actual progress and submitting Revised Schedule as defined in Sub-Section 1.3 G
  9. If necessary a new revised schedule shall be prepared in the same manner as outlined above.

### 2.2 COMPOSITE SCHEDULE FOR THE PROJECT:

- A. The Contractor shall prepare a Composite Schedule based on the approved Baseline Schedule. Such schedule shall indicate graphically and chronologically the start and completion of each and every activity, including all the pre-activity and post activity tasks. Keep at least two blank horizontal bars between all activities for recording actual progress and/or revisions.
1. If necessary the Contractor shall meet with each subcontractor and with the Resident Engineer to review and make warranted adjustments and finalize the Composite Schedule. Once the schedule is finalized, the Contractor shall sign and date a reproducible form of the Composite Schedule. The Composite Schedule must be finalized and signed by the Contractor within (30) thirty calendar days after the date established for commencement of the Contract, unless directed otherwise. The Composite Schedule must be reviewed and approved by the Resident Engineer.



### 2.3 RECOVERY COMPOSITE SCHEDULE:

- A. A Recovery Composite Schedule is not required unless the City issues an Acceleration Change Order. A Recovery Composite 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, must be developed and submitted within (5) five calendar days of the request by the Resident Engineer. Such Recovery Composite Schedule shall include all information as defined in Article 1.3 F and shall be prepared in the same manner as outlined in Sub-Sections 2.1 and 2.2. The Recovery Composite Schedule must be reviewed and approved by the Resident Engineer.

### 2.4 REVISED AND/OR UPDATED COMPOSITE SCHEDULE:

- A. The Contractor shall revise and/or update the approved Composite Schedule as directed. The Revised schedule shall be prepared in the same manner as outlined above in Sub-Sections 2.1 and 2.2.
- B. The Contractor shall mark actual progress, delays, work stoppage etc. in the row just below the approved schedule for the respective activity so that revisions can be compared.
- C. Such schedule also shall indicate graphically and chronologically any revisions to the start and completion of the remaining activities including revisions to all the pre-activity and post activity tasks for all subcontractors.
- D. If necessary, the Contractor shall meet with each subcontractor and with the Resident Engineer to review and make warranted adjustments and finalize the Revised Composite Schedule. Once the schedule is finalized, the Contractor shall sign and date a reproducible form of the Schedule. Such schedule must be prepared and submitted by the Contractor within Five (5) calendar days of request by the Resident Engineer. The Revised Composite Schedule must be reviewed and approved by the Resident Engineer.

### 2.5 SUBMITTALS SCHEDULE:

- A. Preparation: The Contractor shall 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.
- B. SCHEDULE F: Schedule F sets forth all submittal requirements for shop drawings and material samples. Schedule F is included in the Addendum. At the kick-off meeting, the Contractor must review this Schedule with the Resident Engineer and the Design Consultant. Within 10 days after the kick-off meeting, the Contractor must complete information on Schedule F concerning the submission date, the required delivery date and the fabrication time. For all required submittals of shop drawings and material samples, the Schedule F provided by the Contractor must indicate a submission date which is at least 20 business days prior to the date of the manufacture of the item or materials to be installed. In addition, if so directed by the Commissioner, the Schedule F provided by the Contractor must indicate a submission date for shop drawings and/or material samples of specified items or materials which is within 60 business days after the kick-off meeting. In the event of any conflict between the Specifications and Schedule F, Schedule F shall take precedence; provided, however, in the event of an omission from Schedule F (i.e., Schedule F omits either a reference to or information concerning a submittal requirement which is set forth in the Specifications), such omission from Schedule F shall have no effect and the Contractor's submittal obligation, as set forth in the Specifications, shall remain in full force and effect.
- C. Review: The Resident Engineer will review the Schedule F submitted by Contractor. Upon acceptance, the Resident Engineer will date and sign the schedule as approved and transmit it to the Consultant, Contractor and others within DDC as he/she deems appropriate.



## 2.6 REPORTS:

- A. Daily Construction Reports: The Contractor shall submit to the Resident Engineer written Daily Construction Reports at the end of each work day, 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 shall be prepared by the Contractor's Superintendent and shall bear the Contractor's Superintendents signature. Each report shall contain the following information:

1. List of 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 Completions and occupancies.
18. Substantial Completions 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 shall submit a Material Location Report at weekly OR monthly intervals as determined and established by the Resident Engineer. Such report shall include a comprehensive list of materials delivered to and stored at Project site. List shall 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.

## 2.7 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**





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No Text



**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 shall employ and pay for the services of a professional photographer who shall take photographs showing the progress of the work for all Contracts.

**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" shall 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 color prints of each photographic view for each trade to the Resident Engineer. Such photographs shall be included in each monthly progress report or as otherwise directed by the Resident Engineer.
- D. Construction Photograph Negatives: Submit a complete set of photographic negatives in individually protected negative sleeves with each submittal of prints. Identify negatives with label matching photographic prints.
- E. Digital Images: If Digital Media is used, submit a complete set of digital color image electronic files on CD-ROM with each submittal of prints. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, un-cropped.

#### 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 years.

#### 1.6 COORDINATION:

- A. The Contractor and its subcontractor(s) shall cooperate with the photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, including temporary lighting required to produce clear, well-lit photographs without obscuring shadows.

#### 1.7 COPYRIGHT:

- A. The Contractor shall include the provisions set forth below in the agreement between the Contractor and the Photographer who will provide the construction photographs described in this section. The Contractor shall 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, shall 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") shall 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 shall 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 shall retain no copyright or intellectual property interest in the Copyrightable Materials. The Copyrightable Materials shall 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 shall 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 shall be provided to the City.

## PART II – PRODUCTS

### 2.1 PHOTOGRAPHIC MEDIA:

- A. Photographic Film: Medium format, 2-1/4 by 2-1/4 inches (60 by 60 mm).
- B. Digital Images:
1. Construction Progress Images: Color images in JPEG format with minimum sensor size of 1.3 megapixels.
  2. Presentation Quality Images: Provide Color images in uncompressed TIFF format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1024 by 768 with 8"x10" original capture at 300 dpi or greater.
- 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 1inch 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 using the maximum range of depth of field, and that are 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. Film Images:
1. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.

2. Field Office Prints: Retain one set of prints of progress photographs in the field office at Project site, available at all times for reference. Identify photographs same as for those submitted to Commissioner.
- C. 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 CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Commissioner.

### 3.2 PRE-CONSTRUCTION & PRE-DEMOLITION PHOTOGRAPHS:

- A. Before commencement of Contract work at the 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 NYC 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 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 shall 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, shall 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.



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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 color photographic prints of each view as directed.

**3.5 DVD RECORDING:**

- A. When DVD Recording of Demonstration and Training sessions is required for Non-Commissioned projects the Contractor shall 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. Take color photographs of minimum eight (8) unobstructed views of the completed project or project and site, as directed by the Commissioner and after all scaffolding, hoists, shanties, field offices or other temporary work has been removed and final cleaning is done after date of Substantial Completion for submission as Project Record Documents. 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**



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No Text

PHOTOGRAPHIC DOCUMENTATION  
01 32 33 - 6

**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 shall not relieve the Contractor of responsibility for the accuracy of such Shop Drawings, nor for the proper fitting and construction of the work, nor of the furnishing of materials or work required by the Contract and not indicated on the Shop Drawings. Approval of Shop Drawings shall not be construed as approving departures from the Contract Drawings, Supplementary Drawings or Specifications.
- D. 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 DVD 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 77 00 | CLOSEOUT PROCEDURES                                |
| F. | Section 01 78 39 | CONTRACT RECORD DOCUMENTS                          |
| G. | Section 01 81 13 | SUSTAINABLE DESIGN REQUIREMENTS 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.
- B. Design Consultant: "Design Consultant" shall 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. Submittals: Written and graphic information that requires responsive actions and includes 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 information that does not require responsive action. Submittals may be rejected for non-compliance with the Contract.
- E. Shop Drawings: Include 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 shall 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. The Contractor shall provide reproducible Coordination Drawing(s) of the reflective ceiling showing the integration of all applicable contract work, including general construction work as well as trade work (Plumbing, HVAC, and Electrical) to be performed by subcontractors. The Coordination Drawing(s) shall include, without limitation, the following information:
  - 1. General Construction work showing the reflective ceiling plan including starting points, ceiling and beam soffits elevations, ceiling heights, roof openings, etc.
  - 2. HVAC Contract work showing ductwork, heating and sprinkler piping, location of grilles, registers etc. and access doors in hung ceilings. Locations shall be fixed by elevations and dimensions from column centerlines and/or walls.
  - 3. Plumbing Contract work including piping, valves, cleanouts etc., indicating locations and elevations and shall indicate the necessary access doors.
  - 4. Electrical Contract work indicating fixtures, large conduit runs, clearances, pull boxes, junction boxes, sound system speakers, etc.
- B. The Contractor shall issue the completed Coordination Drawing(s) to the Resident Engineer for his/her review. The Resident Engineer may call as many meetings as necessary with the Contractor, including



- attendance by applicable subcontractors, and may call on the services of the Design Consulting where necessary, to resolve any conflicts that become apparent.
- C. Upon resolution of any conflicts, the Contractor shall provide a final Coordination Drawing(s) which will become the Master Coordination Drawing(s). The Master Coordination Drawing(s) shall be signed and dated by the Contractor to indicate acceptance of the arrangement of the work.
  - D. A reproducible copy of the Master Coordination Drawing(s) shall be provided by the Contractor to each of the appropriate subcontractor(s); the Resident Engineer and the Design Consultant for information.
  - E. Shop Drawings shall not be submitted prior to acceptance of the final coordinated drawings and shall 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.

#### 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 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. Submittals Schedule: The Submittals Schedule is set forth in Schedule F, which is included in the Addendum.
- D. 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
- E. Transmittal:
  - 1. Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form in triplicate. Transmittals received from sources other than the

Contractor will be returned without review. Re-submission of the same drawings or product data shall bear the original number of the prior submission and the original titles.

2. Transmittal Form: Provide locations on form for the following information:
  - a. Project name, DDC Project number and Contract Number
  - b. Date
  - c. Destination (To:)
  - d. Source (From:)
  - e. Names of Contractor, subcontractor, manufacturer, and supplier
  - f. Category and type of submittal
  - g. Submittal purpose and description
  - h. Specification Section number and title
  - i. Drawing number and detail references, as appropriate
  - j. Transmittal number, numbered consecutively
  - k. Submittal and transmittal distribution record
  - l. Remarks
  - m. Signature of transmitter

F. Shop Drawings:

1. Procedures for Preparing, Forwarding, Checking and Returning all Shop Drawings shall be, generally, as follows:
  - a. The Contractor shall make available to its subcontractors the necessary Contract Documents and shall instruct such subcontractor to determine dimensions and conditions in the field, particularly with reference to coordination between the trade subcontractors. The Contractor shall direct its subcontractors to prepare Shop Drawings for submission to the Design Consultant in accordance with the requirements of these General Conditions. The Contractor shall also direct its subcontractors to "Ring Up" corrections made on all re-submissions for approval, so as to be readily seen, and that the symbol "sub" be used to identify the source of the correction or information that has been added.  
  
The Contractor shall:
    1. Review and be responsible to the Commissioner, for information shown on its subcontractor's Shop and Installation drawings and manufacturers' data, and also for 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 shall promptly prepare and submit project specific layout detail and Shop Drawings of such parts of the work as are indicated in the Specifications, Schedule F of the Addendum or as required. These Shop Drawings shall be made in accordance with the Contract Drawings, Specifications and Supplementary Drawings, if any. The Shop Drawings shall 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, shall 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 shall be numbered consecutively and shall 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 shall 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, if any, under which it is, or they are required
  - 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 shall be signed by the Contractor and, if applicable, the subcontractor responsible for preparation of the Shop Drawings. Each Shop Drawing shall 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 shall, in its statement, list and clearly describe each such discrepancy.

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.

8. Submission of Shop Drawings:

a. Initial Submission: The Contractor shall submit seven (7) copies of each Shop Drawing to the Design Consultant for his/her review and acceptance. 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 stamped "No Exceptions Taken", be dated and distributed by the Design Consultant as follows:

- 1) Two (2) copies thereof will be returned to the Contractor by letter
- 2) Three (3) copies of the approved Shop Drawing and copy of the transmittal letter to the Contractor will be forwarded to DDC
- 3) One copy will be retained by the Design Consultant
- 4) One copy will be forwarded / retained by sub-consultant(s) as appropriate

Should the Shop Drawing(s) be "Rejected" or noted "Revise and Resubmit" by the Design Consultant, the Design Consultant will return 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 submit seven (7) copies of each shop drawing to the Design Consultant. The Contractor shall 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" shall 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 shall 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 shall be transmitted to the subcontractors so affected. [These accepted Shop Drawings shall 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 shall make specific mention of such variations in its letter of submittal. Acceptance of the Shop Drawings shall constitute acceptance of the subject matter thereof only and not of any structural apparatus shown or indicated.

G. Product Data:

1. General: Except as otherwise prescribed herein, the submission, review and acceptance of Product Data and Catalogue cuts shall conform to the procedures specified in Sub-Section 1.6 F, Shop Drawings.
2. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
3. Mark each copy of each 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 shall 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 stamped "No Exception Taken", be dated and distributed as follows:
    - 1) Two (2) copies thereof will be returned to the Contractor by letter
    - 2) Three (3) copies of the Product Data and copy of the transmittal letter to the Contractor will be forwarded to DDC
    - 3) One copy will be retained by the Design Consultant
    - 4) One copy will be forwarded / retained by sub-consultant(s) as appropriateShould 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 shall 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" shall be considered an "Accepted" Product Data and NEED NOT be resubmitted.
- H. Samples of Materials:
1. For samples of materials involving electrical work of any nature, refer to Section 00 35 06 - General Electrical Requirements.
  2. Samples shall be in triplicate, of sufficient size to show the quality, type, range of color, finish and texture of the material.
  3. Each of the samples shall 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 shall be as required in the Specifications.
  7. Samples on Display: When samples are specified to be equal to approved product, they shall 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 shall 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 shall be furnished equal in every respect to the accepted samples.
  9. The Acceptance of any samples will be given as promptly as possible, and shall be only for the characteristic color, texture, strength, or other feature of the material named in such approval, and no other. When this approval 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.
  12. 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.
  13. 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 shall 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 shall 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.



**REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.7**

**1.7 LEED SUBMITTALS:**

- A. Comply with submittal requirements specified in Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL; Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS; Section 01 81 13.13, VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED BUILDINGS; Section 01 81 19, INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS and Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS.
- B. LEED Building submittal information shall be assembled into one package per each applicable specification section, separate from all other non-LEED submittals. Each submittal package shall have a separate transmittal and identification as described in Sub-Section 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 Sub-Section 1.6 of Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED PROJECTS.
  - 1. Provide the quantity, length, area, volume, weight, and/or cost of each product submitted as required to satisfy LEED documentation requirements. Refer to Sub-Section 1.6 of Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED PROJECTS.

**1.8 ULTRA-LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING:**

- A. In accordance with Section 01 10 00 Summary, Sub-Section 1.5 E, the Contractor shall 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 shall be in accordance with the schedule, format, directions and procedures established by the Commissioner.

**1.9 CONSTRUCTION PHOTOGRAPHS AND DVD RECORDINGS:**

- A. Submit construction progress photographs and DVD 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.





NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

Division 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
Issue Date - June 01, 2013  
Revised - January 15, 2015

**PART II – PRODUCTS (Not Used)**

**PART III – EXECUTION (Not Used)**

**END OF SECTION 01 33 00**

SUBMITTAL PROCEDURES  
01 33 00 - 10



**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 shall 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, as determined by the Commissioner, shall 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** -: shall mean 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 shall 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 shall 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 shall follow these Contract Drawings in laying out the work and verify the spaces in which it will be installed. The Contractor shall 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 ACCESSIBILITY:**

All work shall be installed by the Contractor so as to be readily accessible for inspection, operation, maintenance and repair. Minor deviations from the arrangement indicated on the Contract Drawings may be made to accomplish this, but they shall not be made without approval by the Commissioner.

#### **1.7 CHANGES IN PIPING, DUCTS, AND EQUIPMENT:**

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 shall make such changes as directed and approved, without extra cost to the City.

#### **1.8 CLEANING OF PIPING, DUCTS, AND EQUIPMENT:**

Piping, ducts and equipment shall 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 shall pay for repairs to other work damaged in the course of removing obstructions. For work on existing piping, ducts and equipment the Contractor shall 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:**

Unless otherwise particularly specified, all equipment of the same kind, type or classification, and used for identical purposes, shall be the product of one (1) manufacturer.

#### **1.10 SUPPORTING STRUCTURES DESIGNED BY THE CONTRACTOR:**

Unless otherwise specified, supporting structures for equipment to be furnished by the Contractor shall be designed by an Engineer licensed in New York State retained by the Contractor. Supporting structures shall be built by the Contractor of sufficient strength to safely withstand all stresses to which they may be subjected, within permissible deflections, and shall meet the following standards:

- A. Structural Steel - ASTM Standard Specifications, AISC and New York City Construction Codes.



- B. Concrete for supports for equipment shall conform to the Specifications for concrete herein, but in no case shall be less than the requirements of the New York City Construction Codes for average concrete.
- C. Steel reinforcement for concrete shall be of intermediate grade and shall meet the requirements of the Standard Specifications for Billet Steel-Concrete Reinforcement Bars, ASTM.
- D. Drawings and calculations shall 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 shall 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 shall 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 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 shall 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:**

As soon as conditions permit, the Contractor shall furnish all necessary labor and materials for, and shall 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 shall, prior to the acceptance test, make all changes, adjustments and replacements required.

**1.13 INSTRUCTIONS ON OPERATION:**

At the time the equipment is placed in permanent operation by the City, the Contractor shall make all adjustments and tests required by the Commissioner to prove that such equipment is in proper and satisfactory operating condition. The Contractor shall 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:**

On completion of the work, the Contractor shall obtain certificates of inspection, approval, acceptance and of compliance with all laws from all agencies and/or entities having jurisdiction over the work and shall deliver these certificates to the Commissioner in accordance with Section 01 77 00 CLOSEOUT PROCEDURES. The work shall not be deemed substantially complete until the certificates have been delivered. See General Comments regarding problems with specifying items required for substantial completion.

**PART II – PRODUCTS (Not Used)**

**PART III – EXECUTION (Not Used)**

**END OF SECTION 01 35 03**



NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

Division 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
Issue Date - June 01, 2013  
Revised - January 15, 2015

No Text



**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, shall take precedence.
- B. This Section includes the following:
1. Procedure for Electrical Approval
  2. Submittals
  3. Electrical Installation Procedures
  4. Electrical Conduit System Including Boxes (Pull, Junction and Outlet)
  5. Electrical Wiring Devices
  6. Electrical Conductors and Terminations
  7. Circuit Protective Devices
  8. Distribution Centers
  9. Motors
  10. Motor Control Equipment
  11. Schedule of Electrical 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:** means both wire and raceway (rigid steel, heavy wall conduit unless specifically indicated otherwise).
- B. **POWER WIRING:** means 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:** means that 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: shall mean rigid steel, heavy wall conduit that is hot dipped galvanized inside and outside. The conduit shall 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 shall be used for all exposed work, for all underground conduits in contact with earth and for fire alarms systems, as required by the New York City Construction Codes.
- E. ELECTRICAL METALLIC TUBING (EMT): shall mean industry standard thin wall conduit of galvanized steel only. All elbows, bends, couplings and similar fittings which are installed as a part of the conduit system shall be compatible for use with electric metallic tubing. Couplings and terminating fittings shall be of the pressure type as approved by the Commissioner. Set screw fittings will not be acceptable. EMT shall 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): Shall mean 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 shall 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 Sub-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 shall 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 shall 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 shall be made as required by the Commissioner of all electrical materials, electrical and associated mechanical equipment, and of appliances installed hereunder. The Contractor shall 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, the Contractor on written notice shall remove and promptly replace them with other materials in conformity with the Contract.
- D. CERTIFICATE OF THE BUREAU OF ELECTRICAL CONTROL, OF THE DEPARTMENT OF BUILDINGS (B.E.C.): The Contractor must file prior to requesting a substantial completion inspection a Certificate of Inspection issued by B.E.C. On completion of the work the Contractor shall obtain certificates of inspection, approval, acceptance and compliance from all agencies and/or entities having jurisdiction over the work and shall 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 shall be responsible for the equipment until it has been finally inspected, tested and accepted, in accordance with the requirements of the Contract.



2. After delivery and before and after installation, the Contractor shall protect all equipment against theft, injury or damage from all causes. The Contractor shall carefully store all equipment received for work, which is not immediately installed. If any equipment has been subject to possible injury by water, it shall 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, shall be made by the same manufacturer.

**1.6 SUBMITTALS:**

**A. CONTRACTOR'S ELECTRICAL DRAWINGS AND SAMPLES FOR APPROVAL:**

1. The Contractor shall 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 shall be included. A letter, in triplicate, shall accompany each submittal.
2. The Contractor shall 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 shall 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 shall 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 shall submit statement in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.

- D. **BULLETINS AND INSTRUCTIONS:** The Contractor shall 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 shall 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 shall 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 accessibility for repairs, even though this selection is the most costly.
- 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, shall be furnished and set by the Contractor installing the conduits. Sleeves in waterproofed floors shall be provided with flashing extending 12 inches in all directions from sleeve and secured to waterproofing. Flashing shall be turned down into space between pipe and sleeve and caulked watertight. Flashing shall be 20 oz. cold rolled copper. Sleeves shall be supplied with welded flanges similar to those supplied by the subcontractor for Plumbing Work and shall extend one (1) inch above finished floor.
- D. **COORDINATION:** The Contractor shall keep in close touch with the construction progress and obtain the necessary information for the accurate placement of its work in ample time 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 shall be repaired or replaced by the Contractor. The Contractor shall 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 shall 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, shall furnish this unit complete with internal wiring, connections, terminal boxes with copper connectors and/or lugs and ample electrical leads, ready for connection and operation. The cost of any wiring, re-wiring or other work required to be done on this unit in the field, shall 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 shall 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 shall be used throughout, unless otherwise directed by the Commissioner. Where the word 'conduit', without a modifier such as, rigid steel, EMT, etc., is specified to be used, it shall 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 shall be installed concealed in finished spaces.
2. **CONDUIT SIZES:** The sizes of conduit shall be as indicated on the Contract Drawings. Wherever conduit sizes are not indicated, the conduit shall meet the requirements of the New York City Electrical Code to accommodate the conductors to be installed therein.
3. Conduits shall be reamed smooth after cutting. No running threads will be permitted. Universal type couplings shall be used where required. Conduit joints shall be screwed up to butt. Empty conduits after installation shall have all open ends temporarily plugged to prevent the entrance of water or other foreign matter.
4. Conduits being installed in concrete or masonry shall be securely held in place during pouring and construction operations. A group of conduits terminating together shall be held in place by a template.
5. **UNDERGROUND STEEL CONDUITS:** Unless otherwise specified, all underground steel conduits in contact with earth shall 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 shall 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 shall perform the work of cutting pavement, excavation shoring, keeping trenches and holes pumped dry, backfilling, restoration of surfaces to original condition and removal of excess earth and rubbish from premises. During the work, the Contractor shall 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 shall secure and pay for all necessary permits and inspection fees and pay the cost of repaving.
7. **EXPOSED CONDUIT SUPPORTS:** Exposed conduit shall be supported by Galvanized hangers with necessary inserts, beam clamps of approved design or attached to walls or ceilings by expansion bolts. Exposed conduits shall be supported or fastened at intervals not more than five (5) feet.
8. Exposed conduit shall be installed parallel or at right angles to ceiling, walls and partitions. Where direction changes of exposed conduit cannot be made with neat bends, such as required around beams or columns, conduit type fitting shall be used.

9. The conduit shall be installed with an approved expansion joint:
  - 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. Conduit may only enter and leave a floating slab in the vertical direction, and then only in an approved manner. Horizontal entries into floating slabs are not permitted.
11. Conduit installed in pipe shafts shall 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 shall be provided to assure stability of the raceway system.
12. BUSHINGS AND LOCKNUTS: Approved bushings and locknuts shall be used wherever conduits enter outlet boxes, switch boxes, pull boxes, panel board cabinets, etc.
13. CONDUIT BENDS: shall be made without kinking conduit or appreciably reducing the internal diameter. All bends in conduit of two (2) inch in diameter or larger shall be made with a hydraulic or power pipe bender. The radius of the inner edge of any bend shall 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 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 shall 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 shall be turned to approximately 85% of the internal diameter of the raceway to be tested. Two (2) short wire brushes shall be included in the mandrel assembly. Snaking of conduits, ducts, etc., shall be performed by the Contractor in the presence of the Resident Engineer. Any conduits or ducts which reject the mandrel shall 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 shall be assigned to the various conduit runs, and as they test clear they shall 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 shall be tagged.
  - c. TEST RECORDS: As the conduit runs clear, a record shall 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 shall be signed by the Resident Engineer and submitted in triplicate for approval. This record shall be entered on the Contract Record Drawings under Section 01 78 39, CONTRACT RECORD DOCUMENTS.
  - d. CAPPING: All empty conduit and duct openings, after test, shall be capped or plugged by the Contractor as directed.
  - e. DRAG LINES: A drag line shall be left in all empty conduit.

**B. BOXES:**

1. The Contractor shall furnish and erect all pull boxes indicated on the plans or where required. Sides, top and bottom of pull boxes shall be Galvanized coated and shall 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 shall be removable and held in place by corrosion resistant machine screws. Pull boxes in damp locations shall have threaded hubs and gaskets and be NEMA 4X. All pull boxes shall 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 shall be supported from the black iron or structure.
3. The exact location of all outlets in finished rooms shall be as directed. When the interior finish has been applied, the Contractor shall make any necessary adjustment of its work to properly center the outlets. All outlet boxes for local switches near doors shall be located at the strike side of doors as finally hung, whether so indicated on the drawings or not.
4. Exposed wall outlet boxes shall be erected neatly and tight against the walls and securely anchored to same.
5. All wall outlets of each type shall be set accurately at the same level on each floor, except where otherwise specified or directed. Where special conditions occur, outlets shall 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
  - 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 shall be of approved design and construction; of form and dimensions suited and adapted to its specific location; the kind of fixture to be used and the number and arrangements of conduits, etc., connecting therewith. All ferrous outlet boxes shall meet the requirements for zinc coating as specified under Electrical Conduit Systems.
8. There shall be knockouts opened only for the insertion of conduit. Any outlet boxes with more openings than are necessary for conduit insertion shall be sealed by the Contractor without additional charge.
9. All outlet boxes and junction boxes for exposed work shall be galvanized cast iron or cast aluminum with threaded openings. Outlet boxes for exposed inside work in damp locations shall be galvanized cast iron or cast aluminum with threaded hubs and neoprene gaskets.
10. Junction boxes shall not be less than 4 11/16" square and shall be equipped with zinc coated plates. Where plates are exposed they shall be finished to match the room decor.

11. **FIXTURE SUPPORTS:** Outlet boxes supporting lighting fixtures shall be equipped with fixture studs held by approved galvanized stove bolts or integral with the box. Cast iron or malleable boxes shall have four (4) tapped holes for mounting required cover or fixtures.
12. Outlet boxes exposed to the weather or indicated W.P. shall be cast iron or cast aluminum and the covers made watertight with neoprene gaskets. The boxes shall have external lugs for mounting. Drilling of the body of the fitting for mounting will not be permitted. The cover screws shall 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** shall be of the best specification grade, quiet type, and shall have a rating of 20 Amperes at 277 volts, as manufactured by Bryant, Hubbell or approved equal. The mechanism shall be equipped with arc snuffers. They shall be of the tumbler type, single pole. Switches of the 3-way type shall have a similar rating.
- B. **RECEPTACLES:**
  1. **CONVENIENCE OUTLETS:** shall be of the best specification grade, duplex, two-pole, 3-wire, 20 Amperes at 125 volts. It shall have a grounding pole that shall be grounded to the conduit system. Receptacles shall be capable of both back and side wiring and shall have only one (1) grounding screw. Receptacles shall be Hubbell Cat. #5262 or approved equal.
  2. **HEAVY DUTY RECEPTACLE OUTLETS:** shall have the Ampere rating and the number of poles specified on the Contract Drawings and shall be Hubbell, Russell-Stoll, Bryant, AH & H or approved equal. Each outlet shall have a grounding pole, which shall be grounded to the conduit system.
  3. **FLOOR RECEPTACLES:** shall 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 shall 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 shall be in a gasketed, cast iron enclosure.
- E. **PLATES:**
  1. Every convenience outlet and switch outlet shall 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 shall 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 shall be of annealed copper of 98% conductivity. Aluminum wire or cable will not be permitted. The insulation shall be flame retardant, moisture and heat resistant, thermoplastic, type THW or THWN rated for 600 volts at 75 degrees C. for



both wet and dry locations. Wires No. 8 or larger shall be stranded. Wires and cables shall also be subject to the requirements of the NYCEC. Cables for incoming service or wire in conduits contiguous with the earth or in concrete or other damp or wet locations shall be synthetic rubber insulated with neoprene jacket, heat and moisture resistant and shall 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 shall 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 shall not be used for light or power.
- E. **COLOR CODE:** Wires shall have a phase color code, and multiple conductor cables shall be color coded.
- F. **CABLE DATA:** The Contractor shall 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 shall 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 shall not be installed in conduit before the rough plastering work is completed. No conductors shall be pulled into floor conduits before floor is poured.
  - 2. **CONDUIT SECURED IN PLACE -** No conductor shall 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 shall be left with sufficiently long ends for proper connection and stowing.
  - 4. **PULLING COMPOUNDS -** When required to ease the pulling-in of wires into conduit, only approved compounds as recommended by cable manufacturers shall be used.
  - 5. **PRESSURE CONNECTORS -** for wires shall be of the cast copper or forged copper pressure plate type. Connectors shall be O.Z., Burndy, National Electric Products or approved equal.
  - 6. **Splices and feeder taps in the gutters of panel boxes shall 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, shall 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 shall be as approved by the connector manufacturer.**



- b. For wire and cable No. 6 AWG and larger for branch circuit wiring the seamless tubular connector will only be accepted. Application of this connector shall be with a tool recommended by the connector manufacturer.
  9. TAGS: All feeders and risers shall be tagged at both ends, and in all pull and junction boxes and gutter spaces through which they pass. Such tags shall be of fiber and have the feeder designation and size stamped thereon.
  10. BRANCH CIRCUIT WIRING:
    - a. The Contractor installing branch circuit wiring shall test the work for correct connections and leave all loop splices in the fixture outlet boxes properly spliced and taped. The Contractor shall provide wire ends long enough for convenient connection to device.
    - b. NEUTRALS: No common neutrals shall be used except for lighting branch circuits. Each neutral wire shall 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 shall 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 shall be cast copper or forged copper pressure plate type. Lugs for 1/0 and larger shall be fastened with two (2) bolts.
  2. All lugs shall 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 insure 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: shall be operable in any position and shall be of the quick-make, quick-break type on manual operation. The handle shall 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 shall be provided, in addition to the "On" and "Off" indication. All circuit breakers shall be of the bolted type.
2. TRIP RATING: Circuit breakers shall 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 shall be designed to break all poles simultaneously. They shall be provided with barriers between poles and arc suppressing devices.
4. ELEMENTS: Multipole circuit breakers shall have frames of not less than a 100 Ampere rating. Multipole circuit breakers for 480 volts AC operation shall have an NEMA interrupting rating of 18,000 Amperes, unless a higher rating is specified in the Specific Requirements 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 shall be provided with interchangeable trip elements, which can be replaced readily.
6. Single pole circuit breakers for branch circuits shall have a frame size of no less than 100 Amperes, and shall 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 shall 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 shall 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 shall insure constant calibration and be capable of withstanding excessive short circuit conditions without injury.
9. CONTACTS: shall be non-welding under operating conditions and of the silver to silver type.
10. TEMPERATURE RISE: Current carrying parts, except thermal elements, shall not rise in temperature in excess of 30 degrees C. while carrying rated current at rated frequency.
11. NUMBERING: Each circuit breaker shall be distinctly numbered when installed in a group with other breakers. The calibration of trip element shall 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 shall be of the type HD of a rating not less than 30 Amperes. Enclosures shall be provided with means for locking. For ratings above 60 Amperes terminals shall 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. PANELBOARDS-GENERAL TYPE: The panel boards shall be of the automatic circuit breaker type with individual breakers for each circuit, removable without disturbing the other units. Circuit breakers shall be in accordance with the requirements outlined under "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 shall be distinctly numbered.
- C. BUS-BAR CONSTRUCTION AND SUPPORT: Panel Boards shall be of the dead front type and shall have bus bars and branch circuits designed to suit the system and voltage. Current carrying parts, exclusive of circuit breakers shall be copper and based on a maximum density of 1,000 Amperes per square inch. Bus bars for the main switchboard shall be designed for the frame rating of the Service Breaker. Bus bars shall run up the center of the panel, unless otherwise indicated, and shall have connected thereto the various branch circuits. Unless otherwise specified, bus bars for each panel board shall be equipped with main lugs only and capacity as required on Contract Drawings. Where main protection is required, automatic circuit breakers shall be used. A neutral bus of at least the same capacity as a live bus bar shall be provided for the connection of all neutral conductors. Each terminal shall be identified. All current carrying parts, exclusive of circuit breakers, shall be of copper with a minimum number of joints. The bus bar structure shall be a self-supporting unit, firmly fastened to a ½



- inch plastic board, extending the full length and width of assembly which shall 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 shall separate neutral bus from other parts of panel.
- D. **CIRCUIT BREAKER ASSEMBLY:** The entire circuit breaker and bus bar assembly shall be mounted on an adjustable metal base or pan and secured to the back of panel box. The panel shall have edges flanged for rigidity.
- E. **PANEL MOUNTING:** The panel shall be centered in the panel box to line up with door openings and set level and plumb so that no live parts are exposed with the door open.
- F. **PANEL CABINET:**
1. **PANEL CABINET INSTALLATION:** When installed surface mounted in panel closets they shall be mounted on Kindorf channel.
  2. Where cabinets cannot be set entirely flush due to shallow walls or partitions or where cabinet is extra deep, the protruding sides of cabinet shall 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:** Nameplates where required, shall be made of engraved Lamicoide sheet, or approved equal. Letters and numbers shall be engraved white on a black background (except for Firehouse projects which shall have white letters on a red background). The Contractor shall submit an engraved sample for approval as to design and style of lettering before proceeding with the manufacture of the nameplate. Nameplates shall be of suitable size and shall 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 shall 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., shall be submitted for approval.
- I. **DIRECTORIES:** A directory shall 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 shall be typewritten and show the number of each circuit, the name of circuit and lighting or equipment supplied. The size of riser feeder shall be as indicated on directory. The dimensions of directory shall be submitted for approval for each size of panel.
- J. **CONSTRUCTION**
1. **FINISH:** Panel boxes, doors and trim for installation in dry locations, shall be zinc coated after fabrication by the hot-dip galvanizing or electroplate process on inside and outside surfaces. In damp locations, panel boards shall be enclosed and gasketed NEMA 3R type. Panel boards located outdoors or exposed to the weather shall be NEMA 3X type.
  2. **PAINTING:** Panel boxes, doors and trim shall receive a coat of approved priming paint and a second coat of approved paint in the field after installation. Paint shall be applied to the inside and outside of boxes and on both sides of trim. Panel trims and doors shall 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 shall apply to all motors furnished in the Contract.

- A. **MOTOR DESIGN:** All motors shall 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 shall prevail. Motors shall have standard NEMA frames and shall have nameplate ratings adequate to meet the specified conditions of operation. Motor performance under variable conditions of voltage and frequency shall be within the limits set in NEMA standards, unless modified in the Specifications. Motors shall be expressly designed for the hazard duty load, voltage and frequency as specified in the Contract. All motor windings shall be copper. All motors intended to operate on a 208 volt system shall 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 shall be considered as a standard for comparison. The requirements of the NEMA standards for motors and generators shall 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 shall bear a nameplate lettered "Quiet Motor." Springs and slip rings shall be of approved non-ferrous material.
- D. **BEARINGS:**
1. Bearings, unless specified otherwise, shall be of the ball or roller type. Motors one (1) horsepower and larger that are equipped with ball roller bearings shall also have lubrication of the pressure-relief greasing type. The Contractor furnishing four (4) or more such motors shall also furnish, as part of the Contract, a pressure grease gun of rugged design, of approximately 10 ounce capacity, complete with necessary adapters. The Contractor shall also provide 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 shall in addition to having protected accessible fittings for oiling be provided with visible means for determining normal oil level. Lubrication shall be positive, automatic and continuous.
- E. **MOTOR TERMINALS AND BOXES:** Each motor shall 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 shall be furnished of ample size to make and house motor connections. These requirements shall be met irrespective of any other standards or practices. Size of cable terminals and conduit terminal box holes shall be subject to approval. For motors five (5) horsepower or larger, each terminal shall 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 shall be of cast iron with threaded hubs and gasketed covers. Cover screws shall be of non-corrosive material.
- F. **MOTOR TEMPERATURE RISES:** The motor nameplate temperature rises for the various types of motor enclosures shall 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 shall meet the requirements of NEMA standards for the size and type of the motors. Tests for heating shall 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 shall comply in design and safety features with such applicable codes, regulations and rulings, and shall 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 shall not exceed 1/4 horsepower.
- I. MOTORS RATED: 1/2 horsepower and larger shall 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 shall 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 shall 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 breaker, magnetic starter 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 shall furnish as many of these items as are 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 shall 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 30 horsepower, shall have magnetic across the line starters; motors rated above 30 horsepower shall be furnished with reduced voltage (autotransformer type) starter or part winding start with time delay to reduce inrush current. Size of starters shall be based on 200V operation.
  2. SLIP RING: A.C. Motors of the slip-ring type shall be furnished with primary across the line starters interlocked with secondary starting and regulating equipment. The interlocking feature shall 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 1/2 horsepower or more, magnetic starters and circuit breakers shall be used. Single phase A.C. motors smaller than 1/2 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 shall be provided.

- D. **DISCONNECTING BREAKER:** All motor starters, unless otherwise specified, shall 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 shall be contained in the same housing with the starter and shall be operable from outside. Means shall 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 shall 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 shall be provided.
- G. 1. **PANELS:** Motor control devices and appliances shall be mounted on approved insulating slabs with all wiring and connections made on the back of the slabs.
2. **WIRING AND TERMINALS:** Wiring connections for currents of 100 Amperes or less may be made with copper wire or cable with special flameproof insulating coverings. Such wires shall be installed in a neat workmanlike manner, flat against the slab, and held in place by clips. Connections shall 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 shall 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.
3. **COPPER BUS:** For currents exceeding 100 Amperes, copper bus shall be used in place of wires. The bus shall 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 shall provide sufficient areas to keep current density at not more than 1,000 Amperes per square inch.
- H. **COOPERATION:** The Contractor's subcontractor(s) who furnish electrically operated equipment shall 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.
- I. **SPARE PARTS:**
1. **FURNISH:** The Contractor shall furnish the following spare parts pertaining to equipment furnished by each subcontractor.
- One (1) set of contact fingers and springs and thermal elements for each three (3) (or fraction) of each size of magnetic contactor starter.
- One (1) holding coil for each three (3) (or fraction) of each size of magnetic contactor starter.
2. **WRAPPER MARKING:** All parts shall be delivered to the Resident Engineer neatly wrapped and boxed and plainly tagged and marked for identification and reordering.

END OF SECTION 01 35 06



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GENERAL ELECTRICAL REQUIREMENTS  
01 35 06 - 16



**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 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" shall 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 and one or more safety representatives, Commissioner's designated representatives and other concerned parties for the purpose of reviewing the Contract Safety requirements. The Contractor's safety requirements shall be reviewed, and implementation of safety provisions pertinent to the Work shall 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 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. Work shall additionally 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 submit copies of shipping manifests and permits from applicable federal, state or local authorities and disposal facilities, and submit certificates that the material has been disposed of in accordance with regulations to the Resident Engineer.
- 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 Bureau of Environmental and Geotechnical Services (BEGS) through the Resident Engineer.
- E. Request for Subcontractor Approval: Any subcontractor performing environmental work shall submit required documentation for approval to perform such work as required by DDC's BEGS.

## PART II – PRODUCTS

### 2.1 PERSONNEL PROTECTIVE EQUIPMENT:

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 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.
- B. The Commissioner shall determine whether the Contractor shall perform tests to determine if the material is hazardous. 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 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. Temporary protection of historic materials during construction
  3. General Protection
  4. Protection during use of heat-generating equipment
  5. Photographic Documentation
  6. 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" shall 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. 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 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 work.
- B. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of work, submit for Commissioner's approval a written description including evidence of successful use on other comparable projects, and program of testing to demonstrate effectiveness for use on this Project.
- C. 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. Special Experience Requirements: Special Experience Requirements may apply to the firm that will provide Historic Treatment Services. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.
- 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 PROTECTION, GENERAL:**

- A. Comply with manufacturer's written instructions for precautions and effects of products and procedures on adjacent building materials, components, and vegetation.
- B. Ensure that supervisory personnel are present when work begins and during 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 shall 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 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 Commissioner immediately of drains or systems that are stopped or blocked. Do not begin Work of 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 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 shall 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 shall be given for each occurrence and location of work with heat-generating equipment.
  - 2. As far as practical, 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 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 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:**

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:**

For all projects involving a Landmark Structure or Site, the Contractor, at the completion of the work, shall 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 shall 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 New York City 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:
- a. Definitions
  - b. Conflicting Requirements
  - c. Quality Assurance
  - d. Quality Control
  - e. Approval of Materials
  - f. Special Inspections (Controlled Inspection)
  - g. Inspections by Other City Agencies
  - h. Certificates of Approval
  - i. Acceptance Tests
  - j. 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 Document requirements.
- D. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
- E. Provisions of this Section do not limit requirements for the Contractor to provide quality-assurance and -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 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, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS."
- H. 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 shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS. The Contractor shall 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" shall 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. 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.

**1.5 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 shall comply with the most stringent requirement as determined by the Commissioner. The Contractor shall 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 shall 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 shall refer any uncertainties to the Commissioner for a decision before proceeding.

**1.6 QUALITY ASSURANCE:**

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required. Individual Specification Sections specify additional requirements.
- B. Installer Qualifications: Special Experience Requirements may apply to the firm that will install, erect or assemble specified work required for the Project. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.
- C. Manufacturer Qualifications: Special Experience Requirements may apply to the firm that will manufacture equipment, products or systems specified for the Project. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.



- D. Fabricator Qualifications: Special Experience Requirements may apply to the firm that will fabricate material, products or systems specified for the Project. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.
- E. Professional Engineer Qualifications: A professional engineer who is licensed 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 this Project in material, design, and extent.
- F. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- G. 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 Resident Engineer.
  - 2. Notify Resident Engineer 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 Design Consultant'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.

#### 1.7 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.
  - 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 shall provide quality-control services as set forth in the Specifications and those required by Authorities having jurisdiction. The Contractor shall provide quality-control services 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 shall be borne by the Contractor and shall be deemed to be included in the Contract price. The Contractor shall 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 shall 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 shall not employ same entity engaged by the City, unless agreed to in writing by the Commissioner.
  4. The Contractor shall notify testing agencies and the Resident Engineer 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 shall submit a certified written report, in triplicate to the Commissioner, of each quality-control service.
  6. Testing and inspecting requested by the Contractor and not required by the Contract Documents are Contractor's responsibility.
  7. The Contractor shall 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 shall engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Results shall be submitted in writing as specified in Section 01 33 00 SUBMITTAL PROCEDURES.
- D. **Retesting/Re-inspecting:** Regardless of whether the original tests or inspections were the Contractor's responsibility, the Contractor shall provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. **Associated Services:** The Contractor shall cooperate with entities performing required tests, inspections, and similar quality-control services, and shall provide reasonable auxiliary services as requested. The Contractor shall 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.
- F. **Coordination:** Coordinate sequence of 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.
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.
- G. **Manufacturer's Directions:** Where the Specifications provide that the manufacturer's directions are to be used, such printed directions shall be submitted to the Commissioner.
- H. **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 shall be subject to prior written approval by the Commissioner.
1. **NOTICE** - The Contractor shall 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 shall 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.

- I. No Shipping Before Inspection: The Contractor shall comply with the foregoing before shipping any material.
- J. Certificate of Manufacture: When the Commissioner so requires, the Contractor shall 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 shall 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 B.S.A., M.E.A., B.E.C. Advisory Board, etc.
- K. Acceptance: When materials or manufactured products shall comprise 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.
- L. Testing Compliance: The testing personnel shall make the necessary inspections and tests, and the reports thereof shall 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.
- M. Reports: Six (6) copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Commissioner as a prerequisite for the acceptance of any material or equipment.
- N. 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.
- O. Furnish Designated Materials: Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Specifications, the Contractor shall immediately proceed to furnish the designated material or equipment.

#### 1.8 APPROVAL OF MATERIALS:

- A. Local Laws: All materials, appliances and types or methods of construction shall be in accordance with the Specifications and shall in no event be less than that necessary to conform to the requirements of the New York City 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 shall 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 shall have a plant of ample capacity and shall have successfully produced similar products. All approvals of materials or equipment that are legally required by the New York City Construction Codes and other governing Authorities must be obtained prior to installation.
- C. All Materials: Fixtures, fittings, supplies and equipment furnished under the Contract shall 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 shall 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 shall inform the manufacturer or dealer of all the General Conditions and requirements herein contained.

#### 1.9 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 New York City Construction Codes, shall 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 shall be an entity compliant with the requirements of the New York City Construction Codes. The Contractor shall 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 shall 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 shall notify the relevant Special Inspector in writing at least 72 hours before the commencement of any work requiring Special Inspection. The contractor shall be responsible for, and bear related costs to assure that all construction or work shall remain accessible and exposed for inspection purposes until the required inspection is completed.
4. Inspections and tests performed under "Special Inspection" shall 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.

#### 1.10 INSPECTIONS BY OTHER CITY AGENCIES:

- A. Letter of Completion: Just prior to substantial completion of this 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.

#### 1.11 CERTIFICATES OF APPROVAL:

- A. Responsibility: The Contractor shall be responsible for and shall 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 shall be forwarded to the Commissioner through the Resident Engineer.



#### 1.12 ACCEPTANCE TESTS:

- A. Government Agencies: All equipment and appliances furnished and installed under the Contract shall conform to the requirements of the Specifications, and shall 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 shall give written notice to all concerned 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 shall 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 shall 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 shall only proceed as directed by the Resident Engineer. Additional costs resulting from retesting, re-inspecting, replacing of material and/or damage to the work and any delay caused to the schedule shall 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 shall 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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No Text

QUALITY REQUIREMENTS  
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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 shall mean and intend approved, acceptable or satisfactory to the Commissioner.
- C. Design Consultant: "Design Consultant" shall 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.
- 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 shall, 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.D.A.A.G.	Americans with Disabilities Act (ADA) – Architectural Barriers Act (ABA)
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 – includes: New York City Plumbing Code New York City Building Code New York City Mechanical Code New York City Fuel Gas Code
N.Y.S.D.O.L	New York State Department of Labor
N.Y.C.D.E.P	New York City Department of Environmental Protection
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 shall 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 New York City Construction Codes adopts a different or earlier dated version of such standard.
- 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



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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
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)
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
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)

REFERENCES  
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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 (American Society for Testing and Materials International)
AWCI	AWCI International (Association of the Wall and Ceiling Industry International)
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)

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BICSI	BICSI
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
BISSC	Baking Industry Sanitation Standards Committee
CIBSE	Chartered Institute of Building Services Engineers
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Canadian Electricity Association
CFFA	Chemical Fabrics & Film Association, Inc.
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)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)



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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



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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
ILI	Indiana Limestone Institute of America, Inc.
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

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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
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
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



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NGA	National Glass Association
NHLA	National Hardwood Lumber Association
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
NRMCA	National Ready Mixed Concrete Association
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)





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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)
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
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TCA	Tile Council of America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society

REFERENCES  
01 42 00 -10



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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 <b>Council</b> (Formerly: WCMA - Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door 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**

REFERENCES  
01 42 00 -11



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REFERENCES  
01 42 00 -12



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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:
  - a. Temporary Water System
  - b. Temporary Sanitary Facilities
  - c. Temporary Electric Power, Temporary Lighting System, And Site Security Lighting
  - d. Temporary Heat
  - e. Dewatering Facilities And Drains
  - f. Temporary Field Office for Contractor
  - g. Resident Engineer's Office
  - h. Material Sheds
  - i. Temporary Enclosures
  - j. Temporary Partitions
  - k. Temporary Fire Protection
  - l. Work Fence Enclosure
  - m. Rodent and Insect Control
  - n. Plant Pest Control Requirements
  - o. Project Identification Signage
  - p. Security Guards/Fire Guards on Site
  - q. Project Sign and Rendering
  - r. 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.
- B. Permanent Enclosure: As determined by 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.

- C. Design Consultant: "Design Consultant" shall 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.

**1.5 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 shall 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. Install, operate, maintain and protect temporary facilities, services and controls.
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.
  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 shall provide the temporary services, facilities and controls set forth in this Section during other than regular working hours if the Drawings and/or the Specifications indicate that the Work, or specific components thereof, must be performed during other than regular working hours. In such case, all costs for the provision of temporary services, facilities and controls during other than regular working hours shall be deemed included in the total Contract Price.
- B. The Contractor shall provide the temporary services, facilities and controls set forth in this Section during other than regular working hours if a change order is issued directing the Contractor to perform the Work, or specific components thereof, during other than regular working hours. In such case, compensation for the provision of temporary services, facilities and controls during other than regular working hours shall be provided through the change order.

**1.8 SERVICES BEYOND COMPLETION DATE:**

- A. The Contractor shall 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 punch list work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. The Contractor shall 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. Provide undamaged materials in serviceable condition and suitable for use intended.
- B. Tarpaulins: Waterproof, fire-resistant UL labeled with flame spread rating of 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 Department of Environmental Protection.

### 2.2 EQUIPMENT:

- A. Provide undamaged equipment in serviceable condition and suitable for use intended.
- B. Water Hoses: Heavy-duty abrasive-resistant flexible rubber hoses, 100 feet (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 will 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. 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. Provide each facility ready for use when needed to avoid delay. Do 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 shall furnish a Temporary Water System as set forth below.
  - 1. Immediately after the Commissioner has issued an order to start work, the Contractor shall file an application with the Dept. of Environmental Protection 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 work, the Contractor shall file an application with the Department of Environmental Protection's Bureau of Water Supply and obtain a permit to install the temporary water supply system. The system shall be installed and maintained for the use of the Contractor and its subcontractors. A copy of the above mentioned permit shall be filed with the Commissioner. The Contractor shall 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 shall 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 shall take the necessary precautions to prevent the temporary water system from freezing. The Contractor shall 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 shall 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 shall 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 shall restore the existing water system to conditions existing before initial use.
2. The Contractor shall be responsible for all repairs to the existing water system permitted to be used for temporary water service during construction. The Contractor shall 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 Department of Environmental Protection schedule of charges for Building Purposes.

**C. WASH FACILITIES:** The Contractor shall 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.

1. Dispose of drainage properly.
2. Supply cleaning compounds appropriate for each condition.
3. Include safety showers, eyewash fountains and similar facilities for the convenience, safety and sanitation of personnel.

**D. DRINKING WATER FACILITIES:** The Contractor shall provide drinking water fountains or containerized tap-dispenser bottled-drinking water units, complete with paper cup supplies. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg. F (7 to 13 deg. C).

**3.3 TEMPORARY SANITARY FACILITIES:**

- A. The Contractor shall 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 shall provide temporary single-occupant toilet units of the chemical, aerated recirculation, or combustion type for use by all construction personnel. Units shall be properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material. Quantity of toilet units shall comply with the latest OSHA regulations.
2. Toilets: 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 shall arrange for the use of existing toilet facilities by all personnel during the execution of the work. The Contractor shall be responsible to clean and maintain facilities in a condition acceptable to the Resident Engineer and, at completion of construction, to restore facilities to their condition at the time of initial use.
2. **MAINTENANCE** - The Contractor shall maintain the temporary toilet facilities in a clean and sanitary manner and make all necessary repairs.
3. **NUISANCES** - The Contractor shall not cause any sanitary nuisance to be committed by its employees or the employees of its subcontractors in or about the work, and shall 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 shall 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 shall 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 shall be provided as follows: The Contractor shall make all necessary arrangements with the Public Utility Company and pay all charges for the Temporary Electric Power system. The Contractor shall 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 shall make payment directly to the Public Utility Company.
  - b. **APPLICATIONS FOR METER:** The Contractor shall make 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 shall 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 shall 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 shall be not less than 100 Amperes, 3-phase, 4-wire and shall be of sufficient capacity to take care of all demands for all construction operations and shall meet all requirements of the NYCEC.



**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 shall 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 shall 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 shall 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 shall 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 shall 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 shall be responsible for all costs due to this change over of service and it shall 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 shall 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 shall be under the supervision of the Contractor, but this shall 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 shall 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 shall provide adequate service for the temporary lighting system, or a minimum of 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 shall 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 shall be located near entrance on ground floor.
  3. ITEMS: The Temporary Lighting System provided by the Contractor shall 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 shall 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, 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, shall be borne by the Contractor.
  6. PIGTAILS: shall be furnished with left-hand sockets with locked type guards and 40 feet of rubber covered cable. The Contractor shall 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 shall 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, shall be replaced by the Contractor. All lamps shall be compact fluorescent.
  8. CIRCUIT PROTECTION: The Contractor shall furnish and install GFI protection for the Temporary Lighting and Site Security Lighting Systems.
  9. MAINTENANCE OF TEMPORARY LIGHTING SYSTEM:
    - a. The Contractor shall maintain the Temporary Lighting System in good working order during the scheduled hours established.
    - b. The Contractor shall 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 shall be removed by the Contractor when authorized by the Commissioner.
  11. HAND TOOLS: The temporary lighting system shall 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 (FOR NEW CONSTRUCTION ONLY):
1. The Contractor shall furnish, install and maintain a system of site security lighting, as herein specified, to illuminate the construction site of the project, and it shall be connected to and energized from the Temporary Lighting System. All costs in connection with site security lighting shall 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 shall direct its subcontractors to cooperate, coordinate and exert every effort to accomplish an early complete installation of the site security lighting system. After the system is installed and in operation, if a part of the system interferes with the work of any trade, the Contractor shall 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 shall consist of flood lighting by pole mounted guarded sealed-beam units. Floodlight units shall be mounted 16 feet above grade. Floodlights shall 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 shall be installed in a manner acceptable to the Resident Engineer. The first lighting unit in each circuit shall be provided with a photoelectric cell for automatic control. The photoelectric cell shall be installed as per manufacturer's recommendations.
  4. All necessary poles shall be furnished and installed by the Contractor.
  5. The site security lighting shall be kept illuminated at all times during the hours of darkness. The Contractor shall, at its own expense, shall keep the system in operation, and shall furnish and install all material necessary to replace all damaged or burned out parts.
  6. The Contractor shall be on telephone call alert for maintaining the system during the operating period stated above.
  7. All materials and equipment furnished under this section shall remain the property of the Contractor and shall 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 shall mean 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 shall include the provision of heat to permit normal operations in such occupied areas.
  - a. The provision of Temporary Heat shall be in accordance with the temperature requirements set forth in Sub-Section 3.5 C herein.
  - b. The provision of Temporary Heat shall 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 shall mean that minimum force required for the safe day to day operation of the system for the provision of Temporary Heat and shall include, without limitation, heating maintenance labor and/or Fire Watch as required by NYC Fire Department regulations. Operating labor may be required seven (7) days per week and during other than normal 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 shall include the provision of domestic hot water at the same temperature as the system which is being replaced. Domestic hot water shall 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, shall be as set forth below:
  - a. Projects Involving Enclosure of the Building:



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- 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 shall be 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 shall be 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 shall, 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 shall provide Temporary Heat in accordance with the approved plan until written acceptance by the Commissioner of the work of all Contractors, 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 shall 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 shall be responsible for the provision of Temporary Heat and shall 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 shall notify all its subcontractors and the Resident Engineer at least 30 days prior to the anticipated date that the building(s) will be enclosed.
  2. Commissioner Determination: The Commissioner shall 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 shall be responsible for the provision of Temporary Heat. The Commissioner's determination with respect to building enclosure shall 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 shall 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 shall 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 10 mil. Plastic 2) minimum 12 ounce waterproof canvas tarpaulins, or 3) a minimum three-eighths (3/8) inch thickness exterior grade plywood.
- d. Temporary covers for openings shall be the responsibility of the Contractor and such work shall 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 shall be the GREATER of the following: 1) 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, shall be the GREATER of the following: 68 degrees Fahrenheit or the temperature requirement for the particular type of work set forth in the Contract Documents.

D. DURATION:

- 1. The Contractor shall be required to provide Temporary Heat 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. The Contractor shall 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 shall 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 consecutive calendar days 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 consecutive calendar days (ccds). At a minimum, a full heating season shall extend from October 15<sup>th</sup> to April 15<sup>th</sup>.

Contract Duration	Full Heating Seasons Required
up to 360 ccds	1 full heating season
360 to 720 ccds	2 full heating seasons
more than 720 ccds	3 full heating seasons

E. METHOD OF TEMPORARY HEAT:

- 1. The method of temporary heat shall be in conformance with the New York City Fire Code and with all applicable laws, rules and regulations. Prior to implementation, such method shall be subject to the written approval of the Commissioner.
- 2. The method of temporary heat shall:
  - a. Not cause the deposition of dirt or smudges upon any finished work or cause any defacement or discoloration to the finished work.
  - b. Not be injurious or harmful to people or materials.



- c. Portable fueled heating devices or equipment SHALL 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 shall 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 shall 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, shall coordinate its operations in order to insure sufficient and timely performance of all required work, including work performed by trade subcontractors. The Contractor shall 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 shall 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 shall provide proper ventilating and drying, open and close the windows and other openings when necessary for the proper execution of the work and also when directed by DDC. The Contractor shall 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 shall provide all labor and materials to promptly furnish and set all required equipment and 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 shall 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, shall be made by the Contractor at his/her expense. The starting date for the warranty or guarantee period for such equipment shall 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 shall 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 shall be placed so as to comply with the requirements specified hereinbefore, and shall 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, shall 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 shall 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 shall



include such allowance amount in its Total Contract Price. The Contractor shall 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 shall 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 shall be responsible for the provision of Temporary Heat, as directed by the Commissioner. The City shall pay such Contractor for all costs for labor, material, and equipment necessary and required for the same. Payment shall be made in accordance with Article 26 of the Contract, except that the cost of fuel shall 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 written acceptance by the Commissioner of the work, and that the need for such maintenance is not the fault of the Contractor, the Contractor shall provide the required maintenance of the permanent heating system for the period of time directed by the Commissioner. The City shall 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 shall be made in accordance with Article 26 of the Contract, except that the cost of fuel shall 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 shall be limited to the direct cost of such fuel. The Contractor shall 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 shall be responsible for providing the items set forth below and shall include all expenses in connection with such items in its Total Contract Price. The Contractor shall provide such items promptly when required and shall 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 shall 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 his Contract.
  - b. The Contractor shall 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 shall 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 other than normal working hours for the period of time required by seasonal weather conditions.



**J. RELATED PLUMBING WORK:**

1. The Contractor shall 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 shall include all expenses in connection with such items of work in its Total Contract Price. The Contractor shall provide such items of work promptly when required and shall 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 shall be responsible to provide such plumbing equipment to the City in near perfect condition and shall make any repairs required, other than for ordinary wear and tear on the equipment, at his expense. The starting date for warranty and/or guarantee period for such plumbing equipment shall be the date of Substantial Completion acceptance by the City.
3. For Projects requiring the installation of new and/or modified gas service, as well as associated meter installations, the Contractor shall 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 shall 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 shall be maintained at all times in proper working order.
4. Dispose of rainwater in a lawful manner that will not result in flooding 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 shall establish a temporary field office for its own use at the site during the period of construction, at which readily accessible copies of all Contract Documents shall be kept.
- B. The field office shall 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:** In charge of the office there shall be a responsible and competent representative of the Contractor, duly authorized to receive orders and directions and to put them into effect.
- D. Arrangements shall be made by the Contractor whereby its representative may be readily accessible by telephone.
- E. All temporary structures shall be of substantial construction and neat appearance, and shall be painted a uniform gray unless otherwise directed by the Commissioner.
- F. **CONTRACTOR'S SIGN** - The Contractor shall post and keep posted, on the outside of its field office, office or exterior fence or wall at site of work, a legible sign giving 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 event of an emergency at any time.



- G. ADVERTISING PRIVILEGES - The City reserves the right to all advertising privileges. The Contractor shall 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 shall provide and install a lockset for the door to secure the equipment in the room. The Contractor shall provide two (2) keys to the Resident Engineer. After completion of the project the Contractor shall 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 shall 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 1/2"D x 18"W.
  - b. One (1) 9000 B.T.U air conditioner or as directed by Commissioner. Wiring for the air conditioner shall 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 shall provide one (1) telephone, where directed and shall 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, shall remain the property of the Contractor.
5. Computer Workstation quantities shall 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 shall, 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 shall be located at the Project site and shall be solely dedicated to the Project. Provision of the DDC Field Office shall commence within THIRTY (30) days from Notice to proceed and shall continue through forty-five (45) days after Substantial Completion of the required construction at the Project site. The Contractor shall 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 shall provide at its own cost and expense a mobile office trailer for use as the DDC Field Office. The Contractor shall install and connect all utility services to the



trailer within thirty (30) days from Notice to Proceed. The trailer shall have equipment in compliance with the minimum requirements hereinafter specified. Any permits and fees required for the installation and use of said trailer shall be borne by the Contractor. The trailer including furniture and equipment therein, except computer equipment specified in Sub-Section 3.8D.3 herein, shall remain the property of the Contractor.

- 3. Trailer shall be an office type trailer of the size specified herein, with exterior stairs at entrance. Trailer construction shall 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, 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 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 shall 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 FEILD OFFICE	2-1/2"

NOTE: In lieu of painting letters on 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 shall have aluminum insect screens. Provide wire mesh protective guards at all windows.
- 6. The interior shall 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 60 inches long by 36 inches wide with cabinet below and wall type plan rack at least 42 inches wide.
8. The washroom shall 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 shall 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 shall be furnished.
9. HVAC: The trailer shall be equipped with central heating and cooling adequate to maintain a temperature of 72 degrees during the heating season and 75 degrees during the cooling season when the outside temperature is 5 degrees F. winter and 89 degrees F. summer.
10. Lighting shall be provided via ceiling mounted fluorescent lighting fixtures to a minimum level of 50 foot candles in the open and private office(s) along with sufficient lighting in the washroom. Broken and burned out lamps shall be replaced by the Contractor. A minimum of four (4) duplex convenience outlets shall be provided in the open office and two (2) each in the private office(s). These outlets shall be in addition to special outlet requirements for computer stations, copiers, HVAC unit, etc.
11. Electrical service switch and panel shall 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 shall conform to the New York City Electrical Code.
12. The following movable equipment shall 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 shall 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 shall 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 shall be removed by the Contractor and shall be plugged at the mains. All piping shall become the property of the Contractor for Plumbing Work and shall be removed from the site, all as directed. All repair work due to these removals shall be the responsibility of the Contractor.
  - b. ELECTRICAL WORK:
    - 1) The Contractor shall 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 shall 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 shall 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., shall be removed and disposed of as directed.
- 6) All repair work due to these removals shall be the responsibility of the Contractor.

c. MAINTENANCE

- 1) The Contractor shall 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 shall be responsible for providing (a) all office supplies, including without limitation, pens, pencils, stationery, filtered drinking water and sanitary supplies, and (b) 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 shall remain solely and completely with the Contractor. The Contractor shall be responsible for the cost of any insurance coverage determined by the Contractor to be necessary for the Field Office.
- 4) At forty-five (45) days after the date of Substantial Completion, or sooner as directed by the Commissioner, the Contractors shall have all services disconnected and capped to the satisfaction of the Commissioner. All repair work due to these removals shall be the responsibility of the Contractor.

d. TELEPHONE SERVICE: The Contractor shall 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 shall include voice mail.
- 4) A remote bell located on outside of trailer
- 5) The telephone service shall continue until the trailer is removed from the site.

e. PERMITS: The Contractor shall 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 shall 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, shall 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. The Contractor shall provide a high volume copy machine (50 copies per minute) for paper sizes 8½ x 11, 8½ x 14 & 11 x 17. Copier shall remain at job site until the DDC Field office trailer is removed from the site.

2. The Contractor shall 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 shall be new, sealed in manufacturer's original packaging and shall have manufacturers' warranties. All items shall remain the property of the City of New York at the completion of the project.
3. **COMPUTER WORKSTATION:** The Contractor shall provide one complete computer workstation, in quantities specified in Sub-Section 3.8.B.4, as specified herein:
  - a. **Hardware/Software Specification:**
    - 1) Computer Equipment - Computers shall be provided for all contracts that have a Total Consecutive Calendar Days for construction duration as set forth in Schedule "A" of 180 CCD's or greater. Contracts of lesser duration shall not require computers.
    - 2) Computers furnished by the Contractor for use by City Personnel, for the duration of the contract, shall be in accordance with Specific Requirements, contained herein, shall remain the property of the City of New York at the completion of the project and shall meet the following minimum requirements:
    - 3) **Personal Computer(s) – Each Workstation Configuration.**
      - a) **Make and Model:** Dell; HP; Gateway; Acer; or, an approved equivalent. (Note: an approved equivalent requires written approval of the Assistant Commissioner of ITS.)
      - b) **Processor:** i5-2400 (6MB Cache, 3.1GHz) or faster computer - Single Processor.
      - c) **System RAM:** Minimum of 4GB (Gigabytes) Dual Channel DDR3 SDRAM at 1333MHz – 2 DIMMSs
      - d) **Hard Disk Drive(s):** 500 GB (Gigabytes) Serial ATA (7200RPM) w/DataBurst Cache, or larger.
      - e) **CD-RW:** Internal CD-RW, 48x Speed or faster.
      - f) **16xDVD+/-RW** DVD Burner (with double layer write capability) 16x Speed or faster
      - g) **I/O Ports:** Must have at least one (1) Serial Port, one (1) Parallel Port, and three (3) USB Ports.
      - h) **Video Display Card:** HD Graphics (VGA, HDMI) with a minimum of 64 MB of RAM.
      - i) **Monitor:** 22" W, 23.0 Inch VIS, Widescreen, VGA/DVI LCD Monitor.
      - j) **Available Exp. Slots:** System as configured above shall have at least two (2) full size PCI Slots available.
      - k) **Network Interface:** Integrated 10/100/1000 Ethernet card.
      - l) **Other Peripherals:** Optical scroll Mouse, 101 Key Keyboard, Mouse Pad and all necessary cables.
      - m) **Software Requirement:** Microsoft Windows 7 Professional SP1, 32 bit; Microsoft Office Professional 2010 or 2013; Microsoft Project 2010; Adobe Acrobat reader; Anti-Virus software package with 2 year updates subscription; and, either Auto Cad LT or Microsoft



Visio Standard Edition, as directed by the Resident Engineer.

- 4) DDC Field Office Specs: DDC Field Offices requiring computers shall be provided with the following:
  - a) One (1) broad-band internet service account. Wideband Internet connectivity at a minimum throughput of 15 Mbps download and 5 Mbps upload is required at each field office location with 1-5 staffers. For larger field offices see table below for minimum required upload 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 #	Upload Speeds (Minimum)
1 – 5	5 Mbps
6 – 10	10 Mbps
11 – 15	15 Mbps
16 – 20 ...	20 Mbps

This account will be active for the life of the project. The e-mail name for the account shall be the DDC Field Office/project Id (e.g. FLD K HWK666 McGuinness@earthlink.com).

- b) One (1) 600 DPI HP Laser Jet Printer (twelve (12) pages per minute or faster) with one (1) Extra Paper (Legal Size)
  - c) All necessary cabling for equipment specified herein.
  - d) Storage Boxes for Blank CD's
  - e) Printer Table
  - f) UPS/Surge Suppressor combo
- 5) All computers required for use in the Engineer's Field Office shall be delivered, installed, and setup in the Field Office by the Contractor.
- 6) All Computer Hardware shall 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 shall be provided by the Contractor, and shall 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 Information Technology Services at 718-391-1761.
- 10) Ownership: The equipment specified above shall, unless otherwise directed by the Commissioner, be the sole property of the City of New York upon delivery to the DDC Field Office. The Contractor shall prepare and maintain an accurate inventory of all equipment which it purchases for the DDC Field Office. Such inventory shall be provided to the City of New York. Upon completion of the



required services, as directed by the Commissioner, the Contractor shall turn such equipment over to the City of New York.

**E. HEAD PROTECTION (HARD HATS):**

1. The Contractor shall provide a minimum of 10 standard protective helmets for the exclusive use of Department of Design and Construction personnel and their visitors. Helmets shall be turned over to the Resident Engineer and kept in the DDC Field Office.
2. Upon completion of the project, the helmets shall become the property of the Contractor.

**3.9 MATERIAL SHEDS:**

- A. Material sheds used by the Contractor for the storage of its materials shall 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. Store combustible materials apart from the facility.

**3.10 TEMPORARY ENCLOSURES:**

- A. 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, insulate temporary enclosures.

**3.11 TEMPORARY PARTITIONS:**

- A. Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate occupied tenant areas from fumes and noise.
  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 2 layers of 3-mil (0.07-mm) polyethylene sheet, extending sheets 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 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. Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
- B. Prohibit smoking in all areas.
- C. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.



- D. 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. 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 shall furnish, erect and maintain a wood construction or chain-link fence to the extent shown on the drawings or required by the work enclosing the entire project on all sides. All materials used shall be new. Any permit required for the installation and use of said fence and costs shall be borne by the Contractor.
- B. WOOD FENCE shall be 7'-0" 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 shall be secured minimum 1/2 inch thick exterior grade plywood. Posts shall be firmly fixed in the ground at least 30" and thoroughly braced. Top edge of fence shall be trimmed with a rabbeted edge mould. Provide on the street traffic sides of fence, observation openings as directed.
  - 1. GATES - Provide an adequate number of double gates, complete with hardware, located as approved by the Resident Engineer. Double gates shall have a total clear opening of 14'-0" with two (2) 7'-0" hinged swinging sections. Hanging posts shall be 6" x 6" and shall extend high enough to receive and be provided with tension or sag rods for the swinging sections.
  - 2. PAINTING - The fence and gates shall 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" shall be painted on fence with three (3) inch high letters on 25 foot spacing for the entire length of fence on street traffic sides. Signs shall be stenciled five (5) feet above the sidewalk.
- C. CHAIN-LINK FENCING shall be minimum 2-inch thick, galvanized steel, chain-link fabric fencing; 8 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Fence shall be accurately aligned and plumb, adequately braced and complete with gates, locks and hardware as required. Under no condition shall fencing be attached or anchored to existing construction or trees.
- D.
  - 1. It shall 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 shall 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 shall be provided for protection of sidewalks and curbs.
  - 4. Where required, make provision for fire hydrants, lampposts, etc.
  - 5. REMOVAL - When directed by the Resident Engineer, the fence shall be removed.

**3.14 RODENT AND INSECT CONTROL:**

- A. DESCRIPTION: The Contractor shall 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 premises requiring such special attention.
- B. MATERIALS:
- 1 All materials shall be approved by the New York State Department of Environmental Conservation 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 shall 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 shall 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 shall 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 shall be placed during the period of construction and any consumed or decomposed bait shall be replenished as directed.
  - 3 At least one 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, shall be placed at locations that are inaccessible to pets, human beings, children and other non-target species, particularly wildlife (for example-birds) in the project area.
  - 4 The Contractor shall be responsible for collecting and disposing of all trapped and poisoned rodents found in live traps and tamper proof bait stations. The Contractor shall also be responsible for posting and maintaining signs announcing the baiting of each particular location.  
The Contractor shall be responsible for the immediate collection and disposal of any visible rodent remains found on streets or sidewalks within the project area.
  - 5 It is anticipated that public complaints will be addressed to the Commissioner. The Contractor, where directed by the Commissioner, shall 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.
  - 6 Emergency service during the regular workday hours (Monday through Friday) shall be rendered within 24 hours, if requested by the Commissioner, at no additional cost to the City.



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**F. EDUCATION & NOTICES:**

- 1 The Contractor shall post notices on all Construction Bulletin Boards advising workers, employees, and residents to call the Engineer's Field Office to report any infestation or outbreak of rodents, rats, mice, water beetles, roaches and fleas within the project area. The Contractor shall provide and distribute literature pertaining to 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 shall 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 shall keep a record of all rodent and waterbug infestation surveys conducted by him/her and make available, upon request, to the Commissioner. The findings of each survey shall include, but not be limited to, recommended Integrated Pest Management (IPM) techniques, like baiting, trapping, proofing, etc., proposed for rodent and waterbug pest control.
2. The Contractor shall 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, shall 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 New York State Department of Agriculture and Markets (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 sub-contractor performing tree work has entered into a compliance agreement with NYSDAM. The terms of said compliance agreement shall be strictly complied with. Any host material so removed shall be delivered to a facility approved by NYSDAM. For the purpose of this contract host material shall be ALL species of trees.
2. Any host material that is infested with the Asian Longhorned Beetle 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 shall submit to the Commissioner a copy of a valid Asian Longhorned Beetle compliance agreement entered into with NYSDAM and the Contractor or its sub-contractor performing tree work. If any host material is transported from the quarantine area the Contractor shall 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 shall be defined as all five boroughs of the City of New York. In addition, prior to the start of any tree work, the Contractor shall contact the

NYC Department of Parks & Recreation's 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 shall retain a Certified Arborist, as defined by New York City Department of Parks and Recreation (NYCDPR) regulations, to provide the services described below.
1. Surveys and Reports: The Certified Arborist shall, 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; (3) evaluation of the general health and condition of any infected plant material.
  2. Frequency of Reports: The Certified Arborist shall 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 24 months in duration, the Certified Arborist shall conduct a survey and prepare a report at the midpoint of construction. Copies of each plant material assessment report shall 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 shall 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 50 (fifty) feet of the project's Contract Limit Lines (CLLs) or Property Lines (PLs).
    - b. Any part of the tree or shrub stands within 50 (fifty) 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 50-foot inclusionary perimeter as outlined above.
  4. Tree Protection Plan: The Certified Arborist shall prepare, and the Contractor shall 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 NYCDPR jurisdiction as determined by the Department of Transportation, and (4) all trees that are located in proximity to the project site, as defined above. The Tree Protection Plan shall comply with the NYC 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 shall be submitted to the Resident Engineer prior to the commencement of construction. Implementation of the Tree Protection Plan for street trees and trees under NYCDPR jurisdiction shall 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



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of the project site, or (2) a tree that stands in a sidewalk and is located within 50 feet of the intersection of the project's site's property line with the street frontage property line.

- C. No Separate Payment. No separate payment shall 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 shall be deemed included in the Contractor's bid for the Project.

### 3.16 PROJECT IDENTIFICATION SIGNAGE:

- A. The Contractor shall 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 shall furnish and install a sign at the entrance (gates) as follows:

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**NO TRESPASSING**

**AUTHORIZED PERSONNEL ONLY**

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- C. If no construction fence exists at the site, this notice shall 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 shall produce and install one (1) project sign which shall be posted and maintained upon the site of the project at a place and in a position directed by the Commissioner. The Contractor shall protect the sign from damage during the continuance of work under the Contract and shall 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 shall 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 shall provide all materials required for the production of the sign as specified herein. Workmanship shall be of the best quality, free from defects and shall be produced in a timely manner.
- 3 Schedule: Upon project mobilization, the Contractor shall commence production and installation of the sign.
- 4 Removal: At the completion of all work under the Contract, the Contractor shall remove and dispose of the project sign away from the site.
- 5 Sign construction:
  - a. Frame: The frame shall be from quality dressed 2"x2" pine, fire retardant, pressure treated lumber, that surrounds the inside back edge of the sign. The sign shall have one (1) intermediate vertical and two (2) diagonal supports, glued and screwed for rigidity. Frame shall be painted white with two (2) coats of exterior enamel paint, prior to mounting of sign panel.
  - b. Edging: U-shaped, 22 gauge aluminum edging, with a white enameled finish to match sign



background, shall run around entire edging of sign panel and frame. Corners shall be mitered for a tight fit. Channel dimensions shall 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 shall be constructed in one (1) piece of 14 gauge (.0785") 6061-T6 aluminum. This panel shall be pre-finished both sides with a glossy white baked-on enamel finish and be flush with edge of 2" x 2" wood frame. Samples must be submitted for approval.
- d. Fastening: Fasten sign panel to wood frame using cadmium plated no. 8 sheet metal screws at 1/2" below edge of panel and 8" on center. The U-shaped aluminum channel shall 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 shall insert the project name and names and titles of personnel (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 shall 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 shall be guaranteed for nine (9) years. Guarantee must cover fading, peeling, chipping or cracking. The sign manufacturer is required to maintain all specified Pantone Matching System (PMS) type and other composition elements represented in the digital file of the project sign.

**REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.17 B**

B. PROJECT RENDERING:

1. Responsibility: In addition to the Project Sign, the Contractor shall 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 shall 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 shall 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 shall provide 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



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materials or construction set-up. The Contractor shall 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 shall be no less than one (1) Security Guard on duty every day, including Saturdays, Sunday and Holidays, 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 shall not apply after the finishing painting of the plaster work is commenced; thereafter, not less than one (1) Security Guard shall be on duty continuously, 24 hours a day.

2. Every Security Guard shall be required to hold a "Certificate of Fitness" issued by the Fire Department. Every Security Guard shall, 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 shall be replaced by the Contractor upon the written demand of the Commissioner.
  4. Each Security Guard furnished by the Contractor shall 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 shall 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 shall 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 shall 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 shall 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, shall 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, shall be replaced by the Contractor at no additional cost to the City.

END OF SECTION 01 50 00



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**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 15 Stories
    - b. For New buildings over 15 Stories
    - c. For Existing Buildings
  2. Temporary Construction Hoists and Hoist ways (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 15 STORIES:**

- A. **INSTALLATION:** The Contractor shall 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, and representatives of the DDC and other Governmental Agencies having jurisdiction of work at the project. The Contractor shall 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 shall 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 shall 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 shall 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, 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 shall include all costs in connection with the temporary elevator, including without limitation, the costs specified herein.
- D. **COMMENCEMENT OF SERVICE:** The Contractor shall begin to provide temporary elevator service using the selected main passenger elevator no later than eight (8) weeks (40 working 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 (15 working days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed the following work shall have been completed:
1. The shaft shall have been completely enclosed by either the permanent or a temporary enclosure meeting the requirements of the law.
  2. The machine room shall have been made completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary shall be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.
  3. There shall have been installed on all floors at the shaft way entrances to the elevator, solid substantial frames and either sliding or swing doors with substantial hardware and door locks and any necessary approved wire mesh barricades for adjacent shaft ways.
  4. There shall have been furnished and installed solid substantial enclosures at front, back, sides and top of car platform enclosure, with emergency exit at top of car, excepting that the portion of the front at the elevator entrance shall have been provided with a substantial temporary door or gate.
- E. **ELECTRICAL INSTALLATION:** The Contractor, not later than 20 calendar days after the machine room roof slab or that portion of its surrounding the elevator has been placed, shall have furnished and installed temporary or permanent power and light feeders as required for the elevator used for temporary service and shall have connected 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 shaft way and for the car control and signal traveling cables. The Contractor shall make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.
- F. **REMOVAL:** When elevators for permanent use have been installed and are in condition for service, and when directed by the Commissioner, the Contractor shall 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 shall 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 shall furnish and install new governor and compensating ropes, new traveling cables and new controller parts, etc. The car and counterweight safeties shall 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 shall be installed and payment therefore will be made in accordance with Article 26 of the Contract.



- H. **REPLACEMENT:** The Contractor shall 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, excepting the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheave spaces used for temporary operation of elevators shall be thoroughly cleaned. Where lubricated rails are used they shall 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., shall be borne by the Contractor except for the replacement of hoisting ropes.
- I. **LIMITATIONS ON USE:** The temporary elevator shall not be used during its operation for the hoisting of materials or the removal of rubbish, but shall be limited only to the transportation of employees of the Contractor and/or its subcontractors, and 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 shall notify the Resident Engineer within 24 hours after such damage has occurred. As indicated above, the Contractor shall 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 \$100 per day for each day it fails to provide the temporary elevator service described in this section beginning with the 41<sup>st</sup> working 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 15 STORIES:**

- A. **INSTALLATION:** The Contractor shall 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, and representatives of the DDC and other Governmental Agencies having jurisdiction of work at the project. The Contractor shall 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 shall 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 shall not be operated simultaneously.
- B. **RESPONSIBILITY:** The Contractor shall 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 shall 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 shall

include all costs in connection with the temporary elevators, including without limitation, the costs specified herein.

- D. **LOW RISE ELEVATOR:** The Contractor shall begin to provide temporary elevator service using one (1) selected main passenger elevator no later than six (6) weeks (30 working days) after the 12th Floor slab, or that portion of it surrounding the elevator shaft, has been placed and stripped. No later than one (1) week, five (5) working days, after the 12th Floor slab, or that portion of it surrounding the elevator shaft, has been placed and stripped the following work shall have been completed:
1. The shaft shall have been completely enclosed up to the 12th Floor by either the permanent or a temporary enclosure meeting the requirements of the law.
  2. A temporary machine room enclosure shall have been provided at the 11th Floor and shall have been made completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary, shall be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.
  3. There shall have been installed on all floors up to and including the 9th Floor at the shaft entrances to the elevator, solid substantial wood frames and either sliding or swing doors with substantial hardware and door locks, also any necessary approved wire mesh barricades for adjacent shaft ways.
  4. There shall have been furnished and installed solid substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at top of car, excepting that the portion of the front at the elevator entrance shall have been provided with a substantial temporary door or gate.
- E. **ELECTRICAL INSTALLATION:** The Contractor not later than 10 calendar days after the 12th Floor slab or that portion of it surrounding the elevator, has been poured and stripped, shall have furnished and installed temporary or permanent power and light feeders as required for the elevator used for temporary service and shall have connected such feeders to the terminals on the starter panels or controllers in the temporary machine room, to the low voltage transformers and car light outlets in the center of the shaftway and for the car control and signal traveling cables. The Contractor shall 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 shall begin to provide temporary elevator service to all floors, using a selected main passenger elevator, no later than eight (8) weeks (40 working 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 (15 working days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed, the following work shall have been completed:
1. The shaft shall have been completely enclosed by either the permanent or temporary enclosure, meeting the requirements of the law.
  2. The machine room shall have been made completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary shall be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.
  3. There shall have been installed on all floors at the shaft way entrances to the elevator, solid substantial frames and either sliding or swing doors with substantial hardware and door locks, also any necessary approved wire mesh barricades for adjacent shaft ways.
  4. There shall have been furnished and installed, solid substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at top of car, excepting that the portion of the front at the elevator entrance shall have been provided with a substantial temporary door or gate.
- G. **ELECTRICAL INSTALLATION:** The Contractor, not later than 20 calendar days after the machine room slab or that portion of it surrounding the elevator shaft has been placed, shall have furnished and installed temporary or permanent power and light feeders as required for the high rise elevator to be used for



- temporary service and shall have connected 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 shall 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 shall be shut down.
  - I. **REMOVAL:** When one (1) or more elevators for permanent use have been installed and are in condition for service, and when directed by the Commissioner, the Contractor shall remove the temporary enclosures and 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 shall 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 shall furnish and install new governor and compensating ropes, new traveling cables, new controller parts, etc. The car and counterweight safeties shall 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 shall be installed and payment therefore will be made in accordance with Article 26 of the Contract.
  - K. **REPLACEMENT:** The Contractor shall 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, excepting the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheaves spaces used for temporary operation of elevators shall be thoroughly cleaned down. Where lubricated rails are used they shall 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., shall be borne by the Contractor except for the replacement of hoisting ropes.
  - L. **LIMITATIONS ON USE:** The temporary elevators shall not be used during their operation for the hoisting of materials or the removal of rubbish, but shall be limited only to the transportation of employees of the Contractor and/or its subcontractors, and 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 shall notify the Resident Engineer within 24 hours after such damage has occurred. As indicated above, the Contractor shall 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 \$100 per day for each day it fails to provide the temporary elevator service described in this Section beginning with the 31st working day after the 12th Floor slab, or that portion of the 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, and 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 shall 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 shall 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 shall 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, excepting the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheave spaces used for temporary operation of elevators shall be thoroughly cleaned down. Where lubricated rails are used they shall 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., shall 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 shall be installed and payment therefore will be made in accordance with Article 26 of the Contract.
- D. **LIMITATIONS ON USE:** The temporary elevator shall not be used during its operation for the hoisting of materials or the removal of rubbish, but shall be limited only to the transportation of employees of the Contractor and/or its subcontractors, and 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 shall notify the Resident Engineer within 24 hours after such damage has occurred. As indicated above, the Contractor shall 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 \$100 per day for each day it fails to provide elevator services described in this section beginning with 15 consecutive calendar days from Notice to Proceed. 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 shall 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 shall be constructed at such locations as will 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 shall 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 hoist ways, providing such use complies with the requirements of the Building Code of the City of New York and has been approved by the Commissioner, and providing further it entails no interference with the progress of the work.
- D. **PROTECTION FOR INTERIOR HOISTS:** All interior material hoist ways shall be enclosed on each floor and shall be adequately protected with appropriate safety guards. In no event shall the protection be less than that required by law.

**END OF SECTION 01 54 11**



**SECTION 01 54 23**  
**TEMPORARY SCAFFOLDING AND PLATFORMS**

**PART I – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].
- B. Section 01 35 26: Safety Requirements Procedures.
- C. The Contractor 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 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 sites 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 shall comply with requirements of Chapter 33 (Safeguards During Construction or Demolition) of the 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 shall designate and employ a Jobsite Safety Coordinator, who shall be a competent person, who shall 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 supported scaffold certificate of completion. An alternate shall also be designated, in the event that the Jobsite Safety Coordinator is absent. The Jobsite Safety Coordinator shall:
  - 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.
  12. Keep a log of significant actions and events connected with the scaffolding.
- B. The Contractor shall be responsible for erecting, maintaining and dismantling the scaffolding and/or sidewalk shed in conformance with requirements of the New York City Building Code, OSHA and the Contract documents, including the specifications. The Contractor shall also be guided by generally accepted standards of scaffold industry practice as promulgated by the Scaffold Industry Association.
- C. The Contractor shall 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 shall be responsible to ensure the following: (1) that the installation design is in compliance with requirements of the New York City 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 New York City Department of Buildings approved training provider are mandatory. These users have the duty to become familiar with the New York City 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 shall prepare, obtain and submit the following to the Resident Engineer:

- A. NYC Department of Buildings 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;
  16. All sidewalk sheds shall 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 shall be issued for each inspection and pull-test below, and shall be logged and maintained on site by the Jobsite Safety Coordinator for the duration of the project.
- B. Pull testing shall be required during design, and during or post erection, where anchorage is made into masonry. The Scaffold Engineer shall specify the test method, proof load and the number of trials.
- C. Sidewalk sheds shall be inspected after initial installation, major modification, or damage and thence every three months. Inspections shall be by a Scaffold Engineer for custom sheds and by a Competent Person employed by the Contractor for standard sheds.
- D. Scaffolds shall be inspected by the Scaffold Engineer during erection, post-erection and prior to use and thence every three months. The Scaffold Engineer shall repeat inspections after major alteration/modification, damage.
- E. A Qualified Person assigned by the Contractor shall 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 shall 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 shall 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 be available on-site at all times.
- 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 shall 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 shall 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**





NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

Division 01 – DDC STANDARD GENERAL CONDITION  
SINGLE CONTRACT PROJECTS

Issue Date - June 01, 2013

Revised - January 15, 2015

No Text

TEMPORARY SCAFFOLDING AND PLATFORMS

01 54 23 - 4



NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

Division 01 – DDC STANDARD GENERAL CONDITION  
SINGLE CONTRACT PROJECTS  
Issue Date - June 01, 2013  
Revised - January 15, 2015

## 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

#### 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.
- B. Design Consultant: "Design Consultant" shall 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.

#### 1.5 QUALITY ASSURANCE:

- A. Land Surveyor Qualifications: A professional land surveyor who is licensed in the State of New York and who is experienced in providing land-surveying services of the kind indicated.

#### PART II – PRODUCTS (Not Used)

#### PART III – EXECUTION

##### 3.1 DELIVERY OF MATERIALS:

- A. Material Orders: The Contractor shall furnish to the Commissioner a copy of each material order, indicating date of order and quantity of material, and shall also notify the Commissioner when materials have been delivered to the site and in what quantities.
- B. Ample Quantities: The Contractor shall deliver materials in ample quantities to insure 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 shall be delivered with unbroken seals and shall bear proper labels.
- D. Deliveries: The Contractor shall coordinate deliveries in order to avoid delaying or impeding the progress of the work.
- E. Handling: The Contractor shall 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, and periodically inspect to assure that stored products are undamaged and are maintained under required conditions.
- G. Stacking: All materials shall be properly stacked in convenient places adjacent to the site, or where directed, and protected in a satisfactory manner. Stacked materials shall be so arranged as to not interfere with visibility of traffic control devices.
- H. Overloading: If authority is given to store materials in any part of the project area, they shall 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 shall 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 shall devote its time and personal attention to the work and shall employ and retain at the project site, from the commencement until the entire completion of the work, a Contractor's Construction Superintendent. The Contractor's Construction Superintendent shall be registered with the New York City Department of Buildings in compliance with the Construction Superintendent Rule of the City of New York and shall be competent and capable of maintaining proper supervision and care of the work and shall be acceptable to the Commissioner. The Construction Superintendent shall, in the absence of the Contractor, and irrespective of any superintendent or foreman employed by any subcontractor, shall see that the instructions of the Commissioner are carried out.
- B. Replacement: The Contractor's Construction Superintendent on the job shall 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 of the Contractor in connection with the performance of the work.
- B. Responsibility: The Contractor shall establish all other lines and elevations required for its work and shall be solely responsible for the accuracy thereof.
- C. Safeguard All Points: The Contractor shall safeguard all points, stakes, grade marks and bench marks made or established by the Contractor on the work, shall re-establish same if disturbed and bear the entire expense of rectifying the work improperly installed due to not maintaining, not protecting or removing without authorization such established points, stakes, or marks.
- D. City Monuments and Markers: No work shall be performed near City monuments or marks so as to disturb them until the said monuments or marks have been referenced or reset or otherwise disposed of by the relevant Agency or party who installed them.
- E. Foundations: The Contractor shall 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 shall 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 shall establish the permanent lines of exterior walls. The Contractor shall furnish promptly, 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 shall 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, shall be a land Surveyor licensed in the State of New York and shall be subject to the approval of the Commissioner. The Surveyor shall not be a regular employee of the Contractor, nor shall the Surveyor have any interest in the Contract. The Surveyor shall not be employed by the Contractor in laying out any work, it being intended that the Surveyor's certification shall represent an independent and disinterested verification of such layout. The Surveyor shall report to the Department of Design and Construction's 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 shall 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 drawings shall be noted on the final certificate and there shall be included 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 shall submit to DDC for submission to the Department of Buildings a final Survey by the licensed Surveyor showing the location of the new Structure, before completion of the Structure. This Survey shall 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 Structures on the plan, together with the location and boundaries of the lot or plot upon which the Structure 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 shall 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 forces of the Department of Design and Construction 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, if any were referred to, were actually taken from the site at the times, places and in the manner indicated. The samples are available for inspection in the Department of Design and Construction Subsurface Exploration Section.
  - 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 and 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 work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
  - 1. Before construction, 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, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with the subcontractor responsible for installation or application present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 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.
  - 4. 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 the NYC 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 the NYC Department of Buildings (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 shall comply with all federal, state and local asbestos regulations affecting the work for this Contract.
- B. Contractor Responsibility: The Contractor shall comply with all federal, state and local environmental regulations, including without limitation USEPA and OSHA regulations which require the Contractor to assess if lead based paint will be disturbed during the work in order to protect his/her workers and the building occupants from migration of lead dust into the air. The Contractor shall comply with all federal, state and local environmental waste disposal regulation 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 shall verify all dimensions and conditions on the job so that all work will properly join the existing work.
- B. The Contractor, before commencing work, shall examine all adjoining work 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 shall report to the Commissioner any condition that will prevent it from performing work that conforms to the required standard.

- C. Existing Utility Information: 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. Coordinate with authorities having jurisdiction.
- D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

### 3.8 DEFERRED CONSTRUCTION:

- A. Where necessity for deferred construction is certified by the Commissioner, in order to permit the installation of any item or items of equipment required to be furnished and installed concurrent with the time allowed for doing and completing the work of the Contract, the Contractor shall defer construction work limited to adequate areas as approved by the Commissioner.
- B. The Contractor shall 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: 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.
- 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 shall 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 shall be responsible for all costs in connection with such regulatory compliance, unless otherwise specified in the Contract.

### 3.11 TRANSPORTATION:

- A. Availability: It shall be the duty of the Contractor to determine the availability of transportation facilities and dockage for the use of its employees, equipment and material 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 shall 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 shall 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 shall 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: In the event that timely delivery of sleeves and other materials cannot be made, and to avoid delay, 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 shall fill around them with materials as required by the Contract. The necessary expenditures incurred for the boxing out and filling in shall 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 shall submit to the 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 shall be stamped and returned if approved and/or comments will be transmitted. The Contractor shall 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 shall not predicate its layout work on unapproved sketches.

**3.14 CUTTING AND PATCHING:**

- A. Responsibility: The Contractor shall do all cutting, patching and restoration required by its work, unless otherwise particularly specified in the Specifications.
- B. Restore Work: The Contractor shall restore any work damaged during the performance of the work.
- C. Competent Workers: All restoration work shall 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 shall 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 Commissioner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- G. Existing Warranties: 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 shall 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, and as stated here, shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized. Comply with requirements of Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
- B. Rubbish: Rubbish shall not be thrown from the windows or other parts of the project. Mason's rubbish, dirt and other dust-producing material shall be wetted down periodically.
- C. Location: The Contractor shall clean Project site and work area daily and sweep up and deposit, at a location designated on each floor, all of its rubbish, debris and waste materials, as it accumulates and when directed by the Resident Engineer. Wood crating shall 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 7 days during normal weather or 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: The Contractor shall be responsible for the removal of all rubbish, etc., from the site. The Contractor shall remove from the designated locations all piles of rubbish, debris, waste material and wood crating as they accumulate and when directed by the Resident Engineer, and shall remove them from the site. The Contractor shall employ and keep engaged for this purpose an adequate number of laborers.
- E. Surplus Materials: The Contractor shall 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 shall 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 shall thoroughly clean all equipment and materials furnished and installed and shall 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 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 shall take over and maintain the Project site, after order to start work.
- B. The Contractor shall 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 shall, 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 shall 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 shall 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 shall take over and maintain all project areas, after order to start work.
- B. Until the date of Final Acceptance, the Contractor shall be responsible for the safety of all project areas, including water, gas, electric and other mains and pipes and conduits and shall 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 shall be kept clear at all times, maintained, and if damaged, repaired to serviceable conditions with materials to match existing.
- D. The Contractor shall 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, shall comply with the New York City Dept. of Buildings, Bureau of Electrical Control requirements.

**3.23 OBSTRUCTIONS IN DRAINAGE LINES:**

- A. The Contractor shall 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 shall be kept clear of any and all debris. Any stoppage shall be repaired immediately at the expense of the Contractor.

**END OF SECTION 01 73 00**



**SECTION 01 74 19**  
**CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**

**PART I – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY:**

- A. This section includes administrative and procedural requirements for the management and disposal of construction waste and includes the following requirements:
1. Waste Management Goals
  2. Waste Management Plan
  3. Progress Reports
  4. Progress Meetings
  5. Management Plan Implementation
- B. This Section includes:
1. Definitions
  2. Waste Management Performance Requirements
  3. Reference Resources
  4. Submittals
  5. Quality Assurance
  6. Waste Plan Implementation
  7. Additional Demolition and Salvage Requirements
  8. Disposal

**1.3 RELATED SECTIONS:** Include, without limitation the following:

- A. Section 01 10 00 SUMMARY
- B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
- C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
- D. Section 01 73 00 EXECUTION
- E. Section 01 77 00 CLOSEOUT PROCEDURES
- F. Section 01 78 39 CONSTRUCTION RECORD DOCUMENTS
- G. Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS 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.
- B. Design Consultant: "Design Consultant" shall 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. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk or the like.

- D. Construction and Demolition 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.
- E. Diversion from Landfill: To remove, or have removed, from the site for recycling, reuse or salvage, material that might otherwise be sent to a landfill.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product.
- G. 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.
- H. Return: To give back reusable items or unused products to vendors.
- I. Reuse: To reuse excess or discarded construction material in some manner on the Project site.
- J. Salvage: To remove a waste material from the Project site for resale or reuse.
- K. 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.
- L. 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.

#### 1.5 WASTE MANAGEMENT PERFORMANCE REQUIREMENTS:

- A. The City of New York has established that this project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, inaccurate planning, breakage, mishandling, contamination, or other factors shall be employed.
- B. Of the waste that is generated during demolition, as many of the waste materials as economically feasible, and as stated here, shall be reused, salvaged, or recycled. Waste disposal in landfills shall 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 LEED (Leadership in Energy and Environmental Design) 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. A minimum of 75% of total Project demolition waste (by weight) shall be diverted from landfill. 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
  11. Reuse items indicated on the Drawings and/or elsewhere in the Specification
- E. All fluorescent lamps, HID lamps and mercury-containing thermostats removed from the site shall be recycled.
- 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.

#### 1.6 REFERENCES, RESOURCES:

- A. DDC encourages its contractors to seek information from websites and experts in salvage or recycling in order to minimize disposal costs. There are numerous opportunities to sell, salvage, or to donate materials and accrue tax benefits (which would accrue to the contractor); also there are outlets that will pick up, and in some cases buy recyclable materials. Examples of information resources are as follows:
1. DDC's Sustainable Design web site:  
[http://www.nyc.gov/html/ddc/html/design/sustainable\\_home.shtml](http://www.nyc.gov/html/ddc/html/design/sustainable_home.shtml) This includes a manual on Construction and Demolition Waste Reduction and Recycling, a Sample Waste Management Plan and sample C&D Waste Management log. A standard Construction and Demolition Waste Management Log form is included at the end of this section.
  2. Web Resources  
(Information only; no warranty or endorsement is implied.)  
[www.wastematch.org](http://www.wastematch.org) Site of New York Waste Match, a materials exchange database and service  
[www.bignyc.org](http://www.bignyc.org) Site of Build It Green NYC, a non profit outlet for salvaged and surplus building materials  
[www.usgbc.org](http://www.usgbc.org) Site of the United States Green Building Council, with a description of the LEED certification process and requirements for C&D waste recycling  
[www.epa.gov/epawaste/index.htm](http://www.epa.gov/epawaste/index.htm) Site of the U.S. Environmental Protection Agency that discusses construction and demolition waste issues, and links to other resources.

#### 1.7 SUBMITTALS:

- A. The Contractor shall be responsible for the development and implementation of a Waste Management Plan for the Project. The Contractor's subcontractors shall assist in the development of that Plan, and collect and deposit their waste and recyclable materials in accordance with the approved Plan.
- B. DRAFT WASTE MANAGEMENT PLAN. Within fifteen (15) days after receipt of 'Notice to Proceed', or prior to any waste removal, whichever occurs sooner, the Contractor shall submit to the Commissioner a Draft Waste Management Plan. Include separate sections for demolition and construction waste. The Plan shall demonstrate how the performance goals will be met, and contain the following:



1. List of materials targeted for reuse, salvage, or recycling, and names, addresses, and phone numbers of receiving facilities/companies that will be purchasing or accepting each material.
  2. Description of onsite and/or offsite sorting methods for all materials to be removed from site.
  3. If mixed construction and demolition waste is to be sorted off-site, provide a letter from the processor stating the average percentage of mixed construction and demolition waste they recycle.
  4. Landfill information: Names of landfills where non-recyclable/reusable/salvageable waste will be disposed, and list of applicable tipping fees.
  5. Materials handling procedures: 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.
  6. Transportation: A description of the means of transportation and destination for recycled materials.
  7. Meetings: Description of regular meetings to be held to address waste management.
  8. Sample spreadsheet and description of how the implementation of the plan will be documented on a monthly basis.
- C. FINAL WASTE MANAGEMENT PLAN. Within fifteen (15) days of Commissioner's approval of the Draft Plan, the Contractor shall submit a Final Waste Management Plan.
- D. PROGRESS REPORTS. The Contractor shall submit monthly a 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 jobsite waste. A DDC C&D Waste Management Log form is available on the DDC Sustainable Design website and 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 Category
    - d. Total quantity of waste, in tones/cubic yards, by type
    - e. Quantity of waste salvaged, recycled and/or reused, by type
    - f. Total quantity of waste diverted from landfill (recycled, salvaged, reused) as a percentage of total waste
    - g. 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 measure 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 shall 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 shall save such original documents for the life of the project plus seven (7) years.
- E. LEED Submittal: For LEED designated projects submit LEED Letter Template for Credit 2.2, 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.
- F. Refrigerant Recovery. Submit Qualification data for Refrigerant recovery technician. Statement of refrigerant recovery, signed by the refrigerant recovery technician responsible for recovering refrigerant

stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

#### 1.8 QUALITY ASSURANCE:

- A. The Contractor shall designate a Waste Management Coordinator, to ensure compliance with this section. Coordinator shall be present at Project site full time 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 shall be discussed at the following meetings:
  - 1. Pre-demolition kick-off meeting
  - 2. Pre-construction kick-off meeting
  - 3. Regular job-site meetings
  - 4. Contractor toolbox meetings

#### PART II – PRODUCTS (Not Used)

#### PART III – EXECUTION

#### 3.1 WASTE PLAN IMPLEMENTATION:

- A. The Contractor shall implement the Waste Management Plan, coordinate the Plan with all affected trades, and designate one individual as the Construction Waste Management 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 shall 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 shall oversee and document the results of the Plan. Monies received for salvaged materials shall remain with the Contractor, except the monies for those items specifically identified elsewhere in the specifications, or indicated on the drawings as belonging to others.
- C. Responsibilities of Subcontractors: Each subcontractor shall be responsible for collecting its waste, non-returned surplus materials, and rubbish, in accordance with the Waste Management Plan.
- D. Distribution. The Contractor shall distribute copies of the Waste Management Plan to each Subcontractor, Resident Engineer, Construction Manager, and Commissioner.
- E. Instruction: The Contractor shall provide on-site instruction of proper waste management procedures to be used by all parties in appropriate stages of the Project.
- F. Procedures. Conduct waste management operations to ensure minimum interference with site vegetation, roads, streets, walks and other adjacent occupied and used facilities.
  - 1. Collect co-mingled 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.





NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

Division 01 – DDC STANDARD GENERAL CONDITION  
SINGLE CONTRACT PROJECTS  
Issue Date - June 01, 2013  
Revised - January 15, 2015

3. Comply with the General Conditions for controlling dust and dirt, environmental protection, and noise control.

### 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 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





NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

# CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT LOG

No Text

**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
  6. Repair of the Work
- 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, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED 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 shall be in accordance with ASHRAE and USGBC LEED- NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS. The Contractor shall 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 & 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.
- B. Design Consultant: "Design Consultant" shall 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. Substantial Completion: shall mean the written determination by the Commissioner that the Work required under the Contract is substantially, but not entirely, complete.
- D. Final Acceptance: shall mean final written acceptance of all the Work by the Commissioner, a copy of which shall be sent to the Contractor.

#### 1.5 SUBSTANTIAL COMPLETION:

- A. Preliminary Procedures: Before requesting inspection to determine the date of Substantial Completion, the Contractor shall 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. 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 shall 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 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 shall request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
  - 2 Results of completed inspection will form the basis of requirements for Final Acceptance.

#### 1.6 FINAL ACCEPTANCE:

- A. Preliminary Procedures: Before requesting final inspection for Final Acceptance of the Work, the Contractor shall 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 Record 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, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS.
  - 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 shall state that each item has been completed or otherwise resolved for acceptance, and shall 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, spare parts, extra stock 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 shall 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 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. The items of materials and/or equipment for which manufacturer warranties are required are listed in Schedule B of the Addendum. For each item of material and/or equipment listed in Schedule B, 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 in Schedule B and will be replaced or repaired within such specified period. The contractor shall 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 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 entire Project or for a portion of 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 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.

### 3.2 REPAIR OF THE WORK:

- A. Subject to the terms of the Contract the Contractor shall complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Contractor shall 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.





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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 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, Department of Buildings (DoB); Department of Transportation (DoT); Department of Environmental Protection (DEP); Fire Department (FDNY); etc. Documentation to include, but 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.
  - 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 Record Documents as described in Section 01 78 39, CONTRACT RECORD DOCUMENTS, including but not limited to; approved documentation from Governing Authorities; as-built record drawings and specifications; product data; operation and maintenance manuals; Final Completion construction photographs; damage or settlement surveys; final property surveys; and similar final record information. 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 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, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED 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, spare parts, extra materials, 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.
15. Complete final cleaning requirements, including touchup painting.
16. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.



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**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. As-built Contract Record Drawings.
  2. As-built marked-up copies of Record Specifications, addenda and Change Orders.
  3. As-built marked-up Product Data
  4. Record Samples
  5. Construction Record Photographs
  6. Operating and Maintenance Manuals
  7. Final Site Survey
  8. Guarantees and Warranties
  9. Waste Disposal Documentation
  10. LEED Materials and Matrix
  11. Miscellaneous Record Submittals
- B. The Department of Design and Construction, at the start of construction (kick-off meeting), will furnish to the Contractor at no cost a complete set of Contract Drawings Mylars (reproducible) 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 Mylar (reproducible) drawings, if necessary, such as Addenda Drawings and Supplementary Drawings as may be necessary to indicate all work in detail as actually completed. All professional seals must be blocked out. Title box complete with project title and Design Consultants' names will remain.
- C. Maintenance of Documents and Samples: The Contractor shall maintain, during the progress of the work, an accurate record of the work as actually installed, on Contract Record Drawings, on Mylar (reproducible), in ink. Store record documents and samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain 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.

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 shall also show all connections, valves, gates, switches, cut-outs and similar operating equipment.

For projects designated to achieve a LEED rating the Contractor shall 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 shall 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.
- B. Design Consultant: "Design Consultant" shall 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.

**1.5 SUBMITTALS:**

- A. As-Built Contract Record Drawings: Comply with the following:
  1. Progress Submission: As directed by the Resident Engineer, submit progress As-Built Contract Record Drawings at the 50% Construction Completion stage.
  2. Final Submission: Before substantial completion payment, the Contractor shall furnish to the Commissioner one (1) complete set of marked-up Mylar (reproducible) As-Built Contract Record Drawings, in ink indicating all of the work and locations as actually installed, plus one (1) set of paper prints which will be furnished to the sponsoring agency by DDC.
  3. As-Built Contract Record Drawings shall 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 shall bear the legend "AS-BUILT CONTRACT RECORD DRAWING" in heavy block lettering, one half (1/2) 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. Record Drawing Title Sheet: The Contractor shall prepare a title sheet, the same size as the Contract Record Drawings, which shall 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 negatives 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 shall 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, 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 shall 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 Commissioning Authority/Agent (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 shall 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 shall maintain one set of blue- or black-line white prints as applicable of the Contract Drawings and Shop Drawings. If applicable, the Record Contract Drawings and Shop Drawings shall 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 shall mark Record Prints 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 shall be distinctly encircled and identified by Change Order number correlating to changes listed on the "Title Sheet." The Contractor shall 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 Drawings.
  2. Revisions to details shown on 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.
  14. Record information on the Work that is shown only schematically.
- C. Progress Record Mylar's (reproducible): As directed by the Resident Engineer at 50% construction completion, review marked-up Record Prints with the Resident Engineer and the Design Consulting. When directed by the Resident Engineer transfer progress mark-ups to a full set of Mylar's (reproducible) and submit one blue line or black line record copy to the Resident Engineer. The marked-up Mylar's (reproducible) shall be retained by the contractor for completion of mark-up and final submission.
- D. Final Contract Record Mylar's (reproducible): Immediately before final inspection for Certificate of Substantial Completion, review marked-up Record Prints with the Resident Engineer and the Design Consulting. When authorized, complete mark-up of a full set of corrected Mylar's (reproducible) 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. Print the As-Built Contract Drawings and Shop Drawings for use as Record Transparencies 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 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 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 shall meet with the Resident Engineer at the site to determine which of the Samples maintained during the construction period shall 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 OPERATING AND MAINTENANCE MANUALS:

- A. The Contractor shall 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 shall be the same color. When multiple binders are used, correlate data into related consistent groupings. Binder front shall 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 shall 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. Arrange content by systems under Specification Section numbers and sequence of Table of Contents of the Project manual. Provide tabbed flyleaf for each separate product, equipment and/or system/subsystem with typed description of product and major component parts of equipment.
- E. Safety warnings or cautions shall be visibly highlighted within each maintenance procedure. Use of such highlights shall be limited to only critical items and shall not be used in an excessive manner which would reduce their effectiveness.
- F. 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.
- G. 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.
- H. All material within manuals shall be new. Copies used for prior submittals or used in construction shall not be used.
- I. Submit preliminary and final manual editions to the Commissioner according to the approved progress schedule.
- J. Manuals shall present all technical material to the greatest extent possible, with respect to text, tabular matter and illustrations. Illustrations shall preferably consist of line drawings. All applicable drawings shall be included. If available, color photograph prints may be included.
- K. Preliminary manual editions shall be as technically complete as the final manual edition. All illustrations shall be in final forms.
- L. Final manual editions shall be technically accurate and complete and shall represent all "as-built" systems, pieces of equipment, or materials, which have been accepted by the Commissioner. All illustrations, text and tabular material shall be in final form. All shop drawings shall be included as specified in individual Specification Sections.
- M. 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.
- N. Instructions for care and maintenance: Include manufacturers' recommendations for cleaning agents and methods, and recommended schedule for cleaning and maintenance.



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- O. 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.
- P. Additional Requirements: Specified in individual Specification Sections.

**2.6 DEMONSTRATION AND ORIENTATION DVD:**

- A. Non-Commissioned Projects: The Contractor shall submit final version of applicable Demonstration and Training DVD recordings in compliance with Section 01 79 00, DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

**2.7 GUARANTEES AND WARRANTIES:**

- A. SCHEDULE B – Requirements for guarantees and warranties for the Project are set forth in Schedule B, which is included as part of the Addendum.
- B. FORM – For all guarantee requirements set forth in Schedule B, the Contractor shall provide a written guaranty, in the form set forth herein.
- C. Submit fully executed and signed manufacturers' Warranties as listed in the Project Specifications and outlined in Schedule B of the Addendum. Refer to Section 01 77 00, CLOSEOUT PROCEDURES for submittal requirements.



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### 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



**2.8 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.

**2.9 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 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 Project.
- B. Maintenance of Record Documents and Samples: Store 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 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 79 39**



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No Text



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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 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 videotapes. (Non-Commissioned Projects)
- B. The Contractor shall provide the services of equipment manufacturers orientation specialists experienced in the type of equipment to be demonstrated.
- C. Separate Orientation sessions shall 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 shall 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.

**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
- F. Specific requirements for demonstration and training 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.



- B. Design Consultant: "Design Consultant" shall 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.

## 1.5 SUBMITTALS:

- A. Instruction Program: Submit three (3) copies of outline of 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 training, submit three (3) complete training manual(s) and three (3) applicable DVD 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 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 material to the Resident Engineer a minimum of fourteen (14) days prior to the scheduled training.
- F. Demonstration and Orientation Recordings:
1. Non-Commissioned Projects:
- a. The Contractor shall submit to the Commissioner three (3) copies of Demonstration and Orientation DVD (Digital Video Disk) recordings within seven (7) days of end of each training 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.
2. Commissioned Projects:
- a. Demonstration and Orientation DVD recordings for Commissioned projects will be recorded by the Commissioning Authority/Agent (CxA) under separate contract with the City of New



York. The Contractor performing Demonstration and Orientation shall cooperate with the CxA in the recording of each Demonstration and Orientation module.

#### 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 to comply with requirements in 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. 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.
  - h. Performance curves.
2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Project Record Documents.
    - e. Identification systems.
    - f. Warranties
  3. 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.
    - f. Special operating instructions and procedures.
  4. 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.
    - m. Special operating instructions and procedures.
  5. Adjustments: Include the following:
    - a. Alignments.
    - b. Checking adjustments.
    - c. Noise and vibration adjustments.
    - d. Economy and efficiency adjustments.
  6. Troubleshooting: Include the following:
    - a. Diagnostic instructions.
    - b. Test and inspection procedures.
  7. 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.
  - h. Housekeeping practices
8. 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.
  - e. Review of spare parts needed for operation and maintenance.

### **PART III – EXECUTION**

#### **3.1 INSTRUCTION:**

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training 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 shall engage qualified instructors to instruct 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 times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  - 1. Schedule orientation with the Resident Engineer with at least fourteen (14) days' advance notice.
- D. Evaluation: At conclusion of each orientation module, assess and document each participant's mastery of module(s) by use of an oral a written or a 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 RECORDINGS:**

- A. Non-Commissioned projects:
  - 1. The Contractor shall engage a qualified commercial Videographer to 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 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 DVD (Digital Video Disk) format.
  - 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.



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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 each contractor. The provider of the Orientation program will videotape the sessions and provide a copy to the CxA for final review and comments. If necessary, Contractor shall edit the DVD recording per CxA comments.

END OF SECTION 01 79 00



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**SECTION 01 81 13  
SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS**

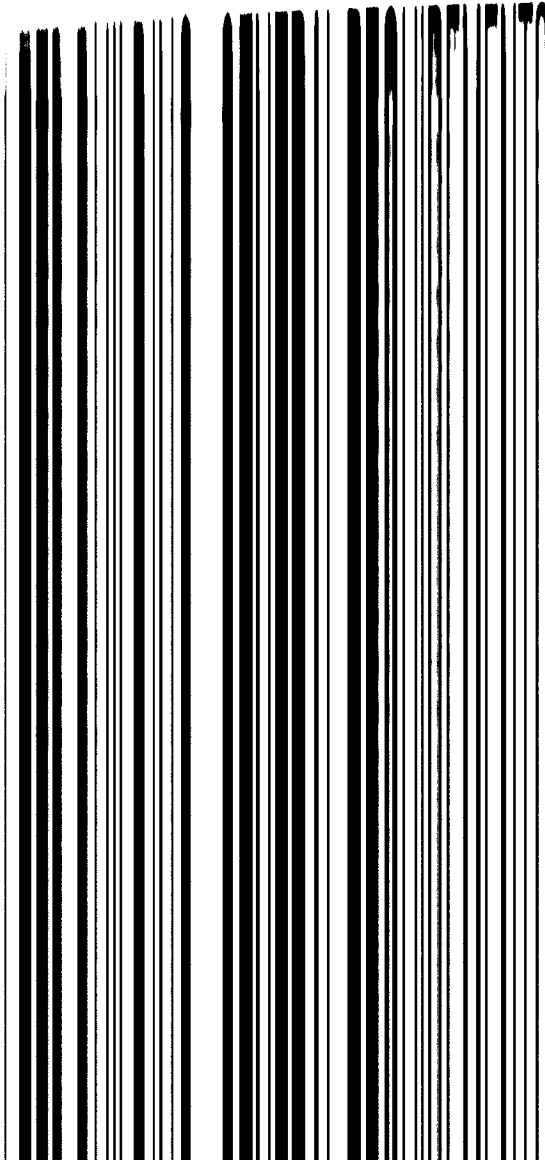
**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13**

**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].

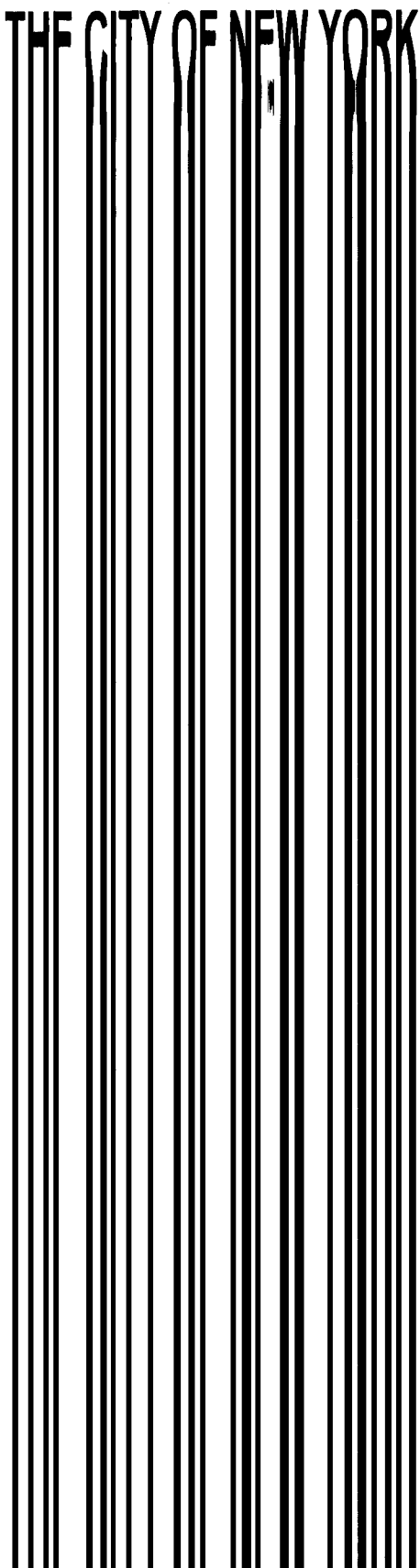
**1.2 SUMMARY:**





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THE CITY OF NEW YORK





**SECTION 01 81 13  
SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 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. 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 shall 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, shall 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,<br>SEALANTS, PAINTS AND COATINGS |
| C. | Section 01 81 19    | INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS                                     |
| D. | Section 01 91 13    | GENERAL COMMISSIONING REQUIREMENTS   |

**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. 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.

- C. 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.
- D. Design Consultant: "Design Consultant" shall 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.
- E. Forest Stewardship Council (FSC) Certified Wood: Wood-based materials and products certified in accordance with the Forest Stewardship Council's principles and criteria.
- F. LEED: The Leadership in Energy & Environmental Design rating system developed by the United States Green Building Council.
- G. Rapidly Renewable Materials: 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.
- H. Regionally Manufactured Materials: 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.
- I. Regionally Extracted, Harvested, or Recovered Materials: Materials which are extracted, harvested, or recovered and manufactured within a radius of 500 miles from the Project site.
- J. 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).
  - 1. 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.
  - 2. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.
  - 3. "Pre-consumer" may also be referred to as "post-industrial".
- K. 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.
- L. Volatile Organic Compound (VOC): Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs.



### 1.5 LEED PROVISIONS:

- A. Refer to the Addendum for the LEED rating to be achieved for this project. The provisions to achieve this LEED rating are integrated within the project construction documents and specifications. The Contractor is specifically directed to the "LEED BUILDING Performance Criteria" and "LEED BUILDING Submittals" sections within the contract specification. Additional LEED requirements are met through aspects of the project design, including material and equipment selections, which may not be specifically identified as LEED BUILDING requirements. Compliance with the requirements needed to obtain LEED prerequisites and credits will be used as one criterion to evaluate substitution requests.

### 1.6 LEED BUILDING SUBMITTALS:

- A. Scope: LEED BUILDING submittals are required for all installed materials included in General Construction work. LEED BUILDING Submittals are only required for field-applied adhesives, sealants, paints and coatings included in Plumbing, Mechanical and Electrical work. Submit all required LEED BUILDING submittals in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.
- B. Applicability: The extent of the LEED BUILDING Submittals varies depending on the specification section. Applicable LEED BUILDING Submittals are listed under the "LEED BUILDING Submittals" heading in each specification section. The detailed requirements for the LEED BUILDING Submittals are defined in Item C below.
- C. Detailed Requirements: Sub-Sections 1.6 C.1 through 1.6 C.3 below defines the information and documents to be provided for each type of LEED BUILDING Submittal as identified in the LEED Submittal Requirements of each specification section:
1. ENVIRONMENTAL BUILDING MATERIALS CERTIFICATION FORM (EBMCF)[GHI]: Information to be supplied for this form (blank sample copy attached at end of this Section to be modified as appropriate to the project) shall 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 shall include itemized material costs (excluding the contractor's labor, equipment, overhead and profit).
    - b. The percentages (by weight) of post-consumer and/or post-industrial recycled content in the supplied product(s).
      1. For each product with recycled content, also indicate the total recycled content value ( $1/2 \times \text{pre-consumer percentage} \times \text{product value} + 1 \times \text{post-consumer percentage} \times \text{product value} = \text{total recycled content value}$ ).
      2. See additional requirements for concrete below.
    - c. Identification (Yes/No) of materials manufactured within 500 miles of the project site AND containing raw materials harvested or extracted within 500 miles of the project site.
      - 1) Indicate the percentage by weight, relative to the total weight of the product that meets these criteria.
      - 2) Indicate the point of harvest/extraction/recovery of regional raw materials, the point of final assembly of regional manufactured products, and the distance from each point to the project site.
    - d. Volatile Organic Compound (VOC) content of all field-applied adhesives, sealants, paints, and coatings, listed in grams/liter or lbs./gallon, less water.
      - 1) For detailed requirements refer to Section 01 81 13.13 VOC LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS.
    - e. The amount of "Forest Stewardship Council (FSC) Certified" wood products if used in the Project.
      - 1) Record only new FSC-certified wood products. Do not record reclaimed, salvaged, or recycled FSC-certified wood products.





- 2) Reclaimed, salvaged, or recycled FSC-certified wood may be recorded as post-consumer recycled content.
  - f. The amount of Rapidly Renewable materials if used in the Project.
    - 1) Indicate the type of rapidly renewable material used, and the percentage by weight, relative to the total weight of the product, that consists of rapidly renewable material.
  - g. The percentage (by weight), relative to the total weight of cementitious materials, of supplementary cementitious materials or pozzolans such as fly ash used in each concrete mix used in the Project.
    - 1) For each concrete mix, provide a complete breakdown of all components, by weight and by cost.
  - h. Identification (Yes/No) of composite wood or agrifiber products used in the project that are free of added urea-added formaldehyde resins.
  - i. Identification (Yes/No) of flooring products used in the project that have Carpet and Rug Institute (CRI) Green Label or Green Label Plus certification, or Resilient Floor Covering Institute FloorScore certification.
    - 1) Untreated solid wood flooring, and mineral-based flooring products such as tile, masonry, terrazzo, and cut stone that have no organic-based coatings or sealants, are excluded from this requirement.
  - j. The EBMCF shall record the above information only for those materials or products permanently installed in the project. The EBMCF shall 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 (1<sup>st</sup> edition, May 1993)
  - b. Anti-corrosive and Anti-rust paints: refer to Green Seal standard GC-03 (2<sup>nd</sup> Edition, January 1997)
  - c. Aerosol Adhesives: refer to Green Seal standard GS-36 (1<sup>st</sup> 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 shall be calculated according to ASTM E 1980. Reflectance shall be measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance shall be measured according to ASTM E 408 or ASTM C 1371.
10. **HIGH ALBEDO ROOFING MATERIALS:** For exposed roofing membranes, pavers, and ballast products, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the following minimum Solar Reflectance Index (SRI) values:
  - a. 78 for low-sloped roofing applications (slope  $\leq$  2:12)
  - b. 29 for steep-sloped roofing applications (slope  $>$  2:12)

SRI values shall be calculated according to ASTM E 1980. Reflectance shall be measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance shall 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 shall 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 shall 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 shall 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.
    - 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 shall 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 shall be responsible for the provision, maintenance, and repair of all ESC measures.
  - c. Demonstration. The Contractor shall provide on-site instruction of proper construction practices required to prevent erosion and sedimentation.
  - d. Meetings. Urgent or ongoing ESC issues shall be discussed at weekly on-site job meetings.

#### 1.9 QUALITY ASSURANCE:

- A. The Contractor shall 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 shall be 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 shall be responsible for distributing the EBMCF and any other forms or templates required for the subcontractors to record LEED documentation. The Contractor shall 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 shall 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**



NO TEXT



**SECTION 01 81 13.13**  
**VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED 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 shall 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 shall 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 | SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS |
| I. | Section 01 81 19 | INDOOR AIR QUALITY FOR LEED BUILDINGS              |

**1.4 DEFINITIONS:**

- A. **ADHESIVE:** Any substance used to bond one surface to another by attachment. Includes adhesive primers and adhesive bonding primers.
1. **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.
- B. **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).

- C. **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.
- D. **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.
- E. **FLOOR COATING:** Opaque coating applied to flooring. Excludes industrial maintenance coatings.
- F. **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.
- G. **MUTAGEN:** A chemical that meets the criteria for category 1, chemicals known to induce heritable mutations or to be regarded as if they induce heritable mutations in the germ cells of humans, under the Harmonized System for the Classification of Chemicals Which Cause Mutations in Germ Cells (United Nations Economic Commission for Europe, Globally Harmonized System of Classification and Labeling of Chemicals).
- H. **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.
- I. **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.
- J. **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.
- K. **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.).
- L. **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).
- M. **SEALANT:** Any material with adhesive properties, formulated primarily to fill, seal, or waterproof gaps or joints

between surfaces. Includes sealant primers and caulks.

- N. 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.
- O. STAIN: Clear semi-transparent/opaque coating formulated to change the color but not conceal the grain pattern or texture of the substrate.
- P. VOLATILE AROMATIC COMPOUND: Any hydrocarbon compound containing one or more 6-carbon benzene rings, and having an initial boiling point less than or equal to 280 degrees Celsius measured at standard conditions of temperature and pressure.
- Q. 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.
- R. 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 shall 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, shall 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](http://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](http://www.aqmd.gov)
- C. Green Seal Standard GS-11- “Paints”, of Green Seal, Inc., Washington, DC, [www.greenseal.org](http://www.greenseal.org)
- D. Green Seal Standard GC-03- “Anti-Corrosive Paints”, of Green Seal, Inc., Washington, DC, [www.greenseal.org](http://www.greenseal.org)

#### 1.6 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”) shall not be in excess of **250 grams per liter**.
- B. No product shall contain any ingredients that are carcinogens, mutagens, reproductive toxins, persistent bioaccumulative compounds, hazardous air pollutants, or ozone-depleting compounds. An exception shall be made for titanium dioxide and, for products that are pre-tinted by the manufacturer, carbon black, which shall be less than or equal to 1% by weight of the product.
- C. No product shall 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 shall 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 shall 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

VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES,  
SEALANTS, PAINTS & COATINGS FOR LEED BUILDINGS



- |    |  |     |
|----|--|-----|
| 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 shall 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.) shall 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:
5. Volatile Organic Compounds:
- a. The VOC concentrations (in grams per liter) of the product shall not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24.
- Interior Paints and Primers:  
 Non-flat: 150 g/l  
 Flat: 50 g/l  
 The calculation of VOC shall 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 shall 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 shall 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 shall 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 shall 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 shall 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 shall 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 SUSTAINABLE REQUIREMENTS FOR LEED BUILDINGS: For each field-applied adhesive, sealant, paint, and coating product, provide the VOC requirement, as provided in this Specification, for the relevant material category indicated on the documentation noted above.

**PART II – PRODUCTS (Not Used)**

**PART III – EXECUTION (Not Used)**

**END OF SECTION 01 81 13.13**



**SECTION 01 81 19  
INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 19**

**PART I – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

**1.2 CONSTRUCTION IAQ MANAGEMENT GOALS FOR THE PROJECT:**

- A. The City of New York has determined that this Project shall 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, poor housekeeping, shall 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. Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS
- C. Section 01 81 13.13, VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS.
- D. Division 9 (of the Specifications): Finishes.

**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" shall 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. Volatile Organic Compounds (VOC's): 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 VOC's are harmful, but many of those contained within building products contribute to the formation of smog and may irritate building occupants by their smell and/or health impact.

- D. 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 VOC’s emitted by “source” materials and release them over a prolonged period of time.
- E. Materials that act as “sources” for VOC contamination: Products with high VOC contents that emit VOC’s 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”, First Edition, November 1995, The Sheet Metal and Air Conditioner Contractors National Association (SMACNA). (703) 803-2980, [www.smacna.org](http://www.smacna.org).
- B. ANSI/ASHRAE 52.2-1999, “Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size”, [www.ashrae.org](http://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 shall not be allowed if such changes compromise the stated LEED BUILDING Performance Criteria.

#### 1.7 CONSTRUCTION IAQ MANAGEMENT PLAN :

- A. The Contractor shall prepare a Construction IAQ Management Plan in coordination with each subcontractor and submit the IAQ Management Plan to the Commissioner for approval in accordance with Section 01 33 00, SUBMITTAL PROCDEURES. The Construction IAQ Management Plan shall meet the following criteria:
  - 1. Construction activities shall be planned to meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors’ Association (SMACNA) “IAQ Guidelines for Occupied Buildings under Construction”, First Edition, 1995.
  - 2. Absorptive materials shall be protected from moisture damage when stored on-site and after installation.
  - 3. 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 grill, as determined by ASHRAE 52.2-1999.
  - 4. Filtration media shall be replaced immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999 if the project is pursuing Indoor Air Quality Credit 5: Indoor Chemical Pollutant Source Control.
  - 5. A “Sequence of Finish Installation Plan” shall be developed, highlighting measures to reduce the absorption of VOCs by materials that act as “sinks”.
  - 6. Upon approval of the Plan by the Commissioner, it shall 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. Further description of the Construction IAQ Management Plan requirements is 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 shall be organized in accordance with the SMACNA format, and shall address measures to be implemented in each of the five categories (including subsections). All subsections shall 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 and 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.
    - b. Source Control
      - 1) Protect stored on-site or installed absorptive or porous materials.
      - 2) Do not use wet or damaged porous materials in the building.
      - 3) 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.
      - 4) Exhaust fumes from idling vehicles and gasoline fueled tools through use of funnels or temporary piping.
      - 5) Containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications, shall be closed when not in use.
    - c. Pathway Interruption
      - 1) Depressurize work areas to 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.
    - 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 particulate filters. Activities which produce high levels of dust shall 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) Materials which become contaminated through direct exposure to moisture from





- precipitation, plumbing leaks, or condensation shall be replaced by the Contractor.
- 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 shall be a regular action topic at weekly site coordination meetings. Implementation of the Plan shall be documented in the meeting minutes.
2. Protection of Materials from Moisture Damage: As part of the “Housekeeping” section of the Construction IAQ Management Plan, measures to prevent installed materials or material stored on-site from moisture damage shall be described. This section should also describe measures to be taken if moisture damage does occur to absorptive materials during the course of construction.
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 shall be provided. The description shall 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 shall be installed after the installation of materials or finishes which have high short-term emissions of VOC's, 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. Develop and implement an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase as follows:

OPTION 1 — Flush-Out

- After construction ends, prior to occupancy and with all interior finishes installed, 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 relative humidity no higher than 60%.

OR

- 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 shall be ventilated at a minimum rate of 0.30 cfm/sq.ft. of outside air or the design minimum outside air rate determined in EQ Prerequisite 1, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14,000 cu.ft./sq.ft. of outside air has been delivered to the space.

OR



OPTION 2 — Air Testing

- Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with the United States Environmental Protection Agency Compendium of Methods for the Determination of Air Pollutants in Indoor Air and as additionally detailed in the LEED-NC Reference Guide.
- Demonstrate that the contaminant maximum concentrations listed below are not exceeded.

CONTAMINANT	MAXIMUM CONCENTRATION
Formaldehyde	27 parts per billion
Particulates (PM10)	50 micrograms per cubic meter
Total Volatile Organic Compounds (TVOC)	500 micrograms per cubic meter
* 4-Phenylcyclohexene (4-PCH)	6.5 micrograms per cubic meter
Carbon Monoxide (CO)	9 part per million and no greater than 2 parts per million above outdoor levels
* This test is only required if carpets and fabrics with styrene butadiene rubber (SBR) latex backing material are installed as part of the base building systems.	

- 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.
- The air sample testing shall be conducted as follows:
  - a. All measurements shall 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.
  - b. The building shall 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 encouraged, but not required, to be in place for the testing.
  - c. 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 shall 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.
  - d. Air samples shall 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.
- 6. Implementation and Coordination: Implement the Construction IAQ Management Plan, and coordinate the Plan with all affected trades. 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 Plan with the Commissioner on a regular basis, 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 shall distribute copies of the Construction IAQ Management Plan in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.
- b. Instruction: The Contractor shall provide on-site instruction of appropriate site management to all Contractor's Subcontractors.
- c. Monitoring: The Construction IAQ Representative shall monitor the implementation of the Construction IAQ Management Plan.

**1.8 SUBMITTALS:**

Submit the following LEED-required records and documents in accordance with Section 01 33 00, SUBMITTAL PROCEDURES and Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS.

- A. A copy of the Construction IAQ Management Plan as defined in Sub-Section 1.07 herein.
- B. Product cut-sheets for all filtration media used during construction and installed immediately prior to occupancy, with MERV values highlighted. Cut sheets shall be submitted with the Contractor's or Subcontractor's 'approved' stamp as confirmation that the products are the products installed on the project.
- C. Provide the Commissioner with 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. The photographs shall 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 shall include integral date stamping, and shall 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.
- D. A copy of the project's TAQ Testing report if applicable.

**1.9 QUALITY ASSURANCE:**

- A. The Contractor shall be responsible for preparing and implementing the Construction IAQ Management Plan and shall coordinate and incorporate the work of its subcontractors in the IAQ Management Plan.
- B. Responsibility of Subcontractors: Subcontractors for this project shall be responsible to cooperate with the Contractor in the preparation and implementation of the Construction IAQ Management Plan.

**PART II – PRODUCTS (Not Used)**

**PART III – EXECUTION (Not Used)**

**END OF SECTION 01 81 19**



**SECTION 01 91 13  
GENERAL COMMISSIONING REQUIREMENTS**

**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. OPR and BoD documentation 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.
- B. This Section includes:
  - 1. Definitions
  - 2. Commissioning Team
  - 3. City's Responsibilities
  - 4. Each Contractor's Responsibilities
  - 5. Commissioning Authority's/Agent's (CxA) Responsibilities
  - 6. Commissioning Documentation
  - 7. Submittals
  - 8. Coordination

**1.3 RELATED SECTIONS:** Include without limitation the following:

- A. "HVAC Commissioning Requirements" indicated in other sections of the project specifications for specific requirements for commissioning HVAC systems.
- B. This project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED procedures, and specific commissioning requirements of the Project Specifications, whichever is more stringent. The Contractor shall 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 OWNERS PRE-ACCEPTANCE ORIENTATION
  - 6. Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS 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.



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**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](http://www.nyc.gov/buildnyc)

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**Contract for Furnishing all Labor and Material Necessary**

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Contractor

Dated \_\_\_\_\_, 20\_\_\_\_

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Approved as to Form  
Certified as to Legal Authority

Acting Corporation Counsel

Dated \_\_\_\_\_, 20\_\_\_\_

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Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated \_\_\_\_\_, 20\_\_\_\_



FMS ID: LQQ122EE2



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

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

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

**East Elmhurst Branch Library  
Expansion**

LOCATION: 95-08 Astoria Boulevard  
BOROUGH: Queens 11369  
CITY OF NEW YORK

National Environmental Safety Co. Inc.  
Contractor

Dated June 27, 2016

Approved as to Form  
Certified as to Legal Authority

[Signature]  
Acting Corporation Counsel

JP  
5-28-15

Dated May 28, 2015

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated \_\_\_\_\_, 20\_\_\_\_





PROJECT ID:

LQQ122EE2

**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](http://www.nyc.gov/buildnyc)

**VOLUME 3 OF 3**

**ADDENDUM TO THE GENERAL  
CONDITIONS**

**SPECIFICATIONS**

FOR FURNISHING ALL LABOR AND MATERIALS  
NECESSARY AND REQUIRED FOR:

**East Elmhurst Branch Library  
Expansion**

LOCATION:  
BOROUGH:  
CITY OF NEW YORK

95-08 Astoria Boulevard  
Queens 11369

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

Queens Public Library

Garrison Architects

Date: December 30, 2014

5-101





NEW YORK CITY DEPARTMENT OF  
DESIGN + CONSTRUCTION

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

ADDENDUM TO THE GENERAL CONDITIONS  
FOR SINGLE CONTRACT PROJECTS

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The General Conditions are hereby amended in accordance  
with the terms and conditions set forth in this Addendum.

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I. PROJECT DESCRIPTION

FMS #: **LQQ122EE2**  
PROJECT NAME: **East Elmhurst Branch Library Expansion**

PROJECT DESCRIPTION:

This Project consists of a new 4,295 SF single story addition to the existing library on the adjacent property. The building is to be built in two phases to allow use of the facilities, with no more than three months interrupted operation at a time. The building is a steel frame structure with concrete block shear walls. The exterior envelope of the Young Adult area, Interior Court and Multi-Purpose Room below the level of the new roof is an aluminum curtain wall with high performance insulating glass. Above the roof /canopy level is a clerestory volume clad in aluminum louver, corrugated aluminum and fiber cement rain screen. Exterior doors are steel or glazed aluminum frame storefront. Over the Interior Courty and Young Adult area are self-structured aluminum and cellular polycarbonate skylights. The steel frame sits on a concrete foundation. Due to the poor soil conditions, the steel columns and floor slabs on grade bear on concrete grade beams which sit atop micropiles.

A roof top packaged unit feeds several VAV boxes for zoned HVAC distribution. There are two new restrooms and a small pantry, with gas, water and sanitary connections made to the existing library's plumbing. All roof drainage on the existing library property is fed to existing library's sanitary connection; all roof and yard drainage on the addition property is fed to a subterranean drywell in the Rear Yard. There is no existing or new sprinkler system. The fire alarm for the new addition is tied into the existing building's fire alarm. There is extensive lighting, some recessed, some surface mounted, to meet library standards and to serve the many needs of the multipurpose room. The Interior Court and Multi-Purpose room each have lighting control systems.

Interior walls are CMU and the floor is sealed concrete except at bathrooms which are tiled and the Young Adult and Computer area which is carpet tile. The Interior Court and Multi-Purpose Rooms are clad in walnut veneer plywood panels, some perforated for acoustical and light-admitting purposes. Other partitions are full-height fixed glass. The Pantry, Young Adult and Computer areas have custom walnut veneer cabinetry. Many of the doors are walnut veneered on heavy duty pivot hinges. A full-height manually operated movable partition can divide the Multi-Purpose Room. Interior signage is required.

Sitework includes new precast concrete pavers on concrete slab at the existing library entry, Rear Yard Terrace, and the new Multi-Purpose Room entry, continuing into the Interior Court. A metal mesh fence encloses the Rear Yard, which is landscaped with plantings, gravel pavement and a new tree. Five new street trees will be added, along with enlarging the existing street trees. The existing bike racks will be re-installed, along with the existing pin letter sign. A new aluminum sign will be added to the exterior of the storage shed, and new markings will be added to the glass doors and sidelights.

PROJECT LOCATION: **95-08 Astoria Boulevard**  
BOROUGH: **Queens**  
CITY OF NEW YORK  
ZIP CODE: **11369**  
COMMUNITY BOARD #: **3**



LANDMARK STATUS:

DESIGNATED LANDMARK STRUCTURE OR SITE: NO

If this is a Designated Landmark Structure or Site, Section 01 3591, Historic Treatment Procedures applies to this project.

LANDMARK QUALITY STRUCTURE: NO

If this is a Landmark Quality Structure, Section 01 3591, Historic Treatment Procedures applies to this project.

II. LEED GREEN BUILDING REQUIREMENTS

This project must achieve a Silver LEED Green Building Rating. A certain number of credits are required for this rating and are detailed in the Project Specifications. Sections 01 8113 Sustainable Design Requirements for LEED Buildings, 01 8113.13 VOC Limits for Adhesives, Sealants, Paints and Coatings for LEED Buildings, 01 8119 Indoor Air Quality Requirements for LEED Buildings, and 01 9113 General Commissioning Requirements of the DDC Standard General Conditions shall apply to this project.

Please note that only the work on the east adjacent lot (the East Entry, Interior Court, Multi-Purpose, Computing, Pantry, Hall, and Restrooms) shall be considered for LEED certification. This work shall be referred to the East Elmhurst Branch Library ANNEX for the application process with the USGBC. All work on the original property of the existing library will not be included in the LEED application. All record-keeping, including material quantities and costs, by the General Contractor shall distinguish the work accordingly.

III. COMMISSIONING REQUIREMENTS

This project includes Commissioning Requirements. The General Commissioning Requirements 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

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 F are attached to, and incorporated as part of, this Addendum to the General Conditions. These schedules contain important information that is specific to this Project. The Contractor is advised to carefully review these schedules.

## VII. APPLICABILITY OF SECTIONS/SUB-SECTIONS AND AMENDED SUB-SECTIONS

The Contractor is advised that various Sections/Sub-Sections in the General Conditions may not apply to this Project or may apply as amended. Such Sections/Sub-Sections advise the Contractor to "Refer to the Addendum for the applicability of this Section/Sub-Section." Such Sections/Sub-Sections are set forth below. A check mark indicates whether the Section/Sub-Section (1) applies to the Project, (2) does not apply to the Project, or (3) applies to the Project as amended. If no box is checked, the Section/Sub-Section, as set forth in the General Conditions, applies to the Project. Amended Sections/Sub-Sections, if any, are set forth following this list of Sections.

<u>Section</u>	<u>Sub-Section</u>	<u>Sub-Section</u>	<u>Applies</u>	<u>Does not Apply</u>	<u>Applies as Amended</u>
<b>01 1000</b>	1.4 (B)	Scope and Intent / LEED	x		
	1.4(C)	Scope and Intent / Commissioning	x		
<b>01 3233</b>		Photographic Documentation	x		
<b>01 3300</b>	1.7 (A-D)	LEED Submittals	x		
<b>01 3503</b>		General Mechanical Requirements	x		
<b>01 3506</b>	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		
<b>01 3591</b>		Historic Treatment Procedures		x	
<b>01 5000</b>	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) 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		

<u>Section</u>	<u>Sub-Section</u>	<u>Sub-Section</u>	<u>Applies</u>	<u>Does not Apply</u>	<u>Applies as Amended</u>
01 5000	3.8 (A)	DDC Field Office / Office Space in Existing Building		x	
	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		Sustainable Design Requirements for LEED Buildings	x		
01 8113.13		VOC Limits for Adhesives, Sealants, Paints and Coatings for LEED Buildings	x		
01 8119		Indoor Air Quality Requirements for LEED Buildings	x		
01 9113		General Commissioning Requirements	x		

#### AMENDED SECTIONS/SUB-SECTIONS

The Contractor is advised that the amended Sub-Sections set forth below are included in the General Conditions and apply to the Project.

#### Section 015000 Temporary Facilities Services and Control: Add Article 3.13, Section E

- E. General Contractor shall prepare and provide all required documents, signed and stamped by Professional Engineer or Architect licensed in the State of NY, to file for, obtain approval for, and obtain a permit from the Department of Buildings for a sidewalk fence and overhead protection as illustrated on drawing D-100.00 and as required to provide general protection to the public, and protection for public access to the Library during the construction process.

## ADDITIONAL ARTICLES

The Contractor is advised that the additional Articles set forth below are included in the General Conditions and apply to the Project.

### Section 011000 Summary: Add Article 1.13 Phasing

- A. The Contractor is to provide the Project in two (2) phases as indicated in the Construction Documents. Phase 1 Partial Demolition shall not impact the operation of the existing facility beyond the extent of demolition indicated in the drawings. The Contractor is to furnish and install protection, signage and temporary construction as required to provide the existing building with a code compliant temporary entrance for the duration of Phase 1.
- B. For the duration of Phase 1, the existing building is to remain fully accessible and in full operation.
- C. As part of Phase 1, the new facility must be water tight and fully enclosed. All systems must be in full operation at the end of Phase 1.
- D. Within three months of completion of Phase 1, the Contractor must provide notification to the City of New York to temporarily close the existing library in order to commence Phase 2. Upon completion of Phase 1, the library will be closed for no longer than three months, during which time the work within the existing library and the connections between new construction and existing building must be sufficiently complete to obtain a Temporary Certificate of Occupancy and allow for library operations to resume.

### VIII. SPECIAL EXPERIENCE REQUIREMENTS FOR THE PROJECT

Special experience requirements apply for the Bidder (Prime Contractor). Refer to page 3 of the Bid Booklet for further information.

## 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 Bid Booklet contains a Notice which identifies a particular product from a designated manufacturer as a "Proprietary Item", 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 Bid Booklet. Special Experience Requirements may apply to contractors, subcontractors, installers, manufacturers and/or suppliers. If the Specifications and/or the Contract Drawings contain any Special Experience Requirement that is not set forth in the Bid Booklet, 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, except as described in paragraph (b) below.
  - (b) Any Special Experience Requirement that pertains to the abatement of hazardous materials shall not be subject to the deletion and/or revision set forth above. Such Special Experience Requirement shall remain in full force and effect.
  - (c) Any Special Experience Requirement that provides that the entity 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 entity must be properly trained for the specified work.
  - (d) 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 Bid Booklet. In the event of any conflict or inconsistency between (1) the Notice regarding Alternate Bids set forth in the Bid Booklet and (2) a provision in the Specifications and/or the Contract Drawings regarding Alternate Bids, the Notice set forth in the Bid Booklet shall prevail. If the agency is not requesting the submission of Alternate Bids, as indicated by the absence of a Notice in the Bid Booklet, 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, 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, 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) 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.
  - (b) 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.
  - (c) 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.

**SCHEDULE A (FOR PUBLICLY BID PROJECTS)**  
**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 each separate contract.

REFERENCE	ITEM	REQUIREMENTS	CONTRACT #1
Article 14 Contract	Time of Completion	Consecutive Calendar Days	730 CCDs
Article 15 Contract	Liquidated Damages	For each consecutive calendar day over completion time	\$600
Article 17 Contract	Sub-Contracts	Not to exceed Percent of Contract Price	60%
Article 21 Contract	Retainage	Percent of Voucher	If 100% bonds are required 5% If 100% bonds are not required, and Contract Price is less than \$500,000 10% If 100% bonds are not required, and Contract Price is more than \$500,000 10%
Article 24 Contract	Maintenance & Guaranty	Percent of Contract Price	1%
Article 76 Contract	MWBE Program		See Subcontractor Utilization Plan In the Bid Booklet

**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
<ul style="list-style-type: none"> <li>■ Commercial General Liability      Art. 22.1.1</li> </ul>	<p>The minimum limits shall be \$1,000,000.00 per occurrence and \$2,000,000.00 per project aggregate applicable to this <b>Contract</b>.</p> <p>Additional Insureds:</p> <ol style="list-style-type: none"> <li>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</li> <li>2. All person(s) or organization(s), if any, that Article 22.1. 1(b) of the <b>Contract</b> 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).</li> <li>3. _____</li> </ol>
<ul style="list-style-type: none"> <li>■ Workers' Compensation              Art. 22.1.2</li> <li>■ Disability Benefits Insurance        Art. 22.1.2</li> <li>■ Employers' Liability                    Art. 22.1.2</li> <li><input type="checkbox"/> Jones Act                                    Art. 22.1.3</li> <li><input type="checkbox"/> U.S. Longshoremen's and Harbor Workers Compensation Act      Art. 22.1.3</li> </ul>	<p>Workers' Compensation, Employers' Liability, and Disability Benefits Insurance: Statutory per New York State law without regard to jurisdiction.</p> <p><b>Note:</b> The following forms are acceptable: (1) New York State Workers' Compensation Board Form No. C-105.2, (2) State Insurance Fund Form No. U-26.3, (3) New York State Workers' Compensation Board Form No. DB-120.1 and (3) Request for WC/DB Exemption Form No. CE-200. The City will not accept an ACORD form as proof of Workers' Compensation or Disability Insurance.</p> <p>Jones Act and U.S. Longshoremen's and Harbor Workers' Compensation Act: Statutory per U.S. law.</p>





**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
<input type="checkbox"/> Hull and Machinery Insurance      Art. 22.1.7(b)	\$ _____ per occurrence  \$ _____ aggregate  Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
<input type="checkbox"/> Marine Pollution Liability      Art. 22.1.7(c)	\$ _____ each occurrence  Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER]      Art. 22.1.8  <input type="checkbox"/> Ship Repairers Legal Liability	\$ _____ each occurrence
[OTHER]      Art. 22.1.8  <input type="checkbox"/> 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  <input type="checkbox"/> Railroad Protective Liability	\$ _____ per occurrence  \$ _____ aggregate  Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____

**SCHEDULE A (FOR PUBLICLY BID PROJECTS)**

**Relating to Article 22 - Insurance**

**PART II. Types of Insurance, Minimum Limits and Special Conditions (Continued)**

Insurance indicated by a blackened box (■) or by (X) in the  to left will be required under this contract.

<p>[OTHER] <span style="float: right;">Art. 22.1.8</span></p> <p>■ Asbestos Liability _____</p>	<p>Only required of the Contractor or Subcontractor performing any required asbestos removal.</p> <p>\$1,000,000 each occurrence, \$2,000,000 aggregate (Combined Single Limit); only required of the Contractor or Subcontractor performing any required asbestos removal.</p> <p>Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____</p>
<p>[OTHER] <span style="float: right;">Art. 22.1.8</span></p> <p>□ Boiler Insurance _____</p>	<p>\$200,000</p>
<p>[OTHER] <span style="float: right;">Art. 22.1.8</span></p> <p>■ Professional Liability</p> <p>In the event any section of the Specifications requires the Contractor to engage a Professional Engineer to provide design and/or engineering services, the Engineer engaged by the Contractor, as well as any sub consultant(s) performing professional services, shall provide Professional Liability Insurance.</p>	<p>\$1,000,000 per occurrence</p> <p>The Contractor's Professional Engineer shall maintain and submit evidence of Professional Liability Insurance in the minimum amount of \$1,000,000 per claim. The policy or policies shall include an endorsement to cover the liability assumed by the Contractor under this Agreement arising out of the negligent performance of professional services or caused by an error, omission or negligent act of the Contractor's Professional Engineer or anyone employed by the Contractor's Professional Engineer.</p> <p>Claims-made policies will be accepted for Professional Liability Insurance. All such policies shall have an extended reporting period option or automatic coverage of not less than two (2) years. If available as an option, the Contractor's Professional Engineer shall purchase extended reporting period coverage effective on cancellation or termination of such insurance unless a new policy is secured with a retroactive date, including at least the last policy year.</p>

**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 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 shall be sent to the address set forth below or, in the absence of such address, to the **Commissioner's** address as provided elsewhere in this **Contract**.

ACCO's Office, Insurance Unit

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30-30 Thomson Avenue, 4<sup>th</sup> Floor

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Long Island City, New York 11101

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**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
071326	Sheet Membrane Waterproofing	three (3) years
074600	Aluminum Siding	twenty (20) years
074600	Fiber Cement	ten (10) years
075200	Modified Bitumen Roofing	twenty (20) years
081400	Wood Doors (Solid Core Flush)	lifetime
081400	Wood Doors (Stile and Rail)	five (5) years
084100	Aluminum Entrances & Storefront (finish)	fifteen (15) years
084100	Aluminum Entrances & Storefront	three (3) years
084413	Glazed Aluminum Curtain Walls (finish)	fifteen (15) years
084413	Glazed Aluminum Curtain Walls	two (2) years
085100	Aluminum Windows	ten (10) years
086310	Polycarbonate Insulating Panel Skylights	ten (10) years
087100	Door Hardware (mortise locks & latches)	ten (10) years
087100	Door Hardware (extra heavy-duty cylindrical locks/latches)	ten (10) years
087100	Door Hardware (heavy-duty cylindrical locks/latches)	seven (7) years

087100	Door Hardware (std-duty cylindrical locks/latches)	five (5) years
087100	Door Hardware (exit hardware)	five (5) years
087100	Door Hardware (manual door closers)	twenty-five (25) years
087100	Door Hardware (electromechanical)	two (2) years
088000	Glass and Glazing (coated glass products)	five (5) years
088000	Glass and Glazing (insulating glass)	ten (10) years
088000	Glass and Glazing (laminated glass)	ten (10) years
089000	Louvers and Vents (finish)	twenty (20) years
096800	Carpeting	five (5) years
102226	Operable Partitions	two (2) years
113100	Residential Appliances	one (1) year
122400	Window Shades	five (5) years
223300	Electric Domestic Water Heater Accessories	one (1) year
237432	Packaged Rooftop Units (compressors)	five (5) years
237432	Packaged Rooftop Units (parts, materials)	one (1) year
237432	Packaged Rooftop Units (furnace)	twenty five (25) years
260923	Lighting Control Devices	three (3) year
260936	Modular Dimming Controls	two (2) years
262727	Wireless Wiring Devices	one (1) year
265000	Architectural Lighting (ballasts, HID ballasts)	five (5) years
265000	Architectural Lighting (exterior fixture finish)	five (5) years
265000	Architectural Lighting (LED fixtures)	three (3) years
280000	Electronic Safety and Security (Cabling)	fifteen (15) years
280000	Electronic Safety and Security (Fiber Optics)	fifteen (15) years
280000	Electronic Safety and Security (Racks/Consoles)	ten (10) years
283100	Fire Alarm System	one (1) year
321413	Precast Concrete Pavers	one (1) year

**(3) Application:** The obligations under the warranty for the periods specified above shall apply only to the manufacturer of the material or equipment, and not to the Contractor or its Surety; provided, however, the Contractor retains responsibility for obtaining all required warranties from the manufacturers and delivering the same to the Commissioner.

**(4) Other Provisions:** The warranty requirements set forth in this Schedule B are also included in the Specifications.

- (a) In the event of any conflict between a warranty requirement set forth in the Specifications and a warranty requirement set forth in Schedule B, the warranty requirement set forth in Schedule B shall take precedence.
- (b) In the event a warranty requirement set forth in the Specifications is omitted from Schedule B, such omission from Schedule B shall have no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications, shall remain in full force and effect
- (c) In the event a warranty requirement for a particular item of material or equipment is omitted from both Schedule B and the Specifications, and the manufacturer of such item actually provides a warranty, the Contractor shall be obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by that manufacturer.
- (d) In the event a warranty requirement is provided for a particular item of material or equipment, and such requirement specifies a warranty period that is longer than that which is actually provided by any of the specified manufacturers, the Contractor shall be obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by any of the specified manufacturers, unless otherwise directed in writing by the Commissioner.
- (e) Unless indicated otherwise Warranties are to take effect on the date of Substantial Completion.



## SCHEDULE C

### Contract Drawings

(Reference: Section 01 1000, Article 1.5 (A) of the DDC Standard General Conditions)

The Schedule set forth below lists all Contract Drawings for the Project.

A-000.00	Cover Sheet
A-001.00	General Notes, Abbreviations & Drawings Index
A-002.00	Building Code Notes, Zoning Notes & Diagrams
A-003.00	Code Diagrams
A-004.00	Site Survey

#### **CIVIL**

C-001.00	General Notes and Details
C-100.00	Site Drainage Plan
C-101.00	Site Drainage Details
C-102.00	Builder's Pavement Plant
C-103.00	Erosion & Sediment Control Notes & Details

#### **LANDSCAPE**

L-100.00	General Notes and Details
L-200.00	Site Elevations - Fence
L-300.00	Site Details

#### **ARCHITECTURAL**

D-001.00	Demolition Plan
D-002.00	Demolition Plans & Elevations

#### **ASBESTOS ABATEMENT**

H-001.00	Asbestos Abatement General Notes
H-002.00	Asbestos Abatement Ground Floor

#### **ARCHITECTURAL**

A-101.00	Floor Plan
A-111.00	Reflected Ceiling Plan
A-121.00	Roof Plan
A-201.00	Building Elevations
A-301.00	Building Sections
A-302.00	Building Sections
A-401.00	Enlarged Drawings: Multi-purpose Room
A-402.00	Enlarged Drawings: Interior Courtyard
A-403.00	Enlarged Drawings: Young Adult Room
A-404.00	Enlarged Drawings: Computing Room
A-405.00	Enlarged Drawings: Service Area
A-501.00	Wall Sections
A-502.00	Wall Sections
A-503.00	Wall Sections
A-504.00	Wall Sections
A-505.00	Wall Sections
A-506.00	Wall Sections

(cont'd)

A-507.00	Wall Sections
A-508.00	Wall Sections
A-509.00	Wall Sections
A-510.00	Exterior Details
A-511.00	Exterior Details
A-512.00	Exterior Details
A-513.00	Exterior Details
A-514.00	Exterior Details
A-515.00	Exterior Details
A-516.00	Exterior Details
A-517.00	Exterior Details
A-518.00	Exterior Details
A-519.00	Enlarged Elev & Details – Outdoor Storage Signage
A-601.00	Interior Details
A-602.00	Interior Details
A-603.00	Interior Details
A-604.00	Interior Details
A-605.00	Interior Details
A-606.00	Interior Details
A-607.00	Interior Details
A-610.00	Millwork Details
A-611.00	Millwork Details
A-612.00	Wood Panel Perforation Types
A-701.00	Door, Frame, Window Types & Schedule
A-702.00	Schedules
A-703.00	Wall Types

## **STRUCTURAL**

FO-100.00	Foundation
S-101.00	First Floor
S-102.00	Roof Framing
S-200.00	General Notes and Abbreviations
S-201.00	Typical Details
S-202.00	Typical Details
S-203.00	Typical Details
S-300.00	Foundation Details
S-301.00	Foundation Details
S-400.00	Framing Details

## **MECHANICAL**

M-001.00	Mechanical Symbols, General Notes & Abbrev's
M-100.00	First Floor Mechanical Plan
M-101.00	Roof Mechanical Plan
M-401.00	Mechanical Schedules
M-501.00	Mechanical Details
M-502.00	Mechanical Details

## **PLUMBING**

P-001.00	Plumbing Legend, Notes, Schedule & Plot Plan
P-100.00	First Floor Plumbing Plan
P-101.00	Roof Plumbing Plan
P-200.00	Plumbing Riser Diagrams
P-300.00	Plumbing Details

(cont'd)

**ELECTRICAL**

E-001.00 Electrical Symbols & Abbreviations  
E-002.00 Electrical General Notes  
E-100.00 First Floor Electrical Plan  
E-101.00 Electrical Roof Plans  
E-200.00 First Floor Lighting Plan  
E-301.00 Electrical Diagram & Panel Board Schedule  
E-302.00 Lighting Controls One Line Diagrams  
E-401.00 Equipment Schedules

**ENERGY CODE**

EN-001.00 Energy Code Compliance Sheet

**FIRE PROTECTION – FIRE ALARM**

FA-001.00 Fire Alarm Symbols, Abbreviations and Notes  
FA-100.00 First Floor Fire Alarm Plan  
FA-301.00 Fire Alarm One Line Diagram

**SECURITY**

SE-001.00 Symbols and Details  
SE-101.00 Connectivity and Equipment  
SE-801.00 Details  
SE-802.00 Schedules

**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.

<b>DB</b> Disconnect Circuit Breaker (Switch)	<b>P</b> Pilot Light	<b>BG</b> Break Glass Station
<b>TS</b> Thermal Switch	<b>F</b> Firestat	<b>HOA</b> Hand-Off Auto.
<b>MS</b> Magnetic Starter	<b>T</b> Thermostat	<b>PB</b> Push Button Station
<b>CMS</b> Comb. Mag. Starter	<b>AL</b> Alternator	<b>RO</b> Remote "off"

Equip. Ident.	Location	# of Units	HP or KW	Volts and Phase	Control Type: See legend above	Remarks:
RTU-1	Roof	1	83 MCA 100 MFA	208 V / 3 phase	CMS	
F-1	Roof	1	0.05 HP	115 V / 1 phase	DB	
F-2	Roof	1	0.02 HP	115 V / 1 phase	DB	
EH-1	Bathrooms	3	1.8 KW	120 V / 1 phase	DB	Integral with heater supplied by manufacturer
EH-2	East Entry	1	4.8 KW	208 V / 1 phase	DB	Integral with heater supplied by manufacturer
CP-1	Hallway Ceiling	1	0.080 KW	115 V / 1 phase	DB	

**SCHEDULE E**

**Separation of Trades**

***NOT USED FOR SINGLE CONTRACTS***



















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SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the selective demolition and alteration work as shown on the drawings and/or specified herein, including but not limited to the following:
  - 1. Alterations, selective demolition and removals as noted on drawings and as required to accommodate new construction.
  - 2. Removal of debris.
  - 3. Protection of existing building and spaces to remain, and shoring of the structure as required for structural integrity and personal safety.
  - 4. Protection of existing curbs and sidewalks.
  - 5. Temporary coverage passageways.
  - 6. Alterations, selective demolition and removals of exterior facade where noted.
  - 7. Patching and refinishing of existing surfaces damaged as a result of this work.
  - 8. Protection.

1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions
- B. Rough Carpentry - Section 06 02 00.
- C. Alteration and removal requirements for mechanical and electrical work - Mechanical and Electrical Sections.

#### 1.4 QUALITY ASSURANCE

- A. The Contractor shall comply with the requirements of all applicable Federal, State and local safety and health regulations regarding the demolition of structures including ANSI/NFPD 241-Building Construction and Demolition Operations.
- B. The Contractor shall be responsible for any damage to any adjacent structures or buildings to remain.
- C. Qualifications: Qualifications of Contractor for work of this Section shall not be less than three (3) years of field experience in work of this nature.
- D. Professional Engineering: The Contractor shall retain the services of a Professional Engineer licensed in the State of New York, who shall design and supervise installation of all underpinning and shoring.

#### 1.5 SUBMITTALS

- A. LEED Submittals:
  - 1. LEED BUILDING Submittal Requirements: The contractor and appropriate subcontractors shall comply with the requirements of Section 01 74 19 – Construction Waste Management and shall submit the LEED Building certification items in accordance with Section 01 33 00 Submittals.
  - 2. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Schedule of Demolition Operations: Submit demolition procedures and operational sequence for Commissioner's review prior to start of work. Submit a written request to Commissioner well in advance of executing any cutting or alteration which affects:
  - 1. The work of tying in or connecting to operational systems of the building, including electrical, mechanical and security systems.
  - 2. The work of the City of New York or any separate Contractor.
  - 3. The structural value or integrity of any element of the project or of adjacent structures.
  - 4. The integrity or effectiveness of weather-exposed and moisture-resistant elements or systems.
  - 5. The efficiency, operational life, maintenance, or safety of operational elements or systems.
- C. Notice of Differing Conditions: Submit a written notification if, during the work of demolition and cutting, conditions are discovered which significantly vary from those shown on the drawings. Do not commence work until approval of Commissioner.
- D. Shop Drawings: Submit the following prior to starting work:
  - 1. Submit for Commissioner's information shop drawings indicating location and typical construction details of temporary dustproof and weatherproof partitions.

2. Submit drawings of temporary structural shoring, bracing, framing or support, for the information of the Commissioner. Such drawings will be reviewed by the Structural Engineer for the effects of such temporary members on the structural elements to remain. These drawings shall include the reason for such temporary members, the location, the direction and magnitude of design reaction forces on existing structure, and details showing how these reaction forces will be applied to the existing structure.
  - a. Shop drawings shall be submitted with the Seal of the P.E. engaged by Contractor; P.E. must be licensed in the State of New York.
  - b. The Commissioner will receive acknowledgment for concepts shown. Such acknowledgments shall be of the concept only and not of actual capacities or structural design and shall not in any way diminish or limit the Contractor's responsibility for the quality and performance of the work and for protecting existing structures and facilities.

#### 1.6 SPECIAL PRECAUTION

- A. Hazardous materials may be encountered during demolition operations including asbestos; comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
- B. Refer to Section 02 82 13 for further direction on asbestos abatement.

#### 1.7 JOB CONDITIONS

##### A. Condition of Structure

1. The Contractor for the work of this Section shall be held to have visited the site, examined the premises, determined for himself the existing conditions, character of equipment and facilities needed for the performance of the work, and all matters which may in any way affect the work before submitting a bid.
  - a. Information regarding existing construction or conditions is based on available record drawings which may or may not truly reflect existing conditions. Such information is included on the assumption that it may be of interest to the Contractor, but the Commissioner, City of New York and their consultants do not assume responsibility for its accuracy or completeness.
  - b. Notify the Commissioner if, during the course of demolition, conditions are discovered which significantly vary from those shown on the drawings. Do not proceed until authorized by Commissioner.
2. The Contractor shall accept the condition of the site and structures as found. The Commissioner and City of New York assume no responsibility for condition of site or structures nor the continuation of the condition existing at time of bidding or thereafter.

- B. Areas of building to be demolished or altered will be vacated and discontinued in use prior to the start of the work.

1. Surrounding areas of the building shall remain operational by the City of New York.

##### C. Partial Removal

1. Items of savable value to the Contractor may be removed from the structure as the work progresses. Salvaged items must be transported from the site as they are

removed. See List below for Salvaged Items that are to be retained and stored for reuse.

2. Storage or sale of removed items on the site will not be permitted.

D. Explosives: The use of explosives will not be permitted.

E. Traffic

1. Conduct demolition operations and the removal of debris to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities.
2. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

F. Utilities

1. Refer to Division 22 and 26 of the specifications for special requirements concerning utilities and services.
2. Maintain any existing utilities required to remain; keep in service and protect against damage during demolition operations.
3. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to the governing authorities.
4. Disconnect and seal any abandoned utilities before starting demolition operations. Coordinate all work with local utility companies having jurisdiction.

## 1.8 SCHEDULING

- A. Before commencing any alteration or demolition work, submit for review by the Commissioner, and approval of the City of New York, a schedule showing the commencement, the order, and the completion dates for the various parts of this work.
- B. Before starting any work relating to existing utilities (electrical, sewer, water, heat, gas, fire lines, etc.) that will temporarily discontinue or disrupt service to the structures to remain, notify the Commissioner and the City of New York 7 days in advance and obtain the City of New York's approval in writing before proceeding with this phase of the work.

## PART 2 PRODUCTS

Refer to Part 3 - Execution, for Product Requirements

## PART 3 EXECUTION

### 3.1 PROTECTION

- A. Take full precautions to protect workmen, passersby or any other persons from falling debris and other hazards of demolition operations.

- B. Execute demolition work to insure protection of existing portions of building to remain against damages which might occur from falling debris or other cause. Do not interfere with use of adjacent occupied buildings and areas. Maintain free, safe passage to and from occupied adjacent buildings.
- C. Materials Placement: Do not load structure with weight that will endanger, overload or cause excessive deflection of the existing structure, or that will damage finished surfaces adjacent to and/or supported by the existing structure, except portions being removed.
- D. Construction Operations: Do not employ any construction operation, equipment or vehicles that will endanger, overload or cause excessive deflection of the existing structure, or that will damage finished surfaces adjacent to and/or supported by the existing structure, except portions being removed.
- E. Take precautions to guard against movement, settlement, damage, or collapse of any part of building, sidewalks, adjacent property or street passages; be liable for any such movement, settlement or collapse. If such damage does accidentally occur, Contractor shall repair promptly at no cost to City of New York.
- F. Provide the necessary safeguards to prevent accidents, to avoid all necessary hazards and protect the public, the work and property at all times, including Saturdays, Sundays, and holidays.
- G. Be responsible for any and all damages which may arise or occur to any party whatsoever by reason of the neglect in providing proper lights, guards, barriers, or any other safeguards to prevent damage to property, life and limb.
- H. Make such explorations and probes as are necessary to ascertain any required protective measures before proceeding with demolition and removal. Give particular attention to shoring and bracing requirements so as to prevent any damage to existing construction.
  - 1. Provide interior and exterior shoring, bracing, or support to prevent movement or settlement or collapse of structures to be demolished and adjacent facilities to remain. The Contractor's Professional Engineer shall advise on bracing, shoring, underpinning, or other structural requirements. The Contractor shall bear all responsibility for prevention of movement or other structural fault.
  - 2. The Contractor shall restore, by repair or otherwise, the portions of structure or their contents altered by the Contractor in furtherance of his underpinning and support operations. Restoration shall be completed to the conditions which existed prior to the start of the work. Any damage caused by inadequate support shall also be restored by the Contractor at no cost to the City of New York.
- I. Provide, erect and maintain catch platforms, lights, barriers, weather protection, warning signs, and other items as required for proper protection of the workmen engaged in demolition and alteration operations, occupants of the building, public and adjacent property. Any damage caused by the Contractor's operations shall be promptly repaired by the Contractor at no cost to the City of New York.
- J. Provide and maintain temporary protection of the existing structure designated to remain where demolition, removal, and new work are being done, connections made, materials handled, or equipment moved.

- K. Take necessary precautions to prevent dust and dirt from rising. Protect unaltered portions of the existing building affected by the operations under this Section by dustproof partitions and other adequate means.
- L. Provide adequate fire protection in accordance with local Fire Department requirements.
- M. Do not close or obstruct walkways, passageways, or stairways. Do not store or place materials in passageways, stairs, or other means of egress. Conduct operations with minimum traffic interference.
- N. Be responsible for any damage to the existing structure or contents by reason of the insufficiency of protection provided.
- O. Erect temporary covered passageways at street level as required by authorities having jurisdiction.
- P. Promptly repair damages caused to adjacent facilities by demolition operations at no cost to the City of New York.
- Q. Provide and maintain weather protection at exterior openings so as to fully protect the interior premises against damage from the elements until such openings are closed by new construction.

### 3.2 INSPECTION

- A. Verify that areas of demolition work are protected and temporary dustproof partitions have been installed.
- B. Verify that construction to be removed is not load bearing or has been properly braced, framed or supported.
- C. Inspect existing conditions of the project, including elements subject to damage or to movement during demolition and cutting.
- D. After uncovering work, inspect the conditions affecting the installation or performance of the work.
  - 1. Report differing or questionable conditions to the Commissioner in writing; do not proceed with the work until the Commissioner has provided further instructions.

### 3.3 PREPARATION

- A. Provide adequate temporary support as necessary to assure the structural value or integrity of the affected portion of the work
- B. Provide devices and methods to protect other portions of the project from damage.
- C. Pollution Controls
  - 1. Comply with requirements defined in Section 018113 Sustainable Design Requirements and Section 018119 IAQ Requirements, or item 2. below, whichever is more stringent.
  - 2. Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.

- a. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
3. Clean adjacent structures and improvements of dust, dirt and debris caused by demolition operations. Return adjacent areas to condition existing prior to the start of the work.
4. Provide drainage for temporary water use.

### 3.4 DEMOLITION AND CUTTING

#### A. Selectively demolish existing construction in conformance with the drawings and these specifications.

1. Execute cutting and demolition by methods which will prevent damage to other work and will provide proper surface to receive installation of work by others and patching of finish surfaces.
2. Do all cutting or removal so as to leave neat, true, plumb and square edges, at edges to remain. Use carborundum or diamond saw equipment for cutting masonry, concrete and stone work, where edges or surfaces are to remain.
3. Do not cut or remove construction which might weaken or impair the structural integrity or strength of the structural framing or support systems which are to remain.
4. Demolish and remove materials as shown on the drawings without damage to the remaining parts of the structure or mechanical/electrical/utility systems.
5. Remove materials so as to not impose excessive loads in supporting walls, floors or framing and so as not to damage remaining undemolished portions of the structure.
6. Where portions of structures are to be removed, remaining portions shall be protected from damage and prepared to fit new construction. Damage to portions of structures to remain shall be repaired.
7. Reinforcing steel in existing structures shall be left in place, cleaned and aligned to provide tie with new work.
8. Existing waterproofing systems and flashings shall be carefully exposed and protected to maintain workable conditions of fitting new work with existing construction.
9. Proceed with demolition in a systematic manner.
10. Demolish concrete and masonry in small sections.
11. Remove structural framing members and lower to ground by means of hoists, derricks, or other suitable methods.

#### B. Shoring

1. Design, provide, erect and maintain necessary temporary shoring, bracing, framing, or support where load bearing structural or supporting members are removed or weakened by cuts or openings or are subject to damage from



demolition operations, and otherwise as required for safety or to protect finish surfaces from damage.

2. Construction and adequacy of the shoring shall be the entire responsibility of the Contractor. Any damage caused by the inadequacy of the shoring or other support shall be the responsibility of the Contractor to remedy at no additional expense to the City of New York.
3. Shoring and bracing shall remain until new structural framing and/or supports are installed. Coordinate operations fully with other trades.
4. Be ready at any time to promptly provide, add to, or strengthen temporary shoring, bracing, or support for existing work, in case existing construction begins to show signs of structural stress.

### 3.5 WORKMANSHIP STANDARDS FOR ALTERATION AND REMOVAL WORK

- A. Cut, remove, alter, temporarily remove and replace, or relocate existing work as required for performance of the work. Perform such work required with due care, including shoring and bracing.
- B. Coordinate patching involving the various trades whether or not specifically mentioned in the respective specification Sections.
- C. Materials or items demolished and not designated to become the property of the City of New York or to be reinstalled shall become the property of the Contractor and shall be removed from the City of New York's property.
- D. Execute the work in a careful and orderly manner, with the least possible disturbance to the public and to the occupants of the adjacent buildings.
- E. In general, demolish masonry in small sections. Where necessary to prevent collapse of any construction, install temporary shores, struts, or bracing.
- F. Materials to be removed by existing elevators shall be put in enclosed containers.
- G. Where existing equipment and/or fixtures are indicated to be reused, repair such equipment and/or fixtures and refinish to put in perfect working order. Refinish as directed.
- H. Cut out embedded anchorage and attachment items as required to properly provide for patching and repair of the respective finishes.
- I. Confine cutting of existing roof areas designated to remain to the limits required for the proper installation of the new work. Cut and fold back existing roofing. Cut and remove insulation and related items. Provide temporary weathertight protection as required until new roofing and flashings are installed. Consult the City of New York to ascertain if existing guarantee bonds are in force and execute the work so as not to invalidate such bonds.
- J. Where utilities are removed, relocated or abandoned, cap, valve, plug, or by-pass to make complete and working installation.
- K. Restore existing pipe and duct coverings damaged by work under this Contract to original undamaged condition.

- L. Immediately restore to service and repair any damage caused by Contractor's workmen to existing pipe and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems which are not scheduled for discontinuance or abandonment.
- M. Upon completion of contract, deliver work complete. Damage that may be caused by Contractor or Contractor's workmen to existing structures designated to remain, grounds, and utilities shall be repaired by Contractor and left in as good condition as existed prior to damaging.
- N. Restore finish work of floors, walls, and ceilings remaining in place but damaged or defaced because of demolition or alteration work to condition equal that which existed at beginning of work under this Contract.
- O. Where alteration or removals expose damaged or unfinished surfaces or materials, refinish such surfaces or materials, or remove them and provide new or salvaged materials to make continuous surfaces uniform.
- P. Perform new work and restore and refinish existing work in conformance with applicable requirements of the specifications, except as follows:
  - 1. Materials for use in repair of existing surfaces, but not otherwise specified, shall conform to the highest standards of the trade involved, and be in accordance with approved industry standards, and shall be as required to match existing surfaces.
  - 2. Workmanship for repair of existing materials shall, unless otherwise specified, be equal to similar workmanship existing in or adjacent to the space where the work is being done.
  - 3. Installation of salvaged items where no similar items exist shall be done in accordance with the highest standards of the trade involved and in accordance with approved shop drawings.
- Q. Materials or items designated to become the property of the City of New York shall be as shown on the drawings. Remove such items with care and store them in a location at the site to be designated by the City of New York.
- R. Materials or items designated to be reinstalled shall be as shown on the drawings. Remove such items with care under the supervision of the trade responsible for reinstallation; protect and store until required. Replace materials or items damaged in their removal with similar new material.
- S. The existing building shall not be used as a work shop. Neither shall the furnishings or equipment in any room be used as work benches. Should any damage occur during the progress of the work to any furniture, fixtures, equipment, or appurtenances therein, such damage shall be repaired, replaced or made good by the Contractor without extra cost to the City of New York.
- T. Where removing existing floor finish and base, remove all adhesive and leave floors and walls smooth and flush, ready to receive new finish.
- U. Finish new and adjacent existing surfaces as specified for new work. Clean existing surfaces of dirt, grease and loose paint before refinishing.

### 3.6 DISPOSAL OF DEMOLISHED MATERIALS

#### A. General

1. Remove from the site debris, rubbish and other materials resulting from work of this Section. Comply with Section 017419 Construction Waste Management and Section 018113 Sustainable Design Requierments.
2. Burning of removed materials from demolished structures will not be permitted on the site.

- B. Removal: Transport materials removed from demolished structures and legally dispose of off site. Pay any and all fees associated with disposal work. Leave the site in an orderly condition to the approval of the Commissioner.

### 3.7 SALVAGE OF DEMOLISHED ITEMS

#### A. General

1. Salvage items for reuse, to contractors best ability, all items as follows:
  - a. Flagpole assembly.
  - b. Existing bicycle racks.
  - c. Existing brick veneer at the Main Entry area.
  - d. Existing RFID gates at Main Entry.
  - e. Any exisitng shelving or furniture as noted.
  - f. All exising light fixtures, acoustic ceiling tiles and suspension system, HVAC components, Fire Alarm system components and security system components as noted.
  - g. Existing signage, including pin letters and Queens Library banner.
- B. Salvage items shall be stored in a secure location in preparation for reuse or reclamation by Queens Library.

### 3.8 CLEANING UP

- A. Remove debris as the work progresses. Maintain existing premises in a neat and clean condition.

END OF SECTION

**SECTION 028013 – GENERAL CONTRACTOR WORK**  
**ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT**

**1.01 SCOPE FOR ASBESTOS ABATEMENT WORK**

- A. The "General Conditions" apply to the work of this Section.
- B. The Asbestos abatement contractor shall remove asbestos containing materials as needed to perform the other work of this Contract when discovered during the course of work. When required, the Asbestos abatement contractor shall replace the ACM with non-asbestos containing materials. An allowance of **\$15,000.00** for the **General Contractor** is herein established for this incidental work when so ordered and authorized by the Commissioner.
- C. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE RULES AND REGULATIONS OF THE ASBESTOS CONTROL PROGRAM AS PROMULGATED BY TITLE 15 CHAPTER I OF RCNY AND NEW YORK STATE DEPARTMENT OF LABOR INDUSTRIAL CODE RULE 56 CITED AS 12 NYCRR, PART 56 WHICHEVER IS MORE STRINGENT AS PER LATEST AMENDMENTS TO THESE LAWS AND AS MODIFIED HEREIN BY THESE SPECIFICATIONS.
- D. ALL DISPOSAL OF ASBESTOS CONTAMINATED MATERIAL SHALL BE PER LOCAL LAW 70/85.
- E. THE ASBESTOS ABATEMENT CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT CERTAIN METHODS OF ASBESTOS ABATEMENT ARE PROTECTED BY PATENTS. TO DATE, PATENTS HAVE BEEN ISSUED WITH RESPECT TO "NEGATIVE PRESSURE ENCLOSURE" OR "NEGATIVE-AIR" OR "REDUCED PRESSURE" AND "GLOVE BAG".
- F. THE ASBESTOS ABATEMENT CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND SHALL HOLD THE DEPARTMENT OF DESIGN AND CONSTRUCTION AND THE CITY HARMLESS FROM ANY AND ALL DAMAGES, LOSSES AND EXPENSES RESULTING FROM ANY INFRINGEMENT BY THE ASBESTOS ABATEMENT CONTRACTOR OF ANY PATENT, INCLUDING BUT NOT LIMITED TO THE PATENTS DESCRIBED ABOVE, USED BY THE ASBESTOS ABATEMENT CONTRACTOR DURING PERFORMANCE OF THIS AGREEMENT.
- G. "Asbestos" shall mean any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cumingtonite-grunerite), crocidolite (riebeckite), tremolite, anthrophyllite and actinolite.

GENERAL CONTRACTOR WORK ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT

- 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 Asbestos abatement contractor is responsible to retain a NYSDOL Licensed Design Professional as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required plans.

The Asbestos abatement contractor is responsible for the submission of all required documents to the NYCDEP to acquire the appropriate Asbestos Project Conditional Closeout (ACP-20) and/or Asbestos Project Completion Forms (ACP-21) on a timely basis for the completion of the incidental work encountered under this contract.

The Asbestos abatement contractor will be required to attend an on-site job meeting with the Construction Project Manager prior to the start of work to examine conditions and plan the sequence of operations, etc.

The Asbestos abatement contractor shall have a NYSDOL/NYCDEP Asbestos Supervisor onsite to oversee the work and conduct a final visual inspection as required by both Title 15, Chapter 1 of the RCNY and NYSDOL Industrial Code Rule 56.

- I. All work shall be done during regular working hours unless the Asbestos abatement contractor requests authorization to work in other than regular working hours and such authorization is granted by the Commissioner. (Regular work hours are those hours during which any given facility, in which work is to be done, is customarily open and functioning, normally between the hours of 8:00 A.M. and 4:00 P.M. Monday - Friday.) If such work schedule is authorized by the Commissioner, the work shall be done at no additional cost to the City.

- J. The Commissioner may order that work be done in other than regular working hours as herein by defined and this order may require the Asbestos abatement contractor to pay premium or overtime wages to complete the work. If the Commissioner orders work in other than regular working hours, the Asbestos abatement contractor shall multiply the unit price for that portion of the work requiring premium wages by 1.50 when computing payment in accordance with Paragraph 1.09. All requests for premium payment must be supported by certified payroll sheets and field sheets approved by the Construction Project Manager.

**1.02 QUALIFICATIONS OF ASBESTOS ABATEMENT CONTRACTOR**

- A. Requirements: The asbestos abatement contractor must demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (5) below. The asbestos abatement contractor must, submit documentation demonstrating compliance with all listed requirements. Such documentation shall include without limitation, all required licenses, certificates, and documentation.
1. The asbestos abatement contractor must, whether an individual, corporation, partnership, joint venture or other legal entity, must demonstrate for the three year period prior to the work, that it has been licensed by the New York State Department of Labor, as an "Asbestos abatement contractor".
  2. The asbestos abatement contractor must, for the three year period prior to the work, have been in the business of providing asbestos abatement services as a routine part of its daily operations.
  3. The asbestos abatement contractor proposing to do asbestos abatement work must be thoroughly experienced in such work and must provide evidence of having successfully performed and completed in a timely fashion at least five (5) asbestos abatement projects of similar size and complexity. The aggregate cost of these projects must be at least \$250,000.00 in each of the three years.
  4. For each project submitted to meet the experience requirements set forth above, the asbestos abatement contractor must submit the following information for the project; name and location of the project; name title and telephone number of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work, brief description of the work completed as a prime or sub-asbestos abatement contractor; amount of contract or subcontract and the date of completion.
  5. The asbestos abatement contractor must demonstrate that it has the financial resources, supervisory personnel and equipment necessary to carry out the work and to comply with the required performance schedule, taking into consideration other business commitments. The asbestos

abatement contractor must submit such documentation as may be required by the Department of Design and Construction to demonstrate that it has the requisite capacity to perform the required services of this contract.

- B. Insurance Requirements: The asbestos abatement contractor must provide asbestos liability insurance in the following amount: 1 million dollars per occurrence, 2 million dollars aggregate (combined single limit). The City of New York shall be named as an additional insured on such insurance policy.
- C. 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.

**1.03 ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITIES**

The Asbestos abatement contractor will visit the subject location within one (1) working day of notification to ascertain actual work required. If the project is identified as being "urgent", then work shall commence no later than 48 hours from the time of notification. In this event, the asbestos abatement contractor shall immediately notify when applicable EPA NESHAPS Coordinator, NYSDOL Asbestos Control Bureau and NYCDEP Asbestos Control Program of start of the work and file the necessary Asbestos Notifications and any applicable Variance Applications with the regulatory agencies cited above..

In the event that the project is not classified as "urgent" the Asbestos abatement contractor shall notify the EPA NESHAPS Coordinator, NYSDOL and NYCDEP by submitting the requisite asbestos project notification forms, postmarked 10 days before activity begins if 260 linear feet or more and/or 160 square feet or more of asbestos containing material will be disturbed.

The following information must be included in the notification:

- A. Name and address of building City or operator;
- B. Project description:
  - 1. Size - square feet, number of linear feet, etc;
  - 2. Age - date of construction and renovations (if known);
  - 3. Use - i.e., office, school, industrial, etc.
  - 4. Scope - repair, demolition, cleaning, etc.
- C. Amount of asbestos involved in work and an explanation of techniques used to determine the amount;

- D. Building location/address, including Block and Lot numbers;
- E. Work schedule including the starting and completion dates;
- F. Abatement methods to be employed;
- G. Procedures for removal of asbestos-containing material;
- H. Name, title and authority of governmental representative sponsoring project.

**1.04 WORK INCLUDED IN UNIT PRICE**

The Asbestos abatement contractor will be paid a basic unit price of **\$25.00** per square feet for the removal and disposal of asbestos containing material and replacement of the same with non-asbestos containing materials.

Unit price shall include all costs necessary to do the work of this Contract, including but not limited to: labor, materials, equipment, utilities, disposal, insurance, overhead and profit.

**1.05 AIR MONITORING – ASBESTOS ABATEMENT CONTRACTOR**

- A. "Air Sampling" shall mean the process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method 7400 or the provisional transmission electron microscopy methods developed by the USEPA and/or National Institute of Standard and Technology which are utilized for lower detectability and specific fiber identification.
- B. Air monitoring of Asbestos abatement contractor's personnel will be performed in conformance with OSHA requirements, (All costs associated with this work are deemed included in the unit price.).
- C. Qualifications of Testing Laboratory:

The industrial hygiene laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory identification number shall be submitted and approved by the City. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).

Note: Work area air testing and analysis before, during and upon completion of work (clearance testing) will be performed by a Third Party Air Monitor under separate Contract with the City.



**1.06 THIRD PARTY MONITORING AND LABORATORY**

- A. The NYCDDC, at its own expense, will employ the services of an independent Third Party Air Monitoring Firm and Laboratory. The Third Party Air Monitor will perform air sampling activities and project monitoring at the Work Site.
- B. The Laboratory will perform analysis of air samples utilizing Phase Contrast Microscopy (PCM) and/or Transmission Electron Microscopy (TEM).
- C. The Third Party Air Monitoring Firm and the designated Project Monitor shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the Asbestos abatement contractor to verify that said performance complies with this Specification. The Third-Party Air Monitor shall be on site throughout the entire abatement operation.
- D. The NYCDDC will be responsible for costs incurred with the Third Party Air Monitoring Firm and laboratory work. Any subsequent additional testing required due to limits exceeded during initial testing shall be paid for by the Asbestos abatement contractor.

**1.07 PAYMENT REQUEST DOCUMENTATION**

- B. The following information shall be included for each payment request:
  - 1. Description of work performed.
  - 2. Linear footage and pipe sizes involved.
  - 3. Square footage for boiler & breaching insulation removed.
  - 4. Square footage of non pipe and boiler areas removed, patched, enclosed, sealed, or painted.
  - 5. Square footage of encapsulation, sealing, patching, and painting involved.
  - 6. Total cost associated with compliance with the assigned task.
  - 7. Architectural, Electrical, HVAC, Plumbing, etc. work incidental to the Asbestos Abatement Work.
  - 8. A certified copy (in form 4312-39) to the Comptroller or Financial Officer of the New York City to the effect that the financial statement is true.
  - 9. A signed copy (in form 6506q-6) of certificate of compliance with non-discriminatory provisions of the Contract.

- 10. Attach a copy of valid workmen compensation insurance.
  - 11. Valid asbestos insurance per occurrence.
  - 12. General liability insurance when required.
- C. Each payment request shall include a grand total for all work completed that billing period, the landfill waste manifests and a copy of waste transporter permit. The Department of Design and Construction will inspect the work performed, review the cost and approve or disapprove requests for payment.
- D. EXPOSURE LOG: With this final payment, the Asbestos abatement contractor shall submit a listing of the names and social security numbers of all employees actively engaged in the abatement work of this Contract. This list shall include a summary showing each part of the abatement work in which the employee was engaged and the dates thereof.

**1.08 QUANTITY CALCULATIONS**

In order to determine the square footage involved for the various pipe sizes of pipe insulation that might be encountered, the following table is to be used.

<u>PIPE INSULATION SIZE O.D.</u>	<u>PIPE SIZE O.D.</u>	<u>SQUARE FOOTAGE PER LINEAR FOOT</u>
2-1/2"	1/2"	0.65
2-3/4"	3/4"	0.72
3"	1"	0.79
3-1/4"	1-1/4"	0.85
3-1/2"	1-1/2"	0.92
4"	2"	1.05
4-1/2"	2-1/2"	1.18
5"	3"	1.31
6"	3-1/4"	1.57
7"	3-1/2"	1.83
8"	4"	2.09
9"	5"	2.36
10"	6"	2.62
12"	8"	3.14
14"	10"	3.67
16"	12"	4.19
18"	14"	4.71

**1.09 METHOD OF PAYMENT**

Payment shall be made in accordance with Items A through R below. Payment shall be calculated based on the actual quantity of the item performed by the asbestos abatement

GENERAL CONTRACTOR WORK ALLOWANCE FOR INCIDENTAL 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 1.09, multiplied by the unit price in Section 1.05.

EXAMPLE: 100 lin.ft. of 1/2" pipe and 100 lin.ft. of 6" pipe, including elbows, tees. Flanges, etc.

$$100 \times 0.65 = 65 \text{ sq.ft.} \quad 65 \times \text{unit price} = \text{Payment}$$

$$100 \times 2.62 = 262 \text{ sq.ft.} \quad 262 \times \text{unit price} = \text{Payment}$$

- 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)

$$1000 \text{ S.F.} \times (1.5) \times \text{the Unit Price} = \text{Payment}$$

- 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.

GENERAL CONTRACTOR WORK ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT

- 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. Material Safety Data Sheets (MSDS) for encapsulants, sealants, firestopping foam, cleaners/disinfectants, spray adhesive and any and all potentially hazardous materials that may be employed on the project. No work involving the aforementioned will be allowed to proceed until MSDS are reviewed.
- g. Worker Training and Medical Surveillance: The Asbestos abatement contractor shall submit a list of the persons who will be employed by him /her to perform the removal work. Present evidence that workers have received proper training required by the regulations and the medical examinations required by OSHA 29 CFR 1926.1101.
- h. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.
  - (1) The Asbestos abatement contractor shall provide a permanently bound log book of minimum 8-1/2" x 11" size at the entrance to the Worker and Waste Decontamination enclosure system as hereinafter specified. Log book shall contain on title page the project name, name, address and phone number of the Asbestos abatement contractor; name, address and phone number of Asbestos abatement contractor and City's third party air monitoring firm; emergency numbers including, but not limited to local Fire/Rescue Department. Log book shall contain a list of personnel approved for entry into the Work Area.
  - (2) All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted. Any significant events occurring during the abatement project shall be entered into the log. Upon completion of the job, the Asbestos abatement contractor shall submit the logbook containing a day-to-day record of personnel log entries countersigned by the Construction Project Manager every day.
- i. Worker's Acknowledgments: Submit statements signed by each employee that the employee has received training in the proper handling of ACM, understands the health implications and risks

involved; and understands the use and limitations of the respiratory equipment to be used.

B. During Construction Submittals:

1. Security and safety logs showing names of person entering workspace, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.
2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted daily to the Construction Project Manager.
3. Floor plans indicating Asbestos abatement contractor's current work progress shall be submitted for review by the Construction Project Manager.
4. All Asbestos abatement contractors' air monitoring and inspection results.

C. Project Closeout Submittals:

Upon completion of the project and as a condition of acceptance, the Asbestos abatement contractor shall present two copies of the following items, bound and indexed:

1. Lien Waivers from Asbestos abatement contractor, Sub-Asbestos abatement contractors and Suppliers,
2. Daily OSHA air monitoring results,
3. All Waste Manifests (Asbestos and Construction Debris), seals and disposal logs,
4. Field Sign-In/Sign-Out Logs for every shift,
5. Copies of all Building Department Forms and Permits,
6. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations,
7. All Warranties as stated in the Specifications,
  - a. Fully executed disposal certificates and transportation manifest.
8. Project Record: The Asbestos abatement contractor shall maintain a project record for all small and large asbestos projects. During the project, the



project record shall be kept on site at all times. Upon completion of the project, the project record shall be maintained by the building owner. The project record shall be submitted to DDC as part of the close out documents. The project record shall consist of:

- a. Copies of licenses of all asbestos abatement contractors involved in the project;
- b. Copies of NYCDEP and NYSDOL supervisor and handler certificates for all workers engaged in the project;
- c. Copies of all project notifications and reports filed with NYCDEP, NYSDOL and USEPA for the project, with any amendments or variances;
- d. Copies of all asbestos abatement permits, including associated approved plans and work place safety plan;
- e. A copy of the air sampling log and all air sampling results;
- f. A copy of the abatement asbestos abatement contractor's daily log book;
- g. Copies of all asbestos waste manifests;
- h. A copy of all Project Monitor's Reports (ACP-15).
- i. A copy of each ATR-1 Form completed for the asbestos project (if required).
- j. A copy of each Asbestos Project Conditional Closeout Report (ACP-20) if required.
- k. A copy of the Asbestos Project Completion Form (ACP-21).

### **1.13 PROTECTION OF FURNITURE AND EQUIPMENT**

Cover all furniture and equipment that cannot be removed from Work Areas. Movable furniture and equipment will be removed from Work Areas by the Asbestos abatement contractor prior to start of work. At the conclusion of the work (after final air testing), the Asbestos abatement contractor will remove all plastic covering on walls, floors, furniture, equipment and reinstall furniture and equipment. He shall remove and store all sheaths, curtains and drapes, and reinstall same following final clean up.

**1.14 UTILITIES**

A. General:

All temporary facilities shall be subject to the approval of the Commissioner. Prior to starting work at any site, locations and/or sketches (if required) of temporary facilities must be submitted to the Construction Project Manager for the required approval.

B. Water:

The Department of Design and Construction will furnish all water needed for construction, at no cost to the Asbestos abatement contractor in buildings under their jurisdiction. However, it is the responsibility of the Asbestos abatement contractor to ensure that hot water is provided for showering in the decontamination unit. The Asbestos abatement contractor shall furnish, install and maintain any needed equipment to meet these requirements at his own expense.

C. Electricity:

The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the Asbestos abatement contractor in a building, under their jurisdiction. The Asbestos abatement contractor is responsible for routing the electric power to the abatement Work Area.

All temporary lighting and temporary electrical service for Work Area shall be in weatherproof enclosures and be ground fault protected.

D. In leased spaces, arrangements for water supplies and electricity must be made with the landlord. However, all such arrangements must be made through and are subject to approval of the Department of Design and Construction. Utilities will be provided at no cost to the Asbestos abatement contractor. However, it is the Asbestos abatement contractor's (or the General contractor's) responsibility to furnish and install a suitable distribution system to the Work Area. This system will be provided at no cost to the City.

**1.15 FEES**

The Asbestos abatement contractor shall be responsible for any and all fees or charges imposed by Local, State or Federal Law, Rule and Regulation applicable to the work specified herein, including fees or charges which may be imposed subsequent to the date of the Bid opening.

**END OF SECTION**

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## SECTION 028213

### ASBESTOS ABATEMENT

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. The Contract Documents are as defined in the “Agreement”. The General Conditions shall apply to all Work of this Section.
- B. Work specified herein shall be the removal and disposal of Asbestos-Containing Materials (ACM) and asbestos-contaminated materials from designated areas of the East Elmhurst Community Library, 95-08 Astoria Blvd, Queens, New York, 11369.
- C. The following documents were reviewed and utilized to generate this abatement design specification which serves to locate and quantify the amount of ACM, and asbestos contaminated material, to be abated in support of this project.
  - 1. Set of drawings titled “East Elmhurst Community Library - Expansion” (100% Construction Documents), dated 06/18/13, prepared by Garrison Architects;
  - 2. Asbestos Survey Reports performed by LiRo Engineers, Inc. dated 10/02/13.
- D. The phasing and scheduling of work for this project shall be coordinated with and approved by the Construction Project Manager and Facility Manager. The Construction Project Manager and Facility Manager will make the final determination on all issues under this Contract covered by this Specification.

##### 1.02 SCOPE OF WORK

- A. The asbestos abatement contractor is to provide all labor, materials, equipment, services, testing, appurtenances, permits and agreements necessary to perform the work required for the abatement of ACM as required by these contract documents. All work shall be performed in accordance with this Specification, EPA regulations, OSHA regulations, New York City Local Law 70, Title 15, Chapter 1 RCNY, New York State Industrial Code 56, NIOSH recommendations, and any other applicable federal, state or local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.
- B. The intent of this Specification section is to ensure that the asbestos abatement contractor is responsible for the following:
  - 1. Abatement of all ACM.

## ASBESTOS ABATEMENT

2. Cleaning and decontamination of the entire affected area.
  3. Demolition that may be required to access ACM in each area, Asbestos abatement contractor shall dispose of all debris associated with demolition activities as ACM waste.
  4. Removal and disposal of all ACM found within these areas such as duct vibration cloth, roof membrane, roof flashing material, etc.
  5. Provide all scaffolding, platform installation, equipment, tools, transportation and any other equipment required and/or necessary to complete all work described in the Contract Documents.
  6. The Asbestos abatement contractor shall be responsible for and shall include any and all fees or charges imposed by Local, State or Federal Law, Rule or Regulation applicable to the work specified herein, including fees or charges which may be imposed subsequent to the work.
  7. Prior to destructive demolition activities, the DDC may elect to collect bulk samples of assumed asbestos-containing materials and analyze the bulk samples for asbestos content.
- C. The Asbestos abatement contractor shall perform the following work as described below and indicated on the drawings. The drawings are only a diagrammatic representation of the Work Areas and do not constitute the actual quantities of material. Asbestos abatement contractor is responsible for the confirmation of the actual total quantities of the Work.
1. **Drawing H-002: Ground Floor Plan**
    - a. Remove and dispose of asbestos-containing joint insulation to fiberglass pipe insulation within **Work Area 1**. Asbestos containing joint insulation to fiberglass pipe insulation shall be removed utilizing NYCDEP Title 15, Chapter 1, § 1-106 and § 1-105, Tent and Glove Bag Containment Procedures.
    - b. Remove and dispose of asbestos-containing rug mastic material within **Work Area 2**. Asbestos-containing rug mastic materials shall be removed utilizing NYCDEP Title 15, Chapter 1 § 1-108 Foam Procedure for Flooring/Associated Mastic Removal.

**ASBESTOS ABATEMENT**

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
1	NYCDEP Section § 1-106 and § 1-105 Tent and Glove Bag Containment Procedures	-	50 Ln Ft. of Joint Insulation to Fiberglass Pipe Insulation
2	NYCDEP Section § 1-108 Foam/Viscous Liquid Use in Flooring Removal	150 Sq. Ft. of Rug Mastic	-

- D. The facility is under the jurisdiction of the New York City Public Library. The asbestos abatement contractor shall perform the work of this contract in a manner that will be least disruptive to the normal use of the building.
- E. Asbestos abatement contractor's attention is directed to the fact that patents cover certain methods of asbestos abatement indicated in the specifications. To date, patents have been issued with regard to negative pressure enclosures or negative or reduced pressure and glove-bag.
- F. Asbestos abatement contractor shall be solely responsible for and shall hold the City of New York Department of Design and Construction and the City harmless from, any and all damages, losses and expenses resulting from any infringement by Asbestos abatement contractor of any patent, including but not limited to the patents described above, used by Asbestos abatement contractor during performance of this agreement.
- G. Prior to starting, the asbestos abatement contractor must notify the Commissioner of the City of New York Department of Design and Construction if he anticipates any difficulty in performing the work as directed and required by these Specifications. Asbestos abatement contractor shall be required to attend an on-site job meeting with the Construction Project Manager prior to start of work to examine conditions of the site for removal and plan the sequence for removal operations.
- H. The asbestos abatement contractor shall retain a certified Project Designer for the preparation of an Asbestos Variance Application (ACP-9), if required.
- I. The asbestos abatement contractor shall be responsible for preparing and submitting all filings, notifications, amendments and variances, etc. required by all City, State and Federal regulatory agencies having jurisdiction, at no additional cost to the NYC DDC.

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- J. The general contractor shall retain a Registered Design Professional (person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York) to prepare a Work Place Safety Plan (WSP), if required.
- K. The general contractor shall retain a Registered Design Professional (person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York) to perform final inspections required pursuant to Title 28 of the Administrative Code, including but not limited to special inspections required under Chapter 17 of the Building Code. Such special inspections and A-TR1 forms shall be completed by the Registered Design professional.
- L. For coordination with other Asbestos abatement contractors, see the General Conditions governing all Contracts.
- M. Related Asbestos Removal Work Under Other Contracts:
  - 1. Each asbestos abatement contractor shall be responsible for the removal of incidental asbestos not identified in this section and found prior to or during the Work.
  - 2. Incidental asbestos is defined as ACM that is discovered during the course of their work that must be abated to enable them to perform the work of their Contract.
- N. Work Hours:
  - 1. The asbestos abatement contractor shall establish his work schedule in a way that avoids interference or conflict with the normal functioning of the facility. Work in the evenings shall be done at no additional cost to the City.
  - 2. All work shall be done during regular working hours unless the Asbestos abatement contractor requests authorization to work other than regular working hours and such authorization is granted by the Commissioner (Regular working hours are those during which any given facility in which work is to be done is customarily open and functioning). If such work schedule is authorized by the Commissioner the work shall be done at no additional cost to the City.
  - 3. The order of phases and start dates associated with each will be determined by the Construction Project Manager.
  - 4. Asbestos abatement contractor shall be required to schedule waste transfer during evening hours, when activity within the facility is at a minimum. Evening hours are defined as 6:00 p.m. to 6:00 a.m. Waste transfer must be approved by the Construction Project Manager and Facility Manager.

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- O. The following conditions shall apply to all temporary shutdowns of existing services:
1. All temporary lighting and temporary electrical services for use in the Work Area shall be in weather proof enclosures and be ground fault protected and:
  2. Shall be performed at no additional charge to the City.
  3. Shall be performed at times not interfering with the other activities in the building.
  4. Shall be performed only with written consent from the Commissioner and the Facility Manager.
  5. Shall be made through written request to the Commissioner at least 10 days in advance with complete written description of the work to be performed.
- P. Stages of Asbestos Removal Work:
- a. The asbestos abatement contractor will be required to perform the work and it is the intent of this Specification to remove all asbestos containing and asbestos contaminated materials from the Work Area. The asbestos abatement contractor is responsible for verifying all quantities of materials listed.
- Q. Certain equipment in the Work Area may need to remain operational during removal. Therefore, the removal of ACM from this equipment shall be performed as the last removal activities within the Work Area. The Asbestos abatement contractor shall coordinate the scheduling for the removal of ACM on functioning equipment with the Construction Project Manager.

### 1.03 QUALIFICATIONS OF ASBESTOS ABATEMENT CONTRACTOR

- A. Requirements: The asbestos abatement contractor must demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (5) below. The asbestos abatement contractor must submit documentation demonstrating compliance with all listed requirements. Such documentation shall include without limitation, all required licenses, certificates, and documentation.
1. The asbestos abatement contractor must, whether an individual, corporation, partnership, joint venture or other legal entity, demonstrate for the three year period prior to the work, that it has been licensed by the New York State Department of Labor, as an "Asbestos Abatement Contractor".



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2. The asbestos abatement contractor must, for the three year period prior to the work, have been in the business of providing asbestos abatement services as a routine part of its daily operations.
  3. The asbestos abatement contractor proposing to do asbestos abatement work must be thoroughly experienced in such work and must provide evidence of having successfully performed and completed in a timely fashion at least five (5) asbestos abatement projects of similar size and complexity. The aggregate cost of these projects must be at least \$1,000,000 in each of the three years.
  4. For each project submitted to meet the experience requirements set forth above, the asbestos abatement contractor must submit the following information for the project; name and location of the project; name title and telephone number of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work; brief description of the work completed as a prime or sub-asbestos abatement contractor; amount of contract or subcontract and the date of completion.
  5. The asbestos abatement contractor must demonstrate that it has the financial resources, supervisory personnel and equipment necessary to carry out the work and to comply with the required performance schedule, taking into consideration other business commitments. The asbestos abatement contractor must submit such documentation as may be required by the Department of Design and Construction to demonstrate that it has the requisite capacity to perform the required services of this contract.
- B. Throughout the specifications, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics thereof. Provide materials or workmanship that meet or exceed the specifically named codes or standards where required by these specifications.
- C. Site Investigation: Asbestos abatement contractor shall inspect all the specifications and related drawings, and will investigate and confirm the site conditions affecting the work, including, but not limited to:
1. Physical considerations and conditions of both the material and structure. These considerations include any obstacles or obstructions encountered in accessing or removing the material.
  2. Handling, storage, transportation and disposal of the material.
  3. Availability of qualified and skilled labor.
  4. Availability of utilities.

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5. Exact quantities of all materials to be disturbed and/or removed.

### 1.04 WORK BY OTHERS

The City reserves the right during the term of this Contract to have work performed on asbestos abatement projects by other asbestos abatement contractors as the situation warrants.

### 1.05 DEFINITIONS

- A. General Explanation: Certain terms used in this Specification Section are defined below. Definitions and explanations of this Specification Section are not necessarily complete or exclusive, but are general for the Work to the extent they are not stated more explicitly in another element of the Contract Documents.
- B. Definitions in General Use:
  1. Approve: Where used in conjunction with Engineer's response to submittals, requests, applications, inquiries, reports and claims by Asbestos abatement contractor, the meaning of term "approved" will be held to limitations of Engineer's responsibilities and duties as specified in Contract Documents. In no case will "approval" by Engineer be interpreted as a release of Asbestos abatement contractor from responsibilities to fulfill requirements of Contract Documents.
  2. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Engineer," "requested by Engineer," and similar phrases. However, no such implied meaning will be interpreted to extend Engineer's responsibility into Asbestos abatement contractor's responsibility for construction supervision.
  3. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
  4. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on Drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.

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5. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at Project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
6. Installer: The term "installer" is defined as the entity (person or firm) engaged by the asbestos abatement contractor, or its sub-asbestos abatement contractor for performance of a particular unit of work at Project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to perform.
7. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
8. Third-Party Air Monitor: The term "Third-Party Air Monitor" is defined as an entity engaged by City and Construction Project Manager to perform specific inspections or tests of the work, either at Project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.

### C. Definitions Relative to Asbestos Abatement:

1. Abatement: Any and all procedures physically taken to control fiber release from asbestos-containing materials. This includes removal, encapsulation, enclosure, cleanup and repair.
2. Adequately Wet: The complete penetration of a material with amended water to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material, then the material has not been adequately wetted. However, the absence of visible emissions is not evidence of being adequately wet. ACM must be fully penetrated with the wetting agent in order to be considered adequately wet. If the ACM being abated is resistant to amended water penetration, wetting agent shall be applied to the material prior to and during removal as necessary to minimize fiber release.
3. Aggressive Sampling: Method of sampling in which the individual collecting the air sample creates activity by the use of mechanical equipment during the sampling period to stir up settled dust and simulate activity in that area of the building.
4. AHERA: Asbestos Hazard Emergency Response Act of 1986
5. AIHA: American Industrial Hygiene Association.

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6. **Airlock:** System for permitting entrance and exit while restricting air movement between a contaminated area and an uncontaminated area. It consists of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.
7. **Air Sampling:** Process of measuring the fiber content of a known volume of air collected during a specific period. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method 7400, or the provisional transmission electron microscopy methods developed by the US EPA which is utilized for lower detection levels and specific fiber identification.
8. **Ambient Air Monitoring:** "Ambient air monitoring" shall mean measurement or determination of airborne asbestos fiber concentrations outside but in the general vicinity of the worksite.
9. **Amended Water:** Water to which a surfactant has been added.
10. **ANSI:** American National Standards Institute
11. **Area Air Sampling:** Any form of air sampling or monitoring where the sampling device is placed at some stationary location.
12. **Asbestos:** Any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cumingtonite-grunerite), crocidolite (riebeckite), tremolite, anthophyllite and actinolite.
13. **Asbestos-Containing Material (ACM):** Asbestos or any material containing more than one-percent asbestos.
14. **Asbestos-Containing Waste Material:** ACM, asbestos-contaminated objects or debris associated with asbestos abatement requiring disposal.
15. **Asbestos-Contaminated Objects:** Any objects which have been contaminated by asbestos or asbestos-containing material.
16. **Asbestos Assessment Report:** "Asbestos Assessment Report" shall mean the "Form ACP-5" form, as approved by NYCDEP, by which a NYCDEP-certified asbestos investigator certifies that a building or structure (or portion thereof) is free of ACM or the amount of ACM to be abated constitutes a minor project.

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17. **Asbestos Handler:** Individual who disturbs, removes, repairs, or encloses asbestos material. This individual shall have completed approved training course(s) and be in possession of certification issued by NYCDEP and NYSDOL.
18. **Asbestos Handler Supervisor:** Individual who supervises the handlers during an asbestos project and ensures that proper asbestos abatement procedures as well as individual safety procedures are being adhered to. This individual shall have completed approved training course(s) and be in possession of certification issued by NYCDEP and NYSDOL.
19. **Asbestos Investigator:** An individual certified by NYCDEP as having successfully demonstrated his or her ability to identify the presence of and evaluate the condition of asbestos in a building or structure.
20. **Asbestos Project:** Any form of work performed in a building or structure which will disturb (e.g., remove, enclose, encapsulate) more than 25 linear feet or more than 10 square feet of asbestos-containing material.
21. **ASTM:** American Society for Testing and Materials.
22. **Asbestos Project Notification:** The "Form ACP-7" asbestos project notification form as approved by DEP.
23. **Authorized Visitor:** Authorized visitor shall mean the building owner and his/her representative, and any representative of a regulatory or other agency having jurisdiction over the project.
24. **Building Owner:** Person in whom legal title to the premises is vested unless the premises are held in land trust, in which instance Building Owner means the person in whom beneficial title is vested.
25. **Building Materials:** Any and all manmade materials, including but not limited to interior and exterior finishes, equipment, bricks, mortar, concrete, plaster, roofing, flooring, caulking, sealants, tiles, insulation, and outdoor paving such as sidewalks, paving tiles and asphalt.
26. **Certified Industrial Hygienist (CIH):** Individual with a minimum of five years experience as an industrial hygienist and who has successfully completed both levels of the examination administered by the American Board of Industrial Hygiene and who is currently certified by that board.
27. **Certified Safety Professional (CSP):** Individual having a bachelor's degree from an accredited college or university and a minimum of four years experience as a safety professional and who has successfully completed both levels of the examination administered by the Board of Certified Safety Professionals and who is currently certified by that board.

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28. Chain of Custody: "Chain of Custody" shall mean the form or set of forms that document the collection and transfer of a sample.
29. City: City of New York
30. Clean Room: An uncontaminated area or room that is part of worker decontamination enclosure system with provisions for storage of workers' street clothes and protective equipment.
31. Clearance Air Monitoring: Employment of aggressive sampling techniques with a volume of air collected to determine the airborne concentration of residual fibers and shall be performed as the final abatement activity.
32. Commissioner: shall mean the head of the Agency that has entered into this contract or his/her duly authorized representative.
33. Competent Person: Shall mean the designated person as defined by OSHA in 29 CFR1926.1101.
34. Curtained Doorway: Device that consists of at least three overlapping sheets of fire retardant plastic over an existing or temporarily framed doorway. One sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and left side. All sheets shall have weights attached to the bottom to ensure that the sheets hang straight and maintain a seal over the doorway when not in use.
35. Decontamination Enclosure System: Series of connected rooms, separated from the Work Area and from each other by air locks, for the decontamination of workers, materials, waste containers, and equipment.
36. Demolition: The dismantling or razing of a building, including all operations incidental thereto (except for asbestos abatement activities), for which a demolition permit from the New York City Department of Buildings is required.
37. NYCDEP or DEP: The New York City Department of Environmental Protection.
38. Disturb: Any action taken which may alter, change, or stir, such as but not limited to the removal, encapsulation, enclosure or repair of asbestos-containing material.
39. DOB: The New York City Department of Buildings.

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40. Egress: A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.
41. ELAP: Environmental Laboratory Approval Program administered by the New York State Department of Health.
42. Encapsulant (sealant) or Encapsulating Agent: Liquid material which can be applied to ACM and which temporarily controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.
43. Encapsulation: The coating or spraying of asbestos-containing material encapsulant. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.
44. Enclosure: Construction of airtight walls and/or ceilings between ACM and the facility environment, or around surfaces coated with ACM, or any other appropriate procedure as determined by the NYCDEP which prevents the release of asbestos fibers.
45. EPA or USEPA: United States Environmental Protection Agency.
46. Equipment Room: Contaminated area or room that is part of the worker decontamination enclosure system with provisions for the storage of contaminated clothing and equipment.
47. Exit: That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction to provide a protected path of egress travel between the exit access and the exit discharge.
48. FDNY: The Fire Department of the City of New York.

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49. Fiber: An acicular single crystal or a similarity elongated polycrystalline aggregate which displays some resemblance to organic fibers by having such properties as flexibility, high aspect ratio, silky luster, axial lineation, and others, and which has attained its shape primarily through growth rather than cleavage.
50. Fixed Object: A unit of equipment, furniture, or other item in the work area which cannot be removed from the work area. Fixed objects shall include equipment, furniture, or other items that are attached, in whole or in part, to a floor, ceiling, wall, or other building structure or system or to another fixed object and cannot be reasonably removed from the work area. Fixed objects shall also include pipes and other equipment inside the work area which are not the subject of the asbestos project. Active fire suppression system components shall not be considered fixed objects.
51. Glovebag technique: shall mean a method for removing asbestos-containing material from heating, ventilation and air conditioning (HVAC) ducts, short piping runs, valves, joints, elbows, and other nonplanar surfaces. The glovebag assembly is a manufactured device consisting of a large bag (constructed of at least 6-mil transparent plastic), two inward-projecting long sleeve gloves, one inward-projecting waterwand sleeve, an internal tool pouch, and an attached, labeled receptacle for asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains all asbestos fibers released during the removal process.
52. HEPA-Filter: High efficiency particulate air filter capable of trapping and retaining 99.97 percent of particles (asbestos fibers) greater than 0.3 micrometers mass median aerodynamic equivalent diameter.
53. HEPA vacuum equipment: "HEPA vacuum equipment" shall mean vacuuming equipment with a HEPA filter.
54. Holding Area: Chamber in the equipment decontamination enclosure located between the washroom and an uncontaminated area.
55. Homogeneous Work Area: Portion of the Work Area that contains one type of ACM and/or where one type of abatement is used.
56. Industrial Hygiene: Science and art devoted to the recognition, evaluation, and control of those environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well being, or significant discomfort and inefficiency among worker or among the citizens of the community.



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57. Industrial Hygienist: Individual having a college or university degree or degrees in Engineering, Chemistry, Physics or Medicine, or related Biological Sciences who, by virtue of special studies and training, has acquired competence in industrial hygiene. Such special studies and training must have been sufficient in all of the above cognate sciences to provide the abilities:
  - a. To recognize the environmental factors and to understand their effect on people and their well being; and
  - b. To evaluate, on the basis of experience and with the aid of quantitative measurement techniques, the magnitude of these stresses in terms of ability to impair people's health and well being; and
  - c. To prescribe methods to eliminate, control, or reduce such stresses when necessary to alleviate their efforts.
58. Isolation Barrier: The construction of partitions, the placement of solid materials, and the plasticizing of apertures to seal off the work place from surrounding areas and to contain asbestos fibers in the work area.
59. Large Asbestos Project: Asbestos project involving the disturbances (e.g., removal, enclosure, encapsulation) of 260 linear feet or more of ACM or 160 square feet or more of ACM.
60. Log: An official record of all activities that occurred during the project. At a minimum, the log shall identify the building owner, agent, asbestos abatement contractor, and workers, and other pertinent information including daily activities, cleanings and waste transfers, names and certificate numbers of asbestos handler supervisors and asbestos handlers; results of inspections of decontamination systems, barriers, and negative pressure ventilation equipment; summary of corrective actions and repairs; work stoppages with reason for stoppage; manometer readings at least twice per work shift; daily checks of emergency and fire exits and any unusual events.
61. Minor Project: A project involving the disturbance (e.g., removal, enclosure, encapsulation, repair) of 25 linear feet or less of asbestos containing material or 10 square feet or less of asbestos containing material.
62. Movable Object: Unit of equipment or furniture in the Work Area that can be removed from the Work Area.
63. Negative Air Pressure Equipment: Portable local exhaust system equipped with HEPA filtration. The system shall be capable of creating a negative pressure differential between the outside and inside of the Work Area.

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64. NESHAPS: National Emission Standards for Hazardous Air Pollutants.
65. NFPA: The National Fire Protection Association.
66. NIOSH: National Institute for Occupational Safety and Health.
67. DEP or NYCDEP: New York City Department of Environmental Protection
68. NYSDOL: New York State Department of Labor.
69. NYSDOL ICR 56: "NYSDOL ICR 56" shall mean Part 56 of the Official Compilation of Codes, Rules and Regulations of the State of New York or 12 NYCRR Part 56.
70. NYSDOH: The New York State Department of Health.
71. Obstruction: The blocking of a means of egress with any temporary structure or barrier. A double layer of fire-retardant 6-mil polyethylene sheeting shall not be considered an obstruction when it is prominently marked as an exit with photo luminescent signage or paint and cutting tools (knife, razor) are attached to the work area side of the sheeting for use in the event that the sheeting must be cut to permit egress. A corridor shall not be considered obstructed when there is a clear path measuring at least three (3) feet wide.
72. Occupied Area: Area of the work site where abatement is not taking place and where personnel or occupants normally function or where workers are not required to use personal protective equipment.
73. OSHA: Occupational Safety and Health Administration.
74. Outside air: "Outside air" shall mean the air outside the work place.
75. Person: Individual, partnership, company, corporation, association, firm, organization, governmental agency, administration, or department, or any other group of individuals, or any officer or employee thereof.
76. Personal Air Monitoring: Method used to determine employees' exposure to airborne asbestos fibers. The sample is collected outside the respirator in the worker's breathing zone.
77. Personal Protective Equipment (PPE): Appropriate protective clothing, gloves, eye protection, footwear, and head gear.
78. Phase Contrast Microscopy (PCM): The measurement protocol for the assessment of the fiber content of air. (NIOSH Method 7400).

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79. Physician: Person licensed or otherwise authorized under Article 131 Section 65.22 of the New York State Education Law.
80. Plasticize: To cover floors and walls with fire retardant plastic sheeting as herein specified or by using spray plastics as acceptable to the Department.
81. Polarized Light Microscopy (PLM): The measurement protocol for the assessment of the asbestos content of bulk materials. (Interim Method for the Determination of Asbestiform Materials in Bulk Insulation Samples- 40 CFR Part 763, Subpart F, Appendix A as amended on September 1, 1982)
82. Project Designer: A person who holds a valid Project Designer Certificate issued by the New York State Department of Labor.
83. Project Monitor: A person who holds a valid Project Monitor Certificate issued by the New York State Department of Labor.
84. Qualitative Fit Test: Individual test subject's responding (either voluntarily or involuntarily) to a chemical challenge outside the respirator face-piece. Acceptable methods include irritant smoke test, odorous vapor test, and taste test.
85. Quantitative Fit Test: Exposing the respiratory wearer to a test atmosphere containing an easily detectable, nontoxic aerosol, vapor or gas as the test agent. Instrumentation, which samples the test atmosphere and the air inside the face-piece of the respirator, is used to measure quantitatively the leakage into the respirator. There are a number of test atmospheres, test agents, and exercises to perform during the test.
86. Registered Design Professional: A person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York.
87. Removal: Stripping of any asbestos- containing materials from surfaces or components of a facility or taking out structural components in accordance with 40 CFR 61 Subparts A and M.
88. Renovation: An addition or alteration or change or modification of a building or the service equipment thereof, that is not classified as an ordinary repair as defined in §27-125 of the Administrative Code of the City of New York.
89. Repair: Corrective action using specified work practices (e.g., glovebag, plastic tent procedures, etc.) to minimize the likelihood of fiber release from minimally damaged areas of ACM.

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90. Replacement material: Any material used to replace ACM that contains less than .01 percent asbestos.
91. Shift: A worker's, or simultaneous group of workers', complete daily term of work.
92. Shower Room: Room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold running water controllable at the tap and arranged for complete showering during decontamination.
93. Small Asbestos Project: Asbestos project involving the disturbance (e.g., removal, enclosure, encapsulation) of more than 25 and less than 260 linear feet of ACM or more than ten and less than 160 square feet of ACM.
94. Staging Area: Work Area near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the Work Area.
95. Strip: To remove asbestos materials from any part of the facility.
96. Structural Member: Load-supporting member of a facility, such as beams and load-supporting walls, or any non-load-supporting member, such as ceiling and non-load-supporting walls.
97. Surface barriers: The plasticizing of walls, floors, and fixed objects within the work area to prevent contamination from subsequent work.
98. Surfactant: Chemical wetting agent added to water to improve penetration.
99. Transmission Electron Microscopy (TEM): The measurement protocol for the assessment of the asbestos fiber content of air. Interim Transmission Electron Microscopy Analytical Methods-40 CFR Part 763, Subpart E, Appendix A.
100. Visible Emissions: Emissions containing particulate material that are visually detectable without the aid of instruments.
101. Washroom: Room between the Work Area and the holding area in the equipment decontamination enclosure system where equipment and waste containers are wet cleaned and/or HEPA-vacuumed prior to disposal.
102. Waste decontamination enclosure system: "Waste decontamination enclosure system" shall mean the decontamination enclosure system designated for the controlled transfer of materials and equipment, consisting of a washroom and a holding area.

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103. Wet Cleaning: "Wet cleaning" shall mean the removal of asbestos fibers from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water.
104. Wet methods: "Wet methods" shall mean the use of amended water or removal encapsulants to minimize the generation of fibers during ACM disturbance.
105. Work Area: Designated rooms, spaces, or areas of the building or structure where asbestos abatement activities take(s) place.
106. Worker Decontamination Enclosure System: Portion of a decontamination enclosure system designed for controlled passage of workers and authorized visitors, consisting of a clean room, a shower room, and an equipment room separated from each other and from the Work Area by airlocks and curtained doorways.
107. Work Place: The work area and the decontamination enclosure system(s).
108. Work Place Safety Plan: Construction documents prepared by a registered design professional and submitted for review by DEP in order to obtain an asbestos abatement permit. Such plan shall include, but not be limited to, plans, sections, and details of the work area clearly showing the extent, sequence, and means and methods by which the work is to be performed.
109. Work Site: Premises where abatement activity is being performed. May be composed of one or more Work Areas.

### 1.06 STANDARD OPERATING PROCEDURES

- A. Develop and implement a written standard procedure for abatement work to ensure maximum protection and safeguard from asbestos exposure of the workers, visitors, employees, public, and environment.

- B. TELEPHONE PAGING DEVICE

The asbestos abatement contractor or his authorized representative shall, at all times during the normal workday or during periods of overtime work under this Contract, carry a digital telephone paging device ("Beeper") and/or cellular telephones which can be activated by a telephone number in the 212 or 646 or 718 or 917 or 929 area code. He shall supply the Department of Design and Construction with the activation number for the device and he is liable to respond back to the calls from DDC within the next one (1) hour period after he receives calls from DDC. The cost to the asbestos abatement contractor for this device and all charges accruing thereto is deemed included in the work..

- C. The standard operating procedure shall ensure:

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1. Tight security from unauthorized entry into the workspace.
  2. Restriction of asbestos abatement contractor's personnel to the immediate Work Area and access/egress routes.
  3. Donning of proper protective clothing and respiratory protection prior to entering the Work Area.
  4. Safe work practices in the work place, including provisions for inter-room communications, exclusion of eating, drinking, smoking, or in any way breaking the respiratory protection.
  5. Proper exit practices from the work space to the outside through the showering and decontamination facilities.
  6. Removing asbestos in a way that minimizes release of fibers.
  7. Packing, labeling, loading, transporting, and disposing of contaminated material in a way that minimizes exposure and contamination.
  8. Emergency evacuation procedures, for medical or safety situations, to minimize the potential exposure to airborne asbestos fibers for emergency personnel, building occupants, and building environment.
  9. Safety from accidents in the workspace, especially from electrical shocks, fall hazards associated with scaffolding, slippery surfaces, and entanglements in loose hoses and equipment.
  10. Provisions for effective supervision, air monitoring and personnel monitoring for exposure during the work.
  11. Engineering controls that minimize exposure to fibers within the workspace.
  12. The asbestos abatement contractor shall provide a 24-hour fire watch throughout the entire term of the project, to protect against fire and unauthorized entry into the workspace. Fire watch shall be performed by an individual who is a certified asbestos worker capable of entering the Work Area for regular inspections.
- D. Provide an Asbestos Handler Supervisor to provide continuous supervision of all work, and to be responsible for the following:
1. Ensure that individuals are using proper personal protective equipment, are trained in its use and hold valid NYCDEP and NYSDOL Asbestos Handler certificates

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2. Maintain entry log records and ensure that they are recorded in accordance with the provisions of Title 15, Chapter 1 of RCNY and NYSDOL ICR 56.
3. Surveillance of the Work Areas at a minimum of once per work shift or as required by Title 15, Chapter 1 of RCNY and NYSDOL ICR 56 -7.3, to ensure the integrity of work place isolation, negative pressure equipment and workers personal protective equipment is not torn or ripped and that respiratory protection is worn at all times.
4. Ensure that sufficient personal protective equipment is stored in the clean room.
5. Take precautions to prevent heat stress. Precautions include, but are not limited to, selecting lightweight protective clothing, reducing the work rate, and providing adequate fluid breaks.
6. Perform work area inspection with project monitor prior to the commencement of final clearance air monitoring.
7. The asbestos abatement contractor shall retain the asbestos handler supervisor to perform a visual inspection prior to the post-abatement clearance air monitoring to confirm that all containerized waste has been removed from work and holding areas and there is no visible ACM debris or residue on or about all abated surfaces.

### E. ENGINEERING CONTROLS

1. The 8-hour time weighted average airborne concentration of fibers to which any passerby may be exposed shall not exceed 0.01 fibers per cubic centimeter of air when fibers have a physical dimension longer than 5 micrometers as determined by the method prescribed in these Specifications.
2. All asbestos projects shall utilize negative pressure ventilation equipment.
  - a. The asbestos abatement contractor shall use a manometer to document the pressure differential. The asbestos abatement contractor shall install and make the manometer operational once the negative pressure has been established in the work area. Magnahelic manometers shall be calibrated at least every six months and a copy of the current calibration certification shall be available at the work site.
3. Negative pressure ventilation equipment shall be installed and operated to provide at least one air change in the work area every 15 minutes. Where there are no floor or wall barriers because floor or wall material is being abated, there shall be at least one air change in the work area every ten minutes.

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4. The negative pressure ventilation equipment shall operate continuously, 24 hours a day, from the establishment of isolation barriers through successful clearance air monitoring. If such equipment shuts off, adjacent areas shall be monitored for asbestos fibers.
5. A static negative air pressure of 0.02 inches (minimum) water column shall be maintained at all times in the work place during abatement to ensure that contaminated air in the Work Area does not filter back to uncontaminated areas.
6. If the contaminated area of an asbestos project covers the entire floor of the affected building, or an area greater than 15,000 square feet on any given floor, the installation of a negative air cut off switch or switches shall be required at a single location outside the work place, such as inside a stairwell, or at a secured location in the ground floor lobby when conditions warrant. The required switch or switches shall be installed by a licensed electrician pursuant to a permit issued by the Department of Buildings. If negative pressure ventilation equipment is used on multiple floors, the cut off switch shall be able to turn off the equipment on all floors.
7. On loss of negative pressure or electric power to the negative pressure ventilating units, abatement shall stop immediately and shall not resume until power is restored and negative pressure ventilation equipment is operating again.
8. Negative pressure ventilation equipment shall be exhausted to the outside of the building away from occupied areas.
  - a. All openings (including but not limited to operable windows, doors, vents, air intakes or exhausts of any mechanical devices) less than 15 feet from the exterior exhaust duct termination location shall be plasticized with two layers of fire retardant 6-mil polyethylene sheeting, or a second negative pressure ventilation unit with the primary unit's capacity shall be connected in series prior to exhausting to the outside.
  - b. Negative pressure ventilation equipment shall exhaust away from areas accessible to the public.
  - c. All ducting shall be sealed and braced or supported to maintain airtight joints. Ducts shall be reinforced and shall be installed so as to prevent breakage. Damage to ducts must be repaired immediately.



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9. Where ducting to the outside is not possible, a second negative pressure ventilation unit compatible with the primary unit's capacity shall be connected in series. The area receiving the exhaust shall have sufficient, non-recycling exhaust capacity to the outside of the structure.
10. In the event that there is a failure of the containment system or a breach in the Isolation Barriers, all abatement work will cease and the asbestos abatement contractor will immediately correct the condition. Abatement work will not resume until the Work Area has been smoke tested by the third party laboratory and approved by the Construction Project Manager.

### F. LOCKDOWN ENCAPSULATION PROCEDURES

1. The following procedures shall be followed to seal in non-visible residue while conducting lockdown encapsulation on all surfaces from which ACM has not been removed:
  - a. Only encapsulants rated as acceptable or marginally acceptable on the basis of Battelle Columbus Laboratory test procedures and rating requirements developed under the 1978 USEPA Contract shall be used for lockdown encapsulation.
  - b. The encapsulant solvent or vehicle shall not contain a volatile hydrocarbon unless reviewed and approved by DEP.
  - c. Latex paint with solids content greater than 15 percent shall be considered a lockdown sealant for coating all non-metallic surfaces.
  - d. Encapsulants shall be applied using airless spray equipment. Spraying is to occur at the lowest pressure range possible to minimize fiber release from encapsulant impact at the surface. It shall be applied with a consistent horizontal or vertical motion.
  - e. The cleaned layer of the surface barriers shall be removed from walls and floors.

The isolation barriers shall remain in place throughout cleanup. Decontamination enclosure systems shall remain in place and be utilized. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

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### 1.07 NOTIFICATIONS, PERMITS, WARNING SIGNS, LABELS, AND POSTERS

- A. The asbestos abatement contractor shall submit an Asbestos Project Notification (ACP-7) to the NYCDEP listing each work area within the building separately one week in advance of the start of work.
- B. The registered design professional shall obtain an asbestos abatement permit authorizing the performance of construction work as required for asbestos projects involving one or more of the following activities:
  - 1. Obstruction of an exit door leading to an exit stair or the exterior of the building;
  - 2. Obstruction of an exterior fire escape or access to that fire escape;
  - 3. Obstruction of a fire-rated corridor leading to an exit door;
  - 4. Removal of handrails in an exit stair or ramp;
  - 5. Removal or dismantling of any fire alarm system component including any fire alarm-initiating device (e.g., smoke detectors, manual pull station);
  - 6. Removal or dismantling of any exit sign or any component of the exit lighting system, including photo luminescent exit path markings;
  - 7. Removal or dismantling of any part of a sprinkler system including piping or sprinkler heads;
  - 8. Removal or dismantling of any part of a standpipe system including fire pumps or valves;
  - 9. Removal of any non-load bearing / non-fire-rated wall (greater than 45 square feet or 50 percent of a given wall);
  - 10. Any plumbing work other than the repair or replacement of plumbing fixtures;
  - 11. Removal of any fire-resistance rated portions of a wall, ceiling, floor, door, corridor, partition, or structural element enclosure including spray-on fire resistance rated materials;
  - 12. Removal of any fire damper, smoke damper, fire stopping material, fire blocking, or draft stopping within fire-resistance rated assemblies or within concealed spaces;
  - 13. Any work that otherwise requires a permit from the DOB (full demolitions, alterations, renovations, modifications or plumbing work).

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- C. The asbestos abatement contractor shall provide a floor plan showing the areas of the building under abatement and the location of all fire exits in said areas. It shall be prominently posted in the building lobby or comparable location, along with a notice stating the location within the building of the negative air cutoff switch, if applicable.
- D. The general contractor shall submit, as required, an asbestos abatement permit due to one or more of the activities listed in 1.07 (B) (1-8) and (B) (13) of this specification. The asbestos abatement contractor is responsible for submitting, with an asbestos project notification, a work place safety plan (WPSP) and any other applicable construction documents. These documents must be prepared by a registered design professional.
- E. A WPSP is not required for projects requiring an asbestos abatement permit due to one or more of the activities listed in 1.07 (B) (9-12) of this specification. The asbestos abatement contractor shall submit, together with the asbestos project notification, all applicable asbestos abatement permit construction documents.
- F. The general contractor shall retain a Registered Design Professional to perform the inspections required pursuant to Title 28 of the Administrative Code, including but not limited to special inspections required by Chapter 17 of the Building Code, as follows:
  - 1. A final inspection shall be performed by a registered design professional retained by the asbestos abatement contractor after all work authorized by the asbestos abatement permit is completed. The person performing the inspection shall note all failures to comply with the provisions of the Building Code or approved asbestos abatement permit and shall promptly notify the owner in writing. All defects noted in such inspection shall be corrected. The final inspection report shall either:
    - a. Confirm:
      - (1) That the construction work is complete, including the reinstallation or reactivation of any building fire safety or life safety component.
      - (2) That any defects previously noted have been corrected.
      - (3) That all required inspections were performed.
      - (4) That the work is in substantial compliance with the approved asbestos abatement permit construction documents, the Building Code, and other applicable laws and rules.
    - b. Confirm:

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- (1) That the construction work does not return the building (or portion thereof) affected by the abatement project to a condition compliant with the building code and other applicable laws and rules, but that the registered design professional has reviewed an application for asbestos abatement permit construction documents approval that has been approved by the department of buildings, and the subsequent scope of work as approved will, upon completion, render all areas affected by the asbestos project in full compliance with the building code and all applicable laws and rules.
  - (2) That any defects previously noted that are not addressed by the subsequent scope of work as approved by the department of buildings, have been corrected.
  - (3) That all required inspections that are not addressed by the subsequent scope of work as approved by the department of buildings were performed.
  - (4) That all completed work pursuant to an asbestos abatement permit is in substantial compliance with the approved asbestos abatement permit construction documents.
- G. The general contractor shall provide the final inspection reports to be filed with DEP on A-TR1 form. Records of final inspections made by registered design professionals shall be submitted to DDC as part of the close out document package.
- H. Erect bilingual (English-Spanish) warning signs around the work space and at every point of potential entry from the outside and at main entrance to building which can be viewed by the public without obstruction, in accordance with OSHA 29 CFR 1926.1101 (K) (Sign Specifications) and Title 15, Chapter 1 of RCNY. The warning signs shall be a bright color so that they will be easily noticeable. The size of the sign and the size of the lettering shall be no less than OSHA requirements.
- I. Provide the required labels for all polyethylene bags and all drums utilized to transport contaminated material to the landfill in accordance with OSHA 29 CFR 1926.1101 (K)(2) and by 49 CFR Parts 171 and 172 of the Department of Transportation regulations.
- J. Provide any other signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn people of the hazard from asbestos exposure. Post in a prominent and convenient place for the workers a copy of the latest applicable regulations from OSHA, EPA, NIOSH, State of New York and

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New York City and any additional items mandated for posting by the aforementioned regulations.

- K. Furnish all permits, variances and notices required to perform the Work.

### 1.08 EMERGENCY PRECAUTIONS

- A. Establish emergency and fire exits from the Work Area. The clean side of all emergency exits shall be equipped with two full sets of protective clothing and respirators at all times.
- B. Notify local medical emergency personnel, both ambulance crews and hospital emergency room staff prior to commencement of abatement operations as to the possibility of having to handle contaminated or injured workmen, and shall be advised on safe decontamination.
- C. Prepare to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated immediately for decontamination. When an injury occurs, precautions shall be taken to reduce airborne fiber concentrations (i.e., misting of the air with water) until the injured person has been removed from the Work Area.
- D. Notify, before actual removal of the asbestos material, the local police and fire departments to the danger of entering the Work Area. Asbestos abatement contractor shall make every effort to help these agencies form plans of action should their personnel need to enter the contaminated area.

### 1.09 SUBMITTALS

- A. Pre-Construction Submittals:
  - 1. Attend a pre-construction meeting scheduled by the City of New York Department of Design and Construction. This meeting shall also be attended by a designated representative of the City of New York third party air monitoring firm, facility manager and the Construction Project Manager. At this meeting, the asbestos abatement contractor shall present three copies of the following items, bound and indexed. The detailed plan of action must be submitted at least five (5) days prior to the pre-construction meeting.
    - a. Asbestos abatement contractor's scope of work, work plan and schedule.
    - b. Asbestos project notifications, approved variances and plans to Government Agencies.
    - c. Copies of Permits, clearance and licenses if required.

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- d. Schedules: the asbestos abatement contractor shall provide to the Construction Project Manager a copy of the following schedules for approval. Once approved, schedules shall be maintained and updated as received. Asbestos abatement contractor shall post a copy of all schedules at the site:
  - (1) A construction schedule stating critical dates of the project including, but not limited to, mobilization, Work Area preparation, demolition, gross removal, fine cleaning, encapsulation, inspections, clearance monitoring, and phase of refinishing and final inspections. The schedule shall be updated biweekly, at a minimum.
  - (2) A schedule of staffing stating number of workers per shift per activity, name and number of supervisor(s) per shift, shifts per day, and total days to be worked.
  - (3) Submit all changes in schedule or staffing to the Construction Project Manager prior to implementation.
  - (4) A schedule of equipment to be used including numbers and types of all major equipment such as HEPA Air Filtration Units, HEPA-vacuums, airless sprayers, Water Atomizing Devices and Type "C" compressors.
- e. A written plan and shop drawings for preparation of work site and decontamination chamber.
- f. Description of protective clothing and approved respirator to be used, make, model, NIOSH approval numbers.
- g. Delineation of responsibility of work site supervision, including competent person, with names, resumes, and home telephone numbers.
- h. Explanation of decontamination sequence and isolation techniques.
- i. Description of specific equipment to be utilized, including make and model number of air filtration devices, vacuums, sprayers, etc.
- j. Description of any prepared methods, procedures, techniques, or equipment other than those specified in the Contract Documents.
- k. Explanation of the handling of asbestos contaminated wastes including EPA and NYCDEP identification numbers of Waste Hauler.

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- l. Description of the final clean-up procedures to be used.
- m. Name and qualifications of asbestos abatement contractor's Air Monitor including AIHA accreditation, and proof of NIOSH PAT and NIST/NVLAP Bulk Quality Assurance Proficiency of OSHA samples for approval by the City of New York Department of Design and Construction.
- n. Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number) and procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.
- o. Material Safety Data Sheets (MSDS) for encapsulants, sealants, firestopping foam, cleaners/disinfectants, spray adhesive and any and all potentially hazardous materials that may be employed on the project. No work involving the aforementioned will be allowed to proceed until MSDS are reviewed.
- p. Worker Training and Medical Surveillance: Asbestos abatement contractor shall submit a list of the persons who will be employed by him in the removal work. Present evidence that workers have received proper training required by the regulations and the medical examinations required by OSHA 29 CFR 1926.1101.
- q. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.
  - (1) The asbestos abatement contractor shall provide a permanently bound log book of minimum 8-1/2" x 11" size at the entrance to the Worker and Waste Decontamination enclosure system as hereinafter specified. Log book shall contain on title page the project name, name, address and phone number of Environmental Control Representative; name, address and phone number of asbestos abatement contractor; name, address and phone number of asbestos abatement contractor and City's air testing entity; emergency numbers including, but not limited to local Fire/Rescue Department. Log book shall contain a list of personnel approved by the laboratory for entry into the Work Area.
  - (2) All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area.

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Under no circumstances shall pencil entries be permitted. Any significant events occurring during the abatement project shall be entered into the log. Upon completion of the job, the Asbestos abatement contractor shall submit a copy of the logbook containing a day-to-day record of personnel log entries countersigned by the Construction Project Manager every day.

- r. Worker's Acknowledgments: Submit statements signed by each employee that the employee has received training in the proper handling of ACM, understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.

B. Submit copies of the following items to the Construction Project Manager during the work:

1. Security and safety logs showing names of person entering workspace, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.
2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted daily to the Construction Project Manager.
3. Floor plans indicating asbestos abatement asbestos abatement contractor's current work progress shall be submitted for review by the Construction Project Manager at weekly progress meetings.
4. All asbestos abatement contractors' air monitoring and inspection results.

C. Project Closeout Submittals:

Upon completion of the project and as a condition of acceptance, the asbestos abatement contractor shall present two copies of the following items, bound and indexed:

1. Lien Waivers from asbestos abatement contractor, Sub-asbestos abatement contractors and Suppliers,
2. Daily OSHA air monitoring results,
3. All Waste Manifests (Asbestos and Construction Debris), seals and disposal logs,
4. Field Sign-In/Sign-Out Logs for every shift,
5. Copies of all Building Department Forms and Permits,



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6. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations,
7. All Warranties as stated in the Specifications,
  - a. Fully executed disposal certificates and transportation manifest.
8. Project Record: The asbestos abatement contractor shall maintain a project record for all small and large asbestos projects. During the project, the project record shall be kept on site at all times. Upon completion of the project, the project record shall be maintained by the building owner. The project record shall be submitted to DDC as part of the close out documents. The project record shall consist of:
  - a. Copies of licenses of all asbestos abatement contractors involved in the project;
  - b. Copies of DEP and NYSDOL supervisor and handler certificates for all workers engaged in the project;
  - c. Copies of all project notifications and reports filed with DEP and NYSDOL for the project, with any amendments or variances;
  - d. Copies of all asbestos abatement permits, including associated approved plans and work place safety plan;
  - e. A copy of the air sampling log and all air sampling results;
  - f. A copy of the abatement asbestos abatement contractor's daily log book;
  - g. All data related to bulk sampling including the results of any asbestos surveys performed by an asbestos investigator;
  - h. Copies of all asbestos waste manifests;
  - i. A copy of all Project Monitor's Reports (ACP-15).
  - j. A copy of each ATR-1 Form completed for the asbestos project (if required).
  - k. A copy of each Asbestos Project Conditional Closeout Report (ACP-20).
  - l. A copy of the Asbestos Project Completion Form (ACP-21).

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9. The asbestos abatement contractor shall submit one of the following certifications to the DOB, with a copy provided to DDC:
  - a. Asbestos Project Completion Form. If an asbestos project has been performed, a copy of the asbestos project completion form issued by DEP shall be submitted to DOB, with a copy being provided to DDC, prior to the issuance of a DOB permit and to any amendment of the underlying construction document approval which increases the scope of the project to include (a) work area(s) not previously covered.
  - b. An Asbestos Project Conditional Close-out Form. If an asbestos project has been performed a copy of the asbestos project conditional close-out form issued by DEP shall be submitted to DOB, with a copy being provided to DDC, prior to the issuance of a DOB permit and to any amendment of the underlying construction document approval which increases the scope of the project to include (a) work area(s) not previously covered.

### 1.10 QUALITY ASSURANCE

- A. All work required for the completion of this project or called for in this Specification must be executed in a workmanlike manner by using the appropriate methods established by regulatory requirements and/or industrial standards. All workmanship or work methods are subject to review and acceptance by the Construction Project Manager. Throughout the Specification, reference is made to codes and standards which establish qualities, levels or types of workmanship which will be considered acceptable. It is the asbestos abatement contractor's responsibility to comply with these codes and standards during the execution of this work.
- B. All materials and equipment required or consumed during the work of this Contract must meet the minimum acceptable criteria established by codes and standards referenced elsewhere in this Specification. Materials and equipment must be submitted for prior approval as part of the asbestos abatement contractor's "Shop Drawings".
- C. It is the asbestos abatement contractor's responsibility, when so required by the Specification or upon written request from the Commissioner or his representative to furnish all required proof that workmanship, materials and/or equipment meet or exceed the codes and standards referenced. Such proof shall be in the form requested, typically a certified report or test conducted by a testing entity approved for that purpose by DDC.

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- D. The a asbestos abatement contractor shall furnish proof that employees working under his supervision have had instruction on the dangers of asbestos exposure, on respirator use, decontamination, and OSHA regulations. This proof shall be in the form of a notarized affidavit to the effect that the above requirements have been satisfied.
- E. The a asbestos abatement contractor will have at all times in his possession and in view at the job site the OSHA regulations 29 CFR 1910.1001, and 1926.1101 Asbestos, and Environmental Protection Agency 40 CFR, Part 61, subpart B: National Emission Standard for asbestos, asbestos stripping, work practices and disposal of asbestos waste. He shall also have one copy of NYC Title 15, Chapter 1 of RCNY and NYS DOL ICR 56 at the job site at all times.
- F. Familiarity with Pertinent Codes and Standards: In procuring all items used in this work, it is the a asbestos abatement contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this work meet or exceed the specified requirements, and are suitable for their intended use.
- G. Rejection of Non Complying Items: The Commissioner reserves the right to reject items incorporated into the work that fail to meet the specified minimum requirements. The Commissioner further reserves the right, and without prejudice to other recourse that maybe taken, to accept non-complying items subject to an adjustment in the Contract amount as approved by the City.
- H. Applicable Regulations, Codes and Standards: Applicable standards listed in these Specifications include, but are not necessarily limited to, standards promulgated by the following agencies and organizations:
1. American National Standards Institute (ANSI)  
(Successor to USASI and ASA)  
25 West 43<sup>rd</sup> Street (between 5<sup>th</sup> and 6<sup>th</sup> Avenue) 4<sup>th</sup> Floor  
New York, NY 10036  
212-642-4900
  2. American Society for Testing and Materials (ASTM)  
100 Bar Harbor Drive  
West Conshohocken, PA 19428-2959  
610-832-9500
  3. National Institute for Occupational Safety and Health (NIOSH)  
Robert A. Taft Laboratory  
4676 Columbia Pkwy  
Mailstop R12 Cincinnati, Ohio 45226  
513-841-4428

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4. National Electrical Code (NEC)  
See NFPA
5. National Fire Protection Association (NFPA)  
1 Batterymarch Park  
Quincy, Massachusetts 02169-7471  
617-770-3000
6. New York City Fire Department (FDNY)  
9 Metrotech Center  
Brooklyn, NY 11201-5431  
718-999-2117
7. New York City Department of Buildings (NYC DOB)  
Enforcement Division  
280 Broadway, New York, New York 10007  
212- 566-2850
8. New York City Department of Environmental Protection (NYCDEP)  
Bureau of Environmental Compliance  
Asbestos Control Program  
59-17 Junction Boulevard, 8<sup>th</sup> Floor  
Corona, New York 11368  
718-595-3682
9. New York City Department of Health and Mental Hygiene (NYC DOHMH)  
Environmental Investigation  
125 Worth Street  
New York, New York 10013  
212-442-3372
10. New York State Department of Labor (NYSDOL)  
Division of Safety and Health  
Engineering Services Unit  
State Office Building Campus  
Albany, New York 12240-0010
11. New York City Department of Sanitation  
125 Worth Street, Room 714  
New York, New York 10013  
212-566-1066
12. Occupational Safety and Health Administration (OSHA)  
Region II - Regional Office  
201 Varick Street, Room 908  
New York, New York 10014  
212-337-2378

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13. United States Environmental Protection Agency (EPA or USEPA)  
Region II  
Asbestos NESHAPS Contact  
Air and Waste Management Division  
(Air Compliance Branch) – USEPA  
290 Broadway, 21<sup>st</sup> Floor  
New York, New York 10007-1866  
212-637-3660

- I. Post all applicable regulations in a conspicuous place at the job site. Assure that the regulations are not altered, defaced or covered by other materials. One copy of each regulation must also be kept at the Asbestos abatement contractor's office.

### 1.11 CITY/ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITIES

- A. The normal occupants of the Work Areas will be relocated by the City prior to the performance of the abatement work and returned there to at the conclusion of the abatement work, at no cost to the asbestos abatement contractor. However, the asbestos abatement contractor shall protect all furniture and equipment in the Work Areas in a manner as hereinafter specified. In addition, the asbestos abatement contractor shall perform the work of this Contract in a manner that will be least disruptive to the normal use of the non-Work Areas in the building.
- B. Asbestos abatement contractor shall be responsible for cleaning all portable items not specifically addressed by the Facility, in the Work Areas, or dispose of same as asbestos contaminated waste.
- C. Facility to provide asbestos abatement contractor with a list of items that cannot be removed and need special attention.
- D. Facility to stop all deliveries that may be scheduled to the Work Area while work is in progress.
- E. Facilities to have authorized personnel on site at all times or supply the asbestos abatement contractor with means of contacting such personnel without unreasonable delay. Such personnel shall have access to all areas, have knowledge of electrical, and air handling equipment. Such personnel shall assist the asbestos abatement contractor in case of any power failure or breakdown to shut down air supply systems, to reset and control all protective systems such as alarms, sprinklers, locks, etc. The Facility shall ensure no active air handling systems are operating within the Work Area.
- F. City will not occupy the portions of the building, in which work is being performed during the entire asbestos removal operation, including completion of clean up.

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- G. Asbestos abatement contractor shall provide a plan for 24 hour job security both for prevention of theft and for barring entry of curious but unprotected personnel into Work Areas.
- H. Asbestos abatement contractor shall provide surveillance by a fire watch and set forth procedures to be taken for the safety of building occupants in the event of an emergency, in accordance with the WPSP.
- I. Should the failure of any utility occur, the City will not be responsible to the asbestos abatement contractor for loss of time or any other expense incurred.
- J. Facility will be responsible to notify the asbestos abatement contractor of any planned electrical power shutdowns in order to ensure that there are no power interruptions in the negative air pressure systems.
- K. Asbestos abatement contractor shall remove all flammable materials from the work area and all sources of ignition (including but not limited to pilot lights) shall be extinguished.
- L. Asbestos abatement contractor shall require a competent person (as defined in OSHA 1926.1101) to perform the following functions and to be on-site continuously for the duration of the project:
  - 1. Monitor the set up of the Work Area enclosure and ensure its integrity.
  - 2. Control entry and exit into the work enclosure.
  - 3. Ensure that employees are adequately trained in the use of engineering controls, proper work practices, proper personal protective equipment and in decontamination procedures.
  - 4. Insure that employees use proper engineering controls, proper work practices, proper personal protective equipment and proper decontamination procedures.
  - 5. The competent person (as defined in OSHA1926.1101) shall check for rips and tears in work suits, and ensure that they are mended immediately or replaced.

### 1.12 USE OF BUILDING FACILITIES

- A. City shall make available to the asbestos abatement contractor, from existing outlets and supplies, all reasonably required amounts of water and electric power at no charge.

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- B. Electric power to all Work Areas shall be shut down and locked out except for electrical equipment that must remain in service. Safe temporary power and lighting shall be provided by asbestos abatement contractor in accordance with applicable codes. All power to Work Areas shall be brought in from outside the area through ground-fault interrupter circuits installed at the source. Stationary electrical equipment within the Work Area, which must remain in service, shall be adequately protected, enclosed and ventilated. The Facility will identify all electric lines that must remain in service. Asbestos abatement contractor shall protect all lines.
- C. Asbestos abatement contractor shall provide, at his own expense, all electrical, water, and waste connections, tie-ins, extensions, and construction materials, supplies, etc. All water tie-ins shall be hard piped with polyethylene or copper piping. At the end of each shift, asbestos abatement contractor shall disconnect all hoses within the work zone and place in equipment room of the worker decontamination unit. Asbestos abatement contractor shall ensure positive shutoff of all water to Work Area during non-working hours.
- D. Utilities:
1. General:  
All temporary facilities required to be installed, shall be subject to the approval of the Commissioner. Prior to starting the work at any site; specify clearly the temporary locations of facilities preferably with sketches and submit the same to the Construction Project Manager for approval.
  2. Water:  
The Department of Design and Construction will furnish all water needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. All temporary plumbing or adaptations to supply the needs of the Work Area shall be installed and removed by the asbestos abatement contractor and the cost thereof included in the Lump Sum price for abatement work. Shower water for the decontamination unit shall be provided hot. Heating of water, if necessary, shall be provided by the asbestos abatement contractor.
  3. Electricity:  
The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. All temporary electrical work or adaptations to supply the needs of the Work Area shall be installed and removed by the asbestos abatement contractor and the cost thereof included in the Lump Sum price for abatement work.

In leased spaces, arrangements for water supplies and electricity must be made with the landlord. However, all such arrangements must be made through and are subject to approval of the Department of Design and

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Construction. Utilities will be provided at no cost to the Asbestos abatement contractor. However, it is the asbestos abatement contractor's (or the General contractor's) responsibility to furnish and install a suitable distribution system to the Work Area. This system will be provided at no cost to the City.

A dedicated power supply for the negative pressure ventilating units shall be utilized. The negative air equipment shall be on a ground fault circuit interrupter (GFCI) protected circuit separate from the remainder of the work area temporary power circuits.

- E. Asbestos abatement contractor shall shut down and lock out all electric power to all work areas except for electrical equipment that must remain in service. Safe temporary power and lighting shall be provided in accordance with all applicable codes. Existing light sources (e.g., house lights) shall not be utilized. All power to work areas shall be brought in from outside the area through ground-fault circuit interrupter at the source.
1. If electrical circuits, machinery, and other electrical systems in or passing through the work area must stay in operation due to health and safety requirements, the following precautions must be taken:
    - a. All unprotected cables, except low-voltage (less than 24 volts) communication and control system cables, panel boxes of cables and joints in live conduit that run through the work area shall be covered with three (3) independent layers of six (6) mil fire retardant polyethylene. Each layer shall be individually duct taped and sealed. All three (3) layers of polyethylene sheeting shall be left in place until satisfactory clearance air sampling results have been obtained.
    - b. Any energized circuits remaining in the work area shall be posted with a minimum two (2) inch high lettering warning sign which reads: DANGER LIVE ELECTRICAL - KEEP CLEAR. A sign shall be placed on all live covered barriers at a maximum of ten (10) foot intervals. These signs shall be posted in sufficient numbers to warn all persons authorized to enter the work area of the existence of the energized circuits.
  2. Any source of emergency lighting which is temporarily blocked as a result of work place preparation shall be replaced for the duration of the project by battery operated or temporary exit signs, exit lights, or photo luminescent path markings.
- F. Asbestos abatement contractor shall provide a separate temporary electric panel board to power asbestos abatement contractor's equipment. The Facility will designate an existing electrical source in proximity to the Work Area. Asbestos abatement contractor's licensed electrician shall provide temporary tie-in via cable,



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outlet boxes, junction boxes, receptacles and lights, all with ground fault interruption. At no time shall extension cords greater than 50-feet in length be allowed. All temporary electrical installation shall be in accordance with OSHA regulations. The electric shut down for power panel tie-in will be on off-hours and must be coordinated with the Facility. Asbestos abatement contractor shall provide to the City a specification and drawing outlining his power requirements at the pre-construction meeting.

- G. Additional electrical equipment (i.e., transformers, etc.), which is necessary due to the lack of existing power on the floor, shall be at the asbestos abatement contractor's expense.
- H. Asbestos abatement contractor shall provide fire protection in accordance with all State and Local fire codes.
- I. Sprinklers, standpipes, and other fire suppression systems shall remain in service and shall not be plasticized.
- J. When temporary service lines are no longer required, they shall be removed by the asbestos abatement contractor. Any parts of the permanent service lines, grounds and buildings, disturbed or damaged by the installation and/or removal of the temporary service lines, shall be restored to their original condition by the asbestos abatement contractor. Senior Stationary Engineer will inspect and test all switches, controls, gauges, etc. and shall submit a list to the Construction Project Manager of any equipment damaged by the asbestos abatement contractor.
- K. Asbestos abatement contractor shall supply hot shower water necessary for use in the decontamination unit.

### 1.13 USE OF THE PREMISES

- A. Asbestos abatement contractor shall confine his apparatus, the storage of materials, and supplies, and the operation of his workmen to limits established by law, ordinances, and the directions of the Construction Project Manager and the Facility. All flammable or combustible materials shall be properly stored to obviate fire and in areas approved by the Facility.
- B. Asbestos abatement contractor shall assure that no exits from the building are obstructed, that appropriate safety barriers are established to prevent access, and that Work Areas are kept neat, clean, and safe.
- C. Asbestos abatement contractor shall maintain exits from the work area or alternative exits shall be established, in accordance with section 1027 of the New York City Fire Code. Exits shall be checked at the beginning and end of each work shift against blockage or impediments to exiting.

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- D. If the openings of temporary structural partitions related to abatement work areas block egress, the partition shall consist of two sheets of fire retardant 6-mil plastic, prominently marked as an exit with photo luminescent paint or signage. Cutting tools (e.g., knife, razor) shall be attached to the work area side of the sheeting for use in the event that the barrier must be cut open to allow egress.
- E. All surrounding work, fixtures, soil lines, drains, water lines, gas pipes, electrical conduit, wires, utilities, duct work railings, shrubbery, landscaping, etc. which are to remain in place shall be carefully protected and, if disturbed or damaged, shall be repaired or replaced as directed by the City, at no additional cost.
- F. All routes through the building to be used by the asbestos abatement contractor shall first be approved by the Construction Project Manager and the Facility.
- G. Attention is specifically drawn to the fact that other asbestos abatement contractors, performing the work of other Contracts, may be (or are) brought upon any of the work sites of this Contract. Therefore, the asbestos abatement contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other asbestos abatement contractors who may be on (or are on) any site of the work of this Contract. Regulated area exempted.
- H. Temporary toilet facilities must be provided by the asbestos abatement contractor on the site. Coordinate location of facilities with Construction Project Manager. No toilet facilities will be allowed in the Work Area.

### 1.14 PROTECTION AND DAMAGE

- A. The asbestos abatement contractor is responsible to cover all furniture and equipment that cannot be removed from Work Areas. Moveable furniture and equipment will be removed from Work Areas by asbestos abatement contractor prior to start of work and returned upon successful completion of the final air testing. At the conclusion of the work (after clearance level of air testing reaches the acceptable limit), the asbestos abatement contractor will remove all plastic covering from the walls, floors, furniture, equipment and reinstall furniture and equipment in the cleaned Work Area. The asbestos abatement contractor shall remove all shades, curtains and drapes from the Work Area, and reinstall the same following the final clean up.
- B. Prior to plasticizing, the proposed work areas shall be pre-cleaned using HEPA filtered vacuum equipment and/or wet cleaning methods. Methods that raise dust, such as sweeping or vacuuming with equipment not equipped with HEPA filters, are prohibited.
- C. Use rubber tired vehicles that use non-volatile fuels for conveying material inside building and provide temporary covering, as necessary, to protect floors.

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- D. No materials or debris shall be thrown from windows or doors of the building. Building waste system shall NOT be used to remove refuse.
- E. Debris shall be removed from the work site daily. Premises shall be left neat and clean after each work shift, so that work may proceed the next regular workday without interruption. Limited bag storage may take place within the Work Area when approved by the Construction Project Manager.
- F. Protect floors and walls along removal routes from damage, wear and staining with contamination control flooring. All finished surfaces to be protected with Masonite or other rigid sheathing material.
- G. A preliminary inspection for pre-existing damage shall be conducted by asbestos abatement contractor and representative of the City before commencement of the project.

### 1.15 RESPIRATORY PROTECTION REQUIREMENTS

- A. Respiratory protection shall be worn by all individuals who may be exposed to asbestos fibers from the initiation of the asbestos project until all areas have successfully passed clearance air monitoring in accordance with Regulations and these Specifications.
- B. Asbestos abatement contractor shall develop and implement a written respiratory protection program with required site-specific procedures and elements. The program shall be administered by a properly trained individual. The written respiratory protection program shall include the requirements set forth in OSHA Standard 29 CFR 1910.134, at a minimum.
- C. The Asbestos abatement contractor shall provide workers with individually issued and marked respiratory equipment. Respiratory equipment shall be suitable for the asbestos exposure level(s) in the Work Area(s), as specified in OSHA Standards 26 CFR 1910.134 and 29 CFR 1926.1101, NIOSH Standard 42 CFR 84, or as more stringently specified otherwise, herein.
- D. Where respirators with disposable filter parts are employed, the asbestos abatement contractor will provide sufficient filter parts for replacement as necessary or as required by the applicable regulation.
- E. All respiratory protection shall be NIOSH approved. All respiratory protection shall be provided by asbestos abatement contractor, and used by workers in conjunction with the written respiratory protection program.
- F. Asbestos abatement contractor shall provide respirators selected by an Industrial Hygienist that meet the following requirements:

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Table 1. -- Assigned Protection Factors<sup>5</sup>

Type of Respirator <sup>1,2</sup>	Half mask	Full facepiece	Helmet/hood
1. Air-Purifying Respirator	<sup>3</sup> 10	50	.....
2. Powered Air-Purifying Respirator (PAPR)	50	1,000	<sup>4</sup> 25/1,000
3. Supplied-Air Respirator (SAR) or Airline Respirator			
• Demand mode	10	50	.....
• Continuous flow mode	50	1,000	<sup>4</sup> 25/1,000
• Pressure-demand or other positive-pressure mode	50	1,000	.....
4. Self-Contained Breathing Apparatus (SCBA)			
• Demand mode	10	50	50
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)	.....	10,000	10,000

Notes:

<sup>1</sup>Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

<sup>2</sup>The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

<sup>3</sup>This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

<sup>4</sup>The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

<sup>5</sup>These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

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- G. Selection of high efficiency filters:
1. All high efficiency filters shall have a nominal efficiency rating of 100 (99.97-percent effective) when tested against 0.3-micrometer monodisperse diethyl-hexyl phthalate (DOP) particles.
  2. Choose N-, R-, or P-series filters based upon the presence or absence of oil particles.
    - a. N-series filters shall only be used for non-oil solid and water based aerosols or fumes.
    - b. R- and P-series filters shall be used when oil aerosols or fumes (i.e., lubricants, cutting fluids, glycerin, etc.) are present. The R-series filters are oil resistant and the P-series filters are oil proof.
    - c. Follow filter manufacture recommendations.
  3. If a vapor hazard exists, use an organic vapor cartridge in combination with the high efficiency filter.
- H. Historical airborne fiber level data may serve as the basis for selection of the level of respiratory protection to be used for an abatement task. Historical data provided by the asbestos abatement contractor shall be based on personal air monitoring performed during work operations closely resembling the processes, type of material, control methods, work practices, and environmental conditions present at the site. Documentation of aforementioned results may be requested by the City and/or Third-Party Air Monitor for review. This will not relieve the asbestos abatement contractor from providing personal air monitoring to determine the time-weighted average (TWA) for the work under contract. The TWA shall be determined in accordance with 29 CFR 1926.1101.
- I. At no time during actual removal operations shall half-mask air purifying respirators be allowed unless a full 8-hour TWA and excursion limit have been conducted, and reviewed by the Construction Project Manager. If the TWA and excursion limit have not been conducted, a Supplied-Air Respirator (SAR) or Airline Respirator or Self-Contained Breathing Apparatus (SCBA) must be used. Use of single use dust respirators is prohibited for the above respiratory protection.
- J. Workers shall be provided with personally issued and individually marked respirators. Respirators shall not be marked with any equipment that will alter the fit of the respirator in any way. Only waterproof identification markers shall be used.

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- K. Asbestos abatement contractor shall ensure that the workers are qualitatively or quantitatively fit tested by an Industrial Hygienist initially and every 12 months thereafter with the type of respirator he/she will be using.
- L. Whenever the respirator design permits, workers shall perform the positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow as specified by the manufacturer.
- M. No facial hairs (beards) shall be permitted to be worn when wearing respiratory protection that requires a mask-to-face seal.
- N. If a worker wears glasses, a spectacle kit to fit their respirator shall be provided by the asbestos abatement contractor at the asbestos abatement contractor's expense.
- O. Respiratory protection maintenance and decontamination procedures shall meet the following requirements:
  - 1. Respiratory protection shall be inspected and decontaminated on a daily basis in accordance with OSHA 29 CFR 1910.134 (b); and
  - 2. High efficiency filters for negative pressure respirators shall be changed after each shower; and
  - 3. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower when going through decontamination procedures as stated in Section 3.03 and/or 3.04.
  - 4. Airline respirators with high efficiency filtered disconnect shall be disconnected in the equipment room and worn into the shower. Powered air-purifying respirator face pieces shall be worn into the shower. Filtered/power pack assemblies shall be decontaminated in accordance with manufacturers recommendations; and
  - 5. Respirators shall be stored in a dry place and in such a manner that the face-piece and exhalation valves are not distorted; and
  - 6. Organic solvents shall not be used for washing of respirators.
- P. Authorized visitors shall be provided with suitable respirators and instruction on the proper use of respirators whenever entering the Work Area. Qualitative fit test shall be done to ensure proper fit of respirator.

### 1.16 PROTECTIVE CLOTHING

- A. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. Provide to all workers, foremen, superintendents, authorized visitors and inspectors, protective disposable clothing consisting of full

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body coveralls, head covers, gloves and 18-inch high boot type covers or reusable footwear.

- B. In addition to personal protective equipment for workers, the asbestos abatement contractor shall make available at each worksite at least four (4) additional uniforms and required respiratory equipment each day for personnel who are authorized to inspect the work site. He/she shall also provide, for the duration of the work at any site involving a decontamination unit for worksite access, a lockable storage locker for use by the Construction Project Manager. In addition to respiratory masks for workers, the asbestos abatement contractor must have on hand at the beginning of each work day, at least four (4) masks each with two sets of fresh filters, for use by personnel who are authorized to inspect the worksite. The asbestos abatement contractor shall check for proper fit of the respirators of all City personnel authorized to enter the Work Area.
- C. Asbestos handlers involved in tent procedures shall wear two (2) disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment. All street clothes shall be removed and stored in a clean room within the work site. The double layer personal protective equipment shall be used for installation of the tent and throughout the procedure, if a decontamination unit (with shower and clean room) is contiguous to the Work Area, only one (1) layer of disposable personal protective equipment shall be required; in this case, prior to exiting the tent the worker shall HEPA vacuum and wet clean the disposable suit.
- D. The outer disposable suit (if 2 suits are worn) shall be removed and remain in the tent upon exiting. Following the tent disposal and work site clean up the workers shall immediately proceed to a shower at the work site. The inner disposal unit and respirator shall be removed in the shower after appropriate wetting. The disposal clothing shall be disposed of as asbestos-containing waste material. The workers shall then fully and vigorously shower with supplied liquid bath soap, shampoo, and clean dry towels.
- E. Coveralls: provide disposable full-body coveralls and disposable head covers. Require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes for all workers in the Work Area.
- F. Boots: provide work boots with non-skid soles, and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers. Paint uppers of all boots yellow with waterproof enamel. Do not allow boots to be removed from the Work Area for any reason after being contaminated with ACM and/or dust.
- G. Hard Hats: provide hard hats as required by OSHA for all workers, and provide a minimum of four spares for Inspectors, visitors, etc. Label all hats with same warning label as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may cause potential head injury. Provide hard hats of the type with polyethylene strap suspension. Require hats to remain in the Work

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Area throughout the work. Thoroughly clean and decontaminate and bag hard hats prior to removing them from the Work Area at the end of the work.

- H. Goggles: provide eye protection (goggles) as required by OSHA for all workers involved in any activity that may potentially cause eye injury. Require them to be worn at all times during these activities. Thoroughly clean and decontaminate goggles before removing them from the Work Area.
- I. Gloves: provide work gloves to all workers, of the type dictated by the Work and OSHA Standards. Do not remove gloves from the Work Area. Dispose of as asbestos-asbestos contaminated waste at the end of the work. Gloves shall be worn at all times, except during Work Area Preparation activities that do not disturb ACM.
- J. Reusable footwear, hard hats and eye protection devices shall be left in the contaminated Equipment Room until the end of the Asbestos Abatement Work.
- K. Disposable protective clothing shall be discarded and disposed of as asbestos waste every time the wearer exits from the workspace to the outside through the decontamination facility.
- L. Respirators, disposable coveralls, head covers and foot covers shall be provided by the asbestos abatement contractor for the Facilities Representative, Construction Project Manager and any other authorized representative who may inspect the Work Area. Provide two respirators and six respirator filter changes per day.

### 1.17 AIR MONITORING - ASBESTOS ABATEMENT CONTRACTOR

- A. Asbestos abatement contractor shall employ a qualified industrial hygiene laboratory to analyze air samples in accordance with OSHA Regulations, 1926.1101 (Asbestos Standards for Construction) and New York City regulations.
- B. The industrial hygiene laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory identification number shall be submitted and approved by the City. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).
- C. Industrial hygiene laboratory shall also be a current proficient participant in the NIST/NVLAP Quality Assurance Program for the identification of bulk samples. Laboratory identification number shall be submitted to and approved by the City.
- D. Air monitoring responsibilities for the asbestos abatement contractor's employees, shall be performed by a representative of the industrial hygiene laboratory retained by the asbestos abatement contractor.



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- E. Asbestos abatement contractor shall submit to the City all credentials of the designated (as defined in OSHA 1926.1101) and industrial hygiene laboratory representative for approval.
- F. Air monitoring and inspection shall be conducted by the Asbestos abatement contractor's competent person (as defined in OSHA 1926.1101).
- G. Continuous (daily or per shift) monitoring and inspection will include Work Area samples, personnel samples from the breathing zone of a worker to accurately determine the employees' 8-hour TWA (unless Type C respirators are used) and decontamination unit clean room samples.
- H. Work Area samples and employee personnel samples shall be taken using pumps whose flow rates can be determined to an accuracy of +5-percent, at a minimum of two liters per minute. This must be demonstrated at the job site.
- I. Sampling and analysis methods shall be per NIOSH 7400A.
- J. Test Reports:
  - 1. Promptly process and distribute one copy of the test results, to the Commissioner.
  - 2. Prompt reports are necessary so that if required, modifications to work methods and/or practices may be implemented as soon as possible.
  - 3. Asbestos abatement contractor shall by facsimile notify the Commissioner within 24 hours of the results of each test, followed by written notification within three days.
- K. Competent person shall conduct inspections and provide written reports daily. Inspections will include checking the standard operating procedures, engineering control systems, respiratory protection and decontamination systems, packaging and disposal of asbestos waste, and any other aspects of the project which may affect the health and safety of the people and environment.
- L. All costs for required air monitoring by the asbestos abatement contractor's competent person shall be borne by the asbestos abatement contractor.
- M. The City reserves the right to conduct air and surface dust sampling in conjunction with and separate from the Third-Party Air Monitor for the purposes of Quality Assurance.
- N. All samples shall be accompanied by a Chain of Custody Record that shall be submitted to the Construction Project Manager upon completion of analysis.

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### 1.18 THIRD PARTY MONITORING AND LABORATORY

- A. The NYCDDC, at its own expense, will employ the services of an independent Third Party Air Monitoring Firm and Laboratory. The Third Party Air Monitor will perform air sampling activities and project monitoring at the Work Site.
- B. The Laboratory will perform analysis of air samples utilizing Phase Contrast Microscopy (PCM) and/or Transmission Electron Microscopy (TEM). This laboratory shall meet the standards stated in Paragraph 1.17. B.
- C. Observations will include, but not be limited to, checking the standard operating procedures, engineering control systems, respiratory protection, decontamination systems, packaging and disposal of asbestos waste, and any other aspects of the project that may affect the health and safety of the environment, Asbestos abatement contractor, and/or facility occupants.
- D. The Third Party Air Monitoring Firm and the designated Project Monitor shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the asbestos abatement contractor to verify that said performance complies with this Specification. The Third-Party Air Monitor shall be on site throughout the entire abatement operation.
- E. The NYCDDC will be responsible for costs incurred with the Third Party Air Monitoring Firm and laboratory work. Any subsequent additional testing required due to limits exceeded during initial testing shall be paid for by the Asbestos abatement contractor.
- F. At a minimum, air sampling shall be conducted in accordance with the following schedule:

Abatement Activity	Pre-Abatement	During Abatement	Post-Abatement
Equal to or greater than 10,000 square feet or 10,000 linear feet of ACM	PCM	PCM	TEM
Less than 10,000 square feet or 10,000 linear feet of ACM	PCM	PCM	PCM

Note: TEM is acceptable wherever PCM is required.

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- G. The number of air samples required per stage of abatement and size of abatement project is listed in the table below:

		Pre-Abatement	During Abatement	Post Abatement
Large Asbestos Projects				
1.	Full Containment	10	5	10
2.	Glovebag inside Tent	5 <sup>a</sup>	5 <sup>a</sup>	5 <sup>a</sup>
3.	Exterior Foam and Vertical Surfaces	-	5 <sup>c</sup>	5 <sup>d</sup>
4.	Interior Foam	10	5 <sup>c</sup>	10 <sup>d</sup>
Small Asbestos Projects				
1.	Full Containment	6	3	6
2.	Glovebag inside Tent	3 <sup>b</sup>	3 <sup>b</sup>	3 <sup>b</sup>
3.	Tent	3 <sup>b</sup>	3 <sup>b</sup>	3 <sup>b</sup>
4.	Exterior Foam and Vertical Surfaces	-	3 <sup>c</sup>	3 <sup>d</sup>
5.	Interior Foam	6	3 <sup>c</sup>	6 <sup>d</sup>
Minor Projects				
1.	Glovebag inside Tent	-	-	1 <sup>d</sup>
2.	Tent	-	-	1 <sup>d</sup>
3.	Exterior Foam and Vertical Surfaces	-	-	1 <sup>d</sup>
4.	Interior Foam	-	-	1 <sup>d</sup>

Notes:

- a. if more than three (3) tents then two (2) samples required per enclosure.
- b. if more than three (3) tents then one (1) sample required per enclosure.
- c. samples shall be taken within the work area(s).
- d. area sampling is required only if:
  - visible emissions are detected during the project
  - during-abatement area sampling results exceeded 0.01 f/cc or the pre-abatement area sampling result(s) for interior projects where applicable.
  - work area to be reoccupied is an interior space at a school, healthcare, or daycare facility.

- H. Prior to commencement of abatement activities, the Third Party Air Monitoring Firm will collect a minimum number of area samples inside each homogeneous work area.

1. Samples will be taken during normal occupancy activities and circumstances at the work site.

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2. Samplers shall be located within the proposed work area and at all proposed isolation barrier locations.
  3. Samples shall be analyzed using PCM.
  4. The number of samples to be collected will be determined by the size of the project and the abatement methods to be utilized.
- I. Frequency and duration of the air sampling during abatement shall be representative of the actual conditions during the abatement. The size of the asbestos project will be a factor in the number of samples required to monitor the abatement activities. The following minimum schedule of samples shall be required daily.
1. For large asbestos projects employing full containment, area air sampling shall be performed at the following locations:
    - a. Two area samples outside the work area in uncontaminated areas of the building, remote from the decontamination facilities.
      - (1) Primary location selection shall be within 10 feet of isolation barriers.
      - (2) Where negative ventilation exhaust runs through uncontaminated building areas, one of the area samples will be required in these areas to monitor any potential fiber release.
      - (3) Where exhaust tubes have been grouped together in banks of up to five (5) tubes, with each tube exhausting separately and the bank of tubes terminating together at the same controlled area, one area air sample shall be taken.
    - b. One area sample within the uncontaminated entrance to each decontamination enclosure system.
    - c. Where adjacent non-work areas do not exist, an exterior area sample shall be taken.
    - d. One area sample within 5 feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors but not within a duct.
    - e. One area sample outside, but within 25 feet of, the building or structure, if the entire building or structure is the work area.

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2. For large asbestos projects involving interior foam method, area air sampling shall be performed at the following sampling locations:
  - a. One area sample taken outside the work area within 10 feet of isolation barriers.
  - b. One area sample taken within the uncontaminated entrance to each worker decontamination and waste decontamination enclosure system.
  - c. One area sample within 5 feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors but not within a duct, if applicable.
  - d. Three area samples inside the work area.
  - e. One area sample where the negative ventilation exhaust ducting runs through uncontaminated building areas, if applicable.
3. For large asbestos projects employing the glovebag procedure within a tent, a minimum of five continuous air samples shall be taken concurrently with the abatement for each work area, unless there are more than three enclosures, in which case two area samples per enclosure are required.
  - a. Four area samples taken outside the work area within ten feet of tent enclosure(s).
  - b. One area sample taken within the uncontaminated entrance to each worker and waste decontamination enclosure system.
  - c. One area sample within five feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors, but not within a duct, if applicable.
  - d. One area sample where negative ventilation exhaust ducting runs through uncontaminated building areas, if applicable.
4. For large asbestos projects involving exterior foam method or removal of ACM from vertical surfaces, a minimum of five continuous area samples shall be taken concurrently with the abatement for each work area using the following minimum requirements:
  - a. Three area samples inside the work area and remote from the decontamination systems.

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- b. One area sample within the uncontaminated entrance to each worker and waste decontamination enclosure system.
    - c. One area sample outside the work area within 25 feet of the building or structure, if the entire building or structure is the work area.
    - d. One area sample inside the building or structure at the egress point to the work area, if applicable.
  5. For small asbestos projects employing full containment, a minimum of three continuous area samples shall be taken concurrently with the abatement for each work area at the following locations:
    - a. Two area samples taken outside the work area within ten feet of the isolation barriers.
    - b. One area sample within the uncontaminated entrance to each worker or waste decontamination enclosure system.
    - c. One area sample within five feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors, but not within a duct, if applicable.
    - d. One area sample where negative ventilation exhaust ducting runs through an uncontaminated building area, if applicable.
  6. Tent Procedures:

For projects involving more than 25 linear feet or 10 square feet, a minimum of three continuous samples shall be taken concurrently throughout abatement.
- J. Post-abatement clearance air monitoring for projects not solely employing glove-bag procedures shall include a minimum number of area samples inside each homogeneous work area and outside each homogeneous work area (five samples inside/five samples outside for Large Projects and three samples inside/three samples outside for Small Projects). In addition to the five sample inside/five sample outside minimum for Large Projects, one additional representative area sample shall be collected inside and outside the work area for every 5,000 square feet above 25,000 square feet of floor space where ACM has been abated.
- K. Post-abatement clearance air monitoring for Small Projects solely employing glove-bag procedures is not required unless one or more of the following events occurs. In such cases, post-abatement clearance air monitoring procedures shall be followed. The events requiring post-abatement clearance air monitoring are:
  1. The integrity of the glove-bag was compromised,

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2. Visible emissions are detected outside the glove-bag, and/or
  3. Ambient levels exceed 0.01 f/cc during abatement.
- L. Monitoring requirements for other than post-abatement clearance air monitoring are as follows:
1. The sampling zone for indoor air samples shall be representative of the building occupants' breathing zone.
  2. If possible, outdoor ambient and baseline samplers should be placed about 6 feet above the ground surface in reasonable proximity to the building and away from obstructions and drafts that may unduly affect airflow.
  3. For outdoor samples, if access to electricity and concerns about security dictate a rooftop site, locations near vents and other structures on the roof that would unduly affect airflow shall be avoided.
  4. Air sampling equipment shall not be placed in corners of rooms or near obstructions such as furniture.
  5. Samples shall have a chain of custody record.
- M. Area air sampling during abatement shall be conducted as specified in the following documents except as restricted or modified herein:
1. Measuring Airborne Asbestos Following an Abatement Action, US EPA document 600/4-85-049 (Nov., 1985);
  2. Guidance for Controlling Asbestos-Containing Materials in Buildings; US EPA Publication 560/5-85-024 (June, 1984);
  3. Methodology for the Measurement of Airborne Asbestos by Electron Microscopy US EPA Contract No. 68-02-3266;
  4. Mandatory and non-mandatory Electron Microscopy Methods set forth in 40 CFR Part 763, Subpart E, Appendix A.
  5. NIOSH 7400 method using "A" counting rules

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N. In accordance with the above criteria, area samples (see NYCDEP Asbestos Control Program Regulations) shall conform to the following schedule:

Area Samples for Analysis by	Minimum Volume	Flow Rate
PCM, 25mm cassettes	560 liters	5 to 15 liters/minute
TEM, 25mm cassettes	560 liters	1 to 10 liters/minute
TEM, 37mm cassettes	1,250 liters	1 to 10 liters/minute

O. Post-abatement clearance air monitoring requirements are as follows:

1. Sampling shall not begin until at least one hour after wet cleaning has been completed and no visible pools of water or condensation remain.
2. Samplers shall be placed at random around the work area. If the work area contains the number of rooms equivalent to the number of required samples based on floor area, a sampler shall be placed in each room. When the number of rooms is greater than the required number of samples, a representative sample of rooms shall be selected.
3. The representative samplers placed outside the work area but within the building shall be located to avoid any air that might escape through the isolation barriers and shall be approximately 50 feet from the entrance to the work area, and 25 feet from the isolation barriers.

P. The following aggressive sampling procedures shall be used within the work area during all clearance air monitoring:

1. Before starting the sampling pumps, use forced air equipment (such as a one horsepower leaf blower) to direct exhaust air against all walls, ceilings, floors, ledges and other surfaces in the work area. This pre-sampling procedure shall take at least five minutes per 1,000 square feet of floor area; then
2. Place a 20-inch diameter fan in the center of the room. Use one fan per 10,000 cubic feet of room space. Place the fan on slow speed and point it toward the ceiling.
3. Start the sampling pumps and sample for the required time or volume.
4. Turn off the pump and then the fan(s) when sampling is completed.



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5. Collect a minimum number of area samples inside and outside each homogeneous work area (five inside/five outside samples for Large Projects and three inside/three outside samples for Small Projects). In addition to the minimum for Large Projects, one representative area samples shall be collected inside and outside the work area for every 5,000 square feet above 25,000 square feet of floor space where ACM has been abated.

Q. For post-abatement monitoring, area samples shall conform to the following schedule:

Area Samples for Analysis by	Minimum Volume	Flow Rate
PCM	1,800 liters	5 to 15 liters/minute
TEM	1,250 liters	1 to 10 liters/minute

1. Each homogeneous work area that does not meet the clearance criteria shall be thoroughly re-cleaned using wet methods, with the negative pressure ventilation system in operation. New samples shall be collected in the work area as described above. The process shall be repeated until the work site meets the clearance criteria.
2. For an asbestos project with more than one homogeneous work area, the release criterion shall be applied independently to each work area.
3. Should airborne fiber concentrations exceed the clearance criteria, the asbestos abatement contractor shall re-clean the work area utilizing wet wiping and HEPA-vacuumping techniques. Following completion of re-cleaning activities, the Third-Party Air Monitor will perform an observation of the Work Area. If the Third-Party Air Monitor determines that the work was performed in accordance with the specifications, the appropriate settling period will be observed and additional air sampling will be performed.
4. All costs resulting from additional air tests and observations shall be borne by the asbestos abatement contractor. These costs may include, but are not limited to, labor, analysis fees, materials, and expenses.
5. After the area has been found to be in compliance, the asbestos abatement contractor may remove Isolation Barriers and perform final cleaning as specified.

R. Clearance and/or Re-occupancy Criteria:

1. The clearance criteria shall be applied to each homogeneous work area independently.

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2. For PCM analysis, the clearance air monitoring shall be considered satisfactory when each of the 5 inside/5 outside samples for Large Projects and/or 3 inside/3 outside samples for Small Projects is less than or equal to 0.01 f/cc or the background concentrations, whichever is greater.
3. For TEM analysis, the clearance air monitoring shall be considered satisfactory when the requirements stated in 40 CFR Part 763, Subpart E, Appendix A, Section IV are met.
4. As soon as the air monitoring tests are completed, the Third-Party Air Monitor will send the results of such tests to the City and notify the Asbestos abatement contractor.
5. The asbestos abatement contractor shall initiate the appropriate closeout information into the DEP ARTS database within 24 hours of work area completion to allow the Third Party Air Monitoring Firm to complete and submit the ACP-15 forms for each specific work area.
6. The asbestos abatement contractor shall provide the ACP-20 and ACP-21 forms to the Third Party Air Monitoring Firm within 48 hours of receipt.

### 1.19 TAMPERING WITH TEST EQUIPMENT

All parties to this Contract are hereby notified that any tampering with testing equipment will be considered an attempt at falsifying reports and records to federal and state agencies and each offense will be prosecuted under applicable state and federal criminal codes to the fullest extent possible.

### 1.20 GUARANTEE

- A. Work performed in compliance with this Contract shall be guaranteed for a period of one year from the date the completed work is accepted by the City.
- B. The asbestos abatement contractor shall not be held liable for the guarantee where the repair required under the guarantee is a result of obvious abuse or vandalism, as determined by the Commissioner.
- C. The City will notify the asbestos abatement contractor in writing regarding defects in work under the guarantee.

## PART 2 – PRODUCTS

### 2.01 MATERIAL HANDLING

- A. Deliver all materials to the job site in their manufacturer's original container, with the manufacturer's label intact and legible.

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1. Maintain packaged materials with seals unbroken and labels intact until time of use.
  2. Store all materials on pallets, away from any damp and/or wet surface. Cover materials in order to prevent damage and/or contamination.
  3. Promptly remove damaged materials and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the City.
- B. The Construction Project Manager may reject as non-complying such material and products that do not bear identification satisfactory to the Construction Project Manager as to manufacturer, grade, quality and other pertinent information.

### 2.02 MATERIALS

- A. Wetting agents: (Surfactant) shall consist of resin materials in a water base, which have been tested to ensure materials are non-toxic and non-hazardous. Surfactants shall be installed according to the manufacturer's written instructions.
- B. Encapsulants: Liquid material which can be applied to asbestos-containing material which temporarily controls the possible release of asbestos fibers from the material or surface either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.
- C. During abatement activities, replacement materials shall be stored outside the work area in a manner to prevent contamination. Materials required for the asbestos project (i.e., plastic sheeting, replacement filters, duct tape, etc.) shall be stored to prevent damage or contamination.
- D. Framing Materials and Doors: As required to construct temporary decontamination facilities and isolation barriers. Lumber shall be high grade, new, finished one side and fire retardant.
- E. Fire Retardant Polyethylene Sheeting: minimum uniform thickness of 6-mil. Provide largest size possible to minimize seams. All materials used in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.
- F. Fire Retardant Reinforced Polyethylene Sheeting: For covering floor of decontamination units, provide translucent, nylon reinforced or woven polyethylene laminated, fire retardant polyethylene sheeting. Provide largest size possible to minimize seams, minimum uniform thickness 6-mil. All materials used

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in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.

- G. Drums: Asbestos-transporting drums, sealable and clearly marked with warning labels as required by OSHA and EPA.
- H. Polyethylene Disposal Bags: Asbestos disposal bags, minimum of fire retardant 6-mil thick. Bags shall be clearly marked with warning labels as required by OSHA and EPA.
- I. Signs: Asbestos warning signs for posting at perimeter of Work Area, as required by OSHA and EPA.
- J. Waste Container Bag Liners and Flexible Trailer Trays: One piece leak-resistant flexible tray with absorbent pad.
- K. Tape: Provide tape which is of high quality with an adhesive that is formulated to aggressively stick to sheet polyethylene.
- L. Spray Adhesive: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- M. Flexible Duct: Spiral reinforced flex duct for air filtration devices.
- N. Protective Clothing: Workers shall be provided with sufficient sets of properly fitting, full-body, disposable coveralls, head covers, gloves, and 18-inch high boot-type foot covers. Protective clothing shall conform to OSHA Standard 29 CFR 1926.1101.
- O. Surfactants, strippers, sealers, or any other chemicals used shall be non-carcinogenic and non-toxic.
- P. Materials used in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.

### 2.03 TOOLS AND EQUIPMENT

- A. Air Filtration Device (AFD): AFDs shall be equipped with High Efficiency Particulate Air (HEPA) filtration systems and shall be approved by and listed with Underwriter's Laboratory.
- B. Scaffolding: All scaffolding shall be designed and constructed in accordance with OSHA (29 CFR 1926/1910), New York City Building Code, and any other applicable federal, state and local government regulations. Whenever there is a conflict or overlap of the above references the most stringent provisions are applicable. All scaffolding and components shall be capable of supporting without failure a minimum of four times the maximum intended load, plus an allowance

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for impact. All scaffolding and staging must be certified in writing by a Professional Engineer licensed to practice in the State of New York.

1. Equip rungs of all metal ladders, etc., with an abrasive, non-slip surface.
  2. Provide non-skid surface on all scaffold surfaces subject to foot traffic. Scaffold ends and joints shall be sealed with tape to prevent penetration of asbestos fibers.
- C. **Transportation Equipment:** Transportation Equipment, as required, shall be suitable for loading, temporary storage, transit and unloading of asbestos contaminated waste without exposure to persons or property. Any temporary storage containers positioned outside the building for temporary storage shall be metal, closed and locked.
- D. **Vacuum Equipment:** All vacuum equipment utilized in the Work Area shall utilize HEPA filtration systems.
- E. **Vacuum Attachments:** Soft Brush Attachment, Asbestos Scraper Tool, Drill Dust Control Kit.
- F. **Electric Sprayer:** An electric airless sprayer suitable for application of encapsulating material and shall be approved by and listed with Underwriters Laboratory.
- G. **Water Sprayer:** The water sprayer shall be an airless or other low-pressure sprayer for amended water application.
- H. **Water Atomizer:** Powered air-misting device equipped with a ground fault interrupter and equipped to operate continuously.
- I. **Brushes:** All brushes shall have nylon bristles. Wire brushes are excluded from use due to their potential to shred asbestos fibers into small, fine fibers. Wire brushes maybe used for cleaning pipe joints within glove-bags upon written approval of the Construction Project Manager.
- J. **Power tools used to drill, cut into, or otherwise disturb ACM shall be manufacturer-equipped with HEPA filtered local exhaust ventilation. Abrasive removal methods, including the use of beadblasters, are prohibited.**
- K. **Other Tools and Equipment:** Asbestos abatement contractor shall provide other suitable tools for the stripping, removal, encapsulation, and disposal activities including but not limited to: hand-held scrapers, sponges, rounded-edge shovels, brooms, and carts.

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- L. Fans and Leaf Blower: Provide Leaf Blower (one leaf blower per floor) and one 20-inch diameter fans for each 10,000 cubic feet of Work Area volume to be used for aggressive sampling technique for clearance air testing.
- M. Fire Extinguishers: At least one fire extinguisher with a minimum rating 2-A:10-B:C shall be required for each work place. In the case of large asbestos projects, at least two such fire extinguishers shall be required.
- N. First Aid Kits: Asbestos abatement contractor shall maintain adequately stocked first aid kits in the clean rooms of the decontamination units and within Work Areas. The first aid kit shall be approved by a licensed physician for the work to be performed under this Contract.
- O. Water Service:
  - 1. Temporary Water Service Connection: All connections to the Facilities water system shall include back flow protection. Valves shall be temperature and pressure rated for operation of the temperature and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping, and equipment. Leaking or dripping fittings/valves shall be repaired and or replaced as required.
  - 2. Water Hoses: Employ new heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each Work Area and to each Decontamination Enclosure Unit. Provide fittings as required for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment.
  - 3. Water Heater: Provide UL rated 40-gallon electric water heaters to supply hot water for Personal Decontamination Enclosure System Shower. Activate from 30 Amp Circuit breakers located within the Decontamination Enclosure sub panel. Provide relief valve compatible with water heater operations, pipe relief valve down to drip pan at floor level with type 'L' copper piping. Drip pans shall be 6-inch deep and securely fastened to water heater. Wiring of the water heater shall comply with NEMA, NECA, and UL standards.
- P. Electrical Service:
  - 1. General: Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service.
  - 2. Temporary Power: Provide service to decontamination unit sub panel with minimum 60 AMP, two pole circuit breaker or fused disconnect connected to the building's main distribution panel. Sub panel and disconnect shall be

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sized and equipped to accommodate all electrical equipment required for completion of the work.

3. Voltage Differences: Provide identification warning signs at power outlets that are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided where required to provide voltages necessary for work operations.
4. Ground Fault Protection: Equip all circuits for any purpose entering Work Area with ground fault circuit interrupters (GFCI). Locate the GFCIs outside the Work Area so that all circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for all circuits to be used for any purpose in Work Area, decontamination units, exterior, or as otherwise required by NEC, OSHA or other authority.
5. Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead, and rise vertically where wiring will be least subject to damage from operations.
6. Temporary Wiring: In the Work Area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance. Provide liquid tight enclosures or boxes for all wiring devices. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors.
7. Electrical Power Cords: Use only grounded extension cords; use hard service cords where exposed to traffic and abrasion. Use single lengths of cords only.
8. Temporary Lighting: All lighting within the Work Area shall be liquid and moisture proof and designed for the use intended.
  - a. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting.
  - b. Provide lighting in the Decontamination Unit as required to supply a minimum 50-foot candle light level.
9. If electrical circuits, machinery, and other electrical systems in or passing through the work area must stay in operation due to health and safety requirements, the following precautions must be taken:
  - a. All unprotected cables, except low-voltage (less than 24 volts) communication and control system cables, panel boxes of cables and joints in live conduit that run through the work area shall be covered

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with three (3) independent layers of six (6) mil fire retardant polyethylene. Each layer shall be individually duct taped and sealed. All three (3) layers of polyethylene sheeting shall be left in place until satisfactory clearance air sampling results have been obtained.

### 2.04 CLEANING

- A. Throughout the construction period, the asbestos abatement contractor shall maintain the building as described in this Section.
1. The asbestos abatement contractor shall prevent building areas other than the Work Area from becoming contaminated with asbestos-containing dust or debris. Should areas outside the Work Area become contaminated with asbestos-containing dust or debris as a consequence of the asbestos abatement contractor's work practices, the asbestos abatement contractor shall be responsible for cleaning these areas in accordance with the procedures appended in Title 15, Chapter 1 of RCNY and NYSDOL ICR56. All costs incurred in cleaning or otherwise decontaminating non-Work Areas and the contents thereof shall be borne by the asbestos abatement contractor at no additional cost to the City.
  2. The asbestos abatement contractor shall provide to all personnel and laborers the required equipment and materials needed to maintain the specified standard of cleanliness.
- B. General
1. Waste water from asbestos removal operations, including shower water, may be discharged into the public sewer system only after approved filtration is on operation to remove asbestos fibers.
  2. Asbestos wastes shall be double bagged in six mil (.006") fire retardant polyethylene bags approved for ACM disposal and shall be properly labeled and handled before disposal.
  3. All waste generated shall be bagged, wrapped or containerized immediately upon removal. The personal and waste decontamination enclosure systems and floor and scaffold surfaces shall be HEPA vacuumed and wet cleaned at the end of each work shift at a minimum.
  4. The asbestos abatement contractor shall use corrugated cartons or drums for disposal of asbestos-containing waste having sharp edged components (e.g., nails, screws, metal lathe and tin sheeting) that may tear polyethylene bags and sheeting. The waste within the drums or cartons must be double bagged.



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5. The asbestos abatement contractor shall transport all bags of waste to disposal site in thirty gallon capacity metal or fiber drums with tight lids, or in locked steel dumpster.
6. Dumping of debris, waste or bagged waste will not be permitted.
7. The waste decontamination enclosure system shall be wet cleaned twice using wet cleaning methods upon completion of waste removal. When the worker decontamination enclosure shower room alternates as a waste container wash room, the shower room shall be washed immediately with cloths or mops saturated with a detergent solution prior to wet cleaning.
8. Excessive water accumulation or flooding in the work area shall require work to stop until the water is collected and disposed of properly.
9. ACM shall be collected utilizing rubber dust pans and rubber squeegees.
10. HEPA vacuums shall not be used on wet materials unless specifically designed for that purpose.
11. Metal shovels shall not be used within the work area.
12. Mastic solvent when used will be applied in moderation (e.g., by airless sprayer). Saturation of the concrete floor with mastic solvent must be avoided.
13. The asbestos abatement contractor shall retain all items in the storage area in an orderly arrangement allowing maximum access, not impeding traffic, and providing the required protection of all materials.
14. The asbestos abatement contractor shall not allow accumulation of scrap, debris, waste material, and other items not required for use in this work. When asbestos contaminated waste must be kept on the work site overnight or longer, it shall be double bagged and stored in accordance with New York City Department of Sanitation (NYCDOS) regulation Title 16 Chapter 8, and Federal, State and City laws.
15. At least twice a week (more if necessary), the asbestos abatement contractor shall completely remove all scrap, debris and waste material from the job site.
16. The asbestos abatement contractor shall provide adequate storage space for all items awaiting removal from the job site, observing all requirements for fire protection and concerns for the environment.
17. All respiratory protection equipment shall be selected from the latest NIOSH Certified Equipment list.

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18. Daily and more often, if necessary, the asbestos abatement contractor shall inspect the Work Areas and adjoining spaces, and pick up all scrap, debris, and waste material. All such items shall be removed to the place designated for their storage.
19. Weekly, and more often, if necessary, the asbestos abatement contractor shall inspect all arrangements of materials stored on the site; re-stack and tidy them or otherwise service them to meet the requirements of these Specifications.
20. The asbestos abatement contractor shall maintain the site in a neat and orderly condition at all times.

### PART 3 – EXECUTION

#### 3.01 WORKER DECONTAMINATION FACILITY

##### A. Large Asbestos Projects (Small Project Option):

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas
  - a. Structure:
    - (1) Use modular systems or build using wood or metal frame studs, joists, and rafters placed at a maximum of 16 inches on-center.
    - (2) When worker decontamination unit is located outdoors, in areas with public access, or in correctional facilities, frame work shall be lined with minimum 3/8" thickness fire rated plywood sheathing. Sheathing shall be caulked or taped airtight at all joints and seams.
    - (3) Interior shall be covered with two layers of fire retardant 6-mil polyethylene sheeting, with a minimum overlap of 12 inches at seams. Seal seams airtight using tape and adhesive. The interior floor shall be covered with two (2) layers of reinforced fire-retardant polyethylene sheeting with a minimum overlap on the walls of twelve inches.
    - (4) Entrances to the decontamination unit shall be secured with lockable hinged doors. Doors shall be open at all times when abatement operations are in progress. Doors shall be louvered

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to allow for air movement through the decontamination units into Work Area.

- b. **Curtained Doorways:** A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.
- c. **Air Locks:** Air locks shall consist of two curtained doorways placed a minimum of three feet apart.
- d. **Decontamination Enclosure System** shall be placed adjacent to the Work Area and shall consist of three totally enclosed chambers, separated from Work Area and each other by airlocks, as follows:
  - (1) **Equipment Room:** The equipment room shall have a curtain doorway to separate it from the Work Area, and share a common airlock with the shower room. The equipment room shall be large enough to accommodate at least one worker (allowing them enough room to remove their protective clothing and footwear), and a fire retardant 6-mil disposal bag for collection of discarded clothing and equipment. The equipment room shall be utilized for the storage of equipment and tools after decontamination using a HEPA-vacuum and/or wet cleaning. A one-day supply of replacement filters, in sealed containers, for HEPA-vacuums and negative air machines, extra tools, containers of surfactant, and other materials and equipment required for the project shall be stored here. A walk-off pan filled with water shall be placed in the Work Area just outside the equipment room for persons to clean foot coverings when leaving the Work Area. Contaminated footwear and reusable work clothing shall be stored in this room.
  - (2) **Shower Room:** The shower room shall have two airlocks (one that separates it from the equipment room and one that separates it from the clean room). The shower room shall contain at least one shower, with hot and cold water adjustable at the tap, per six workers. Careful attention shall be given to the shower to ensure against leaking of any kind and shall contain a rigid catch basin at least six inches deep. Asbestos abatement contractor shall supply towels, shampoo and liquid soap in the shower room at all times. Shower water shall be continuously drained, collected, and filtered through a system with at least a 5-micron particle size collection capacity. A system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filters by large particles. Pumps shall be installed, maintained

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and utilized in accordance with manufacturer's recommendations. Filtered water shall be discharged in accordance with applicable codes. Contaminated filters shall be disposed of as asbestos waste.

- (3) Clean Room: The clean room shall share a common airlock with the shower room and shall have a curtained doorway to separate it from outside non-contaminated areas. Lockers, for storage of workers' street clothing, and shelves, for storing respirators, shall be provided in this area. Clean disposable clothing, replacement filters for respirators, and clean dry towels shall be provided in the clean room. The clean room shall not be used for the storage of tool, equipment or other materials.

### B. Small Asbestos Projects:

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas.
2. The worker decontamination enclosure system shall consist of, as a minimum, an equipment room, a shower room, and a clean room separated from each other and from the work area by curtained doorways. The equipment storage, personnel gross decontamination and removal of disposal clothing shall occur in the equipment room prior to entering the shower. All other requirements shall be the same as described above for a large asbestos project.
3. For small asbestos projects with only one exit from the work area, the shower room may be used as a waste washroom. The clean room shall not be used for waste storage. All other requirements shall be the same as described above for a large asbestos project.

- C. Decontamination Enclosure System Utilities: Lighting, heat, and electricity shall be provided as necessary by the Asbestos abatement contractor, and as specified herein.

## 3.02 WASTE DECONTAMINATION FACILITY

### A. Large Asbestos Project (Small Project Option)

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas.

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- a. Structure:
- (1) Use modular systems or build using wood or metal frame studs, joists, and rafters placed at a maximum of 16 inches on-center.
  - (2) When worker decontamination unit is located outdoors, in areas with public access, or in correctional facilities, frame work shall be lined with minimum 3/8" thickness fire rated plywood sheathing. Sheathing shall be caulked or taped airtight at all joints and seams.
  - (3) Interior walls shall be covered with two layers of fire retardant 6-mil polyethylene sheeting, with a minimum overlap of 12 inches at seams. Seal seams airtight using tape and adhesive. The interior floor shall be covered with two (2) layers of reinforced fire-retardant polyethylene sheeting with a minimum overlap on the walls of twelve inches.
  - (4) Entrances to the decontamination unit shall be secured with lockable hinged doors. Doors shall be open at all times when abatement operations are in progress. Doors shall be louvered to allow for air movement through the decontamination units into the Work Area.
- b. Curtained Doorways: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.
- c. Air Locks: Air locks shall consist of two curtained doorways placed a minimum of three feet apart.
- d. Decontamination Enclosure System shall be located outside the work area and attached to all locations through which ACM waste will be removed from the work area and shall consist of two totally enclosed chambers, separated from the Work Area and each other by airlocks, as follows:
- (1) Washroom: An equipment washroom shall have two air locks (one separating the unit from the Work Area and one common air lock that separates it from the holding area). The washroom shall have facilities for washing material containers and equipment. Gross removal of dust and debris from contaminated material containers and equipment shall be accomplished in the Work Area, prior to moving to the washroom.

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- (2) Holding Area: A holding area shall share a common air lock with the equipment washroom and shall have a curtained doorway to outside areas. A hinged, lockable door shall be placed at the holding area entrance to prevent unauthorized access into the Work Area.

### B. Small Asbestos Project:

1. The worker decontamination enclosure system shall consist of, as a minimum, an equipment room, a shower room, and a clean room separated from each other and from the work area by curtained doorways. The equipment storage, personnel gross decontamination and removal of disposal clothing shall occur in the equipment room prior to entering the shower. All other requirements shall be the same as described above for a large asbestos project.
2. For small asbestos projects with only one exit from the work area, the shower room may be used as a waste washroom. The clean room shall not be used for waste storage. All other requirements shall be the same as described above for a large asbestos project.

- C. Decontamination Enclosure System Utilities: Lighting, heat, and electricity shall be provided as necessary by the Asbestos abatement contractor, and as specified herein.

### 3.03 PERSONNEL ENTRANCE AND DECONTAMINATION PROCEDURES FOR REMOVAL OPERATIONS UTILIZING REMOTE DECONTAMINATION FACILITIES

- A. All individuals who enter the Work Area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall fully identify the facility, agents, asbestos abatement contractor(s), the project, each Work Area, and worker respiratory protection employed. The job supervisor shall be responsible for the maintenance of the log during the abatement activity. The log shall be submitted to the NYC DDC within 48 hours of request.
- B. Each worker shall remove street clothes in the clean room; wear two disposable suits, including gloves, hoods and non-skid footwear; and put on a clean respirator (with new filters) before entering the Work Area.
- C. Each worker shall, before leaving the Work Area or tent, clean the outside of the respirators and outer layer of protective clothing by wet cleaning and/or HEPA-vacuuming. The outer disposable suit shall be removed in the airlock prior to proceeding to the Worker Decontamination Unit. The inner disposable suit and respirator shall be wet wiped and HEPA vacuumed thoroughly before removing and prior to aggressive shower.

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- D. Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately.

### **3.04 PERSONNEL ENTRANCE AND DECONTAMINATION PROCEDURES FOR REMOVAL OPERATIONS UTILIZING ATTACHED DECONTAMINATION FACILITIES**

- A. All workers and authorized visitors shall enter the Work Area through the worker decontamination facility.
- B. All individuals who enter the Work Area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, asbestos abatement contractor(s), the project, each Work Area and worker respiratory protection employed. The site supervisor shall be responsible for the maintenance of the log during the abatement activity. The log shall be submitted to the NYC DDC within 48 hours of request.
- C. Each worker or authorized visitor shall, upon entering the job site, remove street clothes in the clean room and put on a clean respirator with filters, and clean protective clothing before entering the Work Area through the shower room and equipment room.
- D. Each worker or authorized visitor shall, each time he leaves the Work Area, remove gross contamination from clothing before leaving the Work Area; proceed to the equipment room and remove clothing except the respirator; still wearing the respirator, proceed to the shower room; clean the outside of the respirator with soap and water while showering; remove filters, wet them, and dispose of them in the container provided for that purpose; wash and rinse the inside of the respirator; and thoroughly shampoo and wash himself/herself.
- E. Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately. Disposable clothing of the type worn inside the Work Area is not permitted outside the Work Area.

### **3.05 MAINTENANCE OF DECONTAMINATION ENCLOSURE FACILITIES AND BARRIERS**

The following procedures shall be followed during abatement activities.

- A. All polyethylene barriers inside the work place and partitions constructed to isolate the Work Area from occupied areas shall be inspected by the asbestos handler supervisor at least twice per shift.

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- B. Smoke tubes shall be used to test the integrity of the Work Area barriers and the decontamination enclosure systems daily before abatement activity begins and at the end of each shift.
- C. Damage and defects in the decontamination enclosure system shall be repaired immediately upon discovery. The decontamination enclosure system shall be maintained in a clean and sanitary condition at all times.
- D. At any time during the abatement activity, if visible emissions are observed, or elevated asbestos fiber counts outside the Work Area are measured, or if damage occurs to barriers, abatement shall stop. The source of the contamination shall be located, the integrity of the barriers shall be restored and extended to include the contaminated area, and visible residue shall be cleaned up using appropriate HEPA-vacuuuming and wet cleaning.
- E. Inspections and observations shall be documented in the daily project log by the asbestos handler supervisor.
- F. The daily inspection to ensure that exits have been checked against exterior blockage or impediments to exiting shall be documented in the log book. If exits are found to be blocked, abatement activities shall stop until the blockage is cleared.

### 3.06 MODIFICATIONS TO HVAC SYSTEMS

- A. Shut down, isolate or seal, all existing HVAC units, fans, exhaust fans, perimeter convection air units, supply and/or return air ducts, etc., situated in, traversing or servicing the work zone.
- B. Seal all seams with duct tap. Wrap entire duct with a minimum of two layers of fire retardant 6-mil polyethylene sheeting. All shutdowns are to be coordinated with the Facility. Where systems must be maintained, i.e., traversing Work Areas to non-Work Areas, only supply ducts will be maintained, protect as described above. All returns must be blanked off in Work Area and adjacent areas, including floor above and below Work Area. When required Asbestos abatement contractor shall apply for a clarification from NYCDEP. The Asbestos abatement contractor shall implement the following engineering procedures:
  - 1. Maintenance of a positive pressure within the HVAC system of 0.01 inch water gauge (or greater) with respect to the ambient pressure outside the Work Area. The conditions for this system shall be maintained and be operational 24 hours per day from the initiation of Work Area preparation until successful final air clearance. Positive pressurization of HVAC system shall be applied only under the direction and control of professional engineer, or other knowledgeable licensed professional;



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2. The positive pressurization of the duct shall be tested, inspected and recorded both at the beginning and at the end of each shift;
  3. The positive pressurization shall be monitored using instrumentation which will provide a written record of pressurization and that will trigger an audible alarm, if the static pressure falls below the set value;
  4. The supply air fan and the supply air damper for the active positive-pressurized duct shall be placed in the manual "on" positions to prevent shutdown by fail-safe mechanisms;
  5. The return air fan and the return air dampers shall be shut down and locked-out;
  6. All the seams of the HVAC ducts that pass through the Work Area shall be sealed;
  7. The HVAC ducts that pass through the Work Area shall be covered with two (2) layers of fire retardant 6-mil polyethylene sheeting, and all seams and edges of both layers shall be sealed airtight;
  8. The supply air fans, return air fans, and all dampers servicing the Work Area itself shall be shut down and locked-out. All openings within the Work Area of supply and return air ducts shall be sealed with 3/8-inch fire rated plywood and two layers of fire retardant 6-mil polyethylene;
  9. When abatement occurs during periods while the HVAC system is shut down an alternative method of pressurization of the duct passing through the Work Area should be employed (e.g., by low-pressure "blowers", etc., directly coupled into the duct). Item #4 above shall be deleted and shall be replaced by the requirement to set the dampers of the HVAC duct in the manual closed positions, in order to effect pressurization.
- C. Asbestos abatement contractor to coordinate this item with the Facility and Construction Project Manager at the commencement of work. Where present HVAC systems (ducts) service an area and that air system cannot be shut down, asbestos abatement contractor shall isolate and seal the ducts, both supply and return, at the boundary of that zone.
1. To isolate, cap, or seal a duct, the asbestos abatement contractor shall remove insulation from duct (if necessary), then disconnect linkage to fold shut all fire dampers. Asbestos abatement contractor shall seal all edges and seams with caulk and duct-tape.
  2. Asbestos abatement contractor shall then cut existing duct and fold metal in and secure with approved fasteners. Asbestos abatement contractor shall caulk and duct-tape all seams and edges.

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3. All ducts shall then be completely wrapped and sealed with duct-tape and three (3) layers of reinforced polyethylene sheeting.
  4. All ducts shall be restored to original working order at the end of the project.
- D. Where present HVAC systems (ducts) service occupied areas (non-Work Areas), the Asbestos abatement contractor shall blank off the ducts.
1. To isolate or seal the return duct, the asbestos abatement contractor shall remove any insulation (if necessary) from the duct. Then disconnect linkage to fold shut all fire dampers and insert a fiberglass board within the duct. Asbestos abatement contractor shall seal all edges and seams with caulk, duct-tape and three (3) layers of reinforced polyethylene sheeting.
  2. All isolation of return ducts and any other activity that requires removal of ceiling by the asbestos abatement contractor shall be conducted under controls. Work is to be coordinated with the Construction Project Manager and the Facility and is described as follows:
    - a. Work shall occur as scheduled.
    - b. Horizontal surfaces near the blanking operations shall be protected with fire retardant 6-mil polyethylene sheeting.
    - c. Plastic drapes shall be used to enclose the immediate area.
    - d. Asbestos abatement contractor to position and operate air filtration devices and HEPA-vacuums in the area to clean space after blanking operations.
    - e. All personnel involved with this work shall receive personal protection (i.e., respirators and disposable suits).
- E. Upon loss of negative pressure or electric power, all work activities in an area shall cease immediately and shall not resume until negative pressure and/or electric power has been fully restored. When a power failure or loss of negative pressure lasts, or is expected to last, longer than thirty (30) minutes, the following sequence of events shall occur:
1. All make up air inlets shall be sealed airtight.
  2. All decontamination facilities shall be sealed airtight after evacuation of all personnel from the Work Area.
  3. All adjacent areas shall be monitored for potential fiber release upon discovery of and subsequently throughout, power failure.

**3.07 LOCKOUT OF HVAC SYSTEMS, ELECTRIC POWER, AND ACTIVE BOILERS**

Prior to the start of any prep work, the asbestos abatement contractor shall employ skilled tradesmen with limited asbestos licenses for the following work:

- A. Disable all ventilating systems or other systems bringing air into or exhausting air out of the Work Area. Disable system by disconnecting wires removing circuit breakers, by lockable switch or other positive means to ensure against accidental re-starting of equipment.
- B. Lock out power to the Work Area by switching off all breakers and removing them from panels or by switching and locking entire panel. Label panel with following notation: "DANGER CIRCUIT BEING WORKED ON". Give all keys to Facility.
- C. Lock out power to circuits running through Work Area whenever possible by switching off and removing breakers from panel. If circuits must remain live, the Facility shall notify asbestos abatement contractor in order that he may secure a variance from NYCDEP. The asbestos abatement contractor shall protect all conduit and wires to remain and label all active circuits at intervals not to exceed 3 feet with tags having the following notation: "DANGER LIVE ELECTROCUTION HAZARD". The asbestos abatement contractor shall label all circuits in all locations including hidden locations that may be affected by the work in a similar manner.
- D. All boilers and other equipment within the work area shall be shut down, locked out, tagged out and the burner/boiler/equipment accesses and openings shall be sealed until abatement activities are complete. If the boiler or other exhausted equipment will be subject to abatement, all breeching, stacks, columns, flues, shafts, and double-walled enclosures serving as exhausts or vents shall be segregated from the affected boiler or equipment and sealed airtight to eliminate potential chimney effects within the work area.

**PART 4 – PREPARATION OF WORK AREA AND REMOVAL PROCEDURES**

**4.01 REMOVAL OF ASBESTOS-CONTAINING MATERIAL**

- A. Asbestos abatement contractor Responsibility

Asbestos abatement contractor shall be responsible for the proper removal of ACM from the Work Area using standard industry techniques. The Third-Party Air Monitor representative shall observe the Work.

- 1. General Requirements:
  - a. Removal of ACM shall be performed using wet methods. Dry removal of ACM is prohibited.

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- b. Spray ACM with amended water with sufficient frequency and quantity to enhance penetration. Sufficient time shall be allowed for amended water to penetrate the material to the substrate prior to removal. All ACM shall be thoroughly wetted while work is being conducted.
- c. Accumulation of standing water on the floor of the Work Area is prohibited.
- d. Apply removal encapsulants, when used, in accordance with the manufacturer's recommendations and guidelines.
- e. Containerize ACM immediately upon detachment from the substrate. Alternately, ACM may be dropped in to a flexible catch basin and promptly bagged. Detached ACM is not permitted to lie on the floor for any period of time. Excess air within the bag shall be removed before sealing. ACM shall not be dropped from a height of greater than 10 feet. Above 10 feet, dust free inclined chutes may be used. Maximum inclination from horizontal shall be 60-degrees for all chutes.
- f. Exits from the work area shall be maintained, or alternative exits shall be established, in accordance with section 1027 of the New York City Fire Code. Exits shall be checked at the beginning and end of each work shift against blockage or impediments to exiting.
- g. Signs clearly indicating the direction of exits shall be maintained and prominently displayed within the work area.
- h. No smoking signs shall be maintained and prominently displayed within the work place.
- i. At least one fire extinguisher with a minimum rating 2-A:10-B:C shall be required for each work place. In the case of large asbestos projects, at least two such fire extinguishers shall be required.
- j. If the containment area of an asbestos project covers the entire floor of the affected building, or an area greater than 15,000 square feet on any given floor, the installation of a negative air cut off switch or switches shall be required at a single location outside the work place, such as inside a stairwell, or at a secured location in the ground floor lobby when conditions warrant. The required switch or switches shall be installed by a licensed electrician pursuant to a permit issued by the Department of Buildings. If negative pressure ventilation equipment is used on multiple floors the cut off switch shall be able to turn off the equipment on all floors.

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### B. Removal of ACM Utilizing Full Containment Procedures shall be as follows:

#### 1. Preparation Procedures:

- a. Ensure that the Third-Party Air Monitor has performed area monitoring and established a background count prior to the preparatory operations for each removal area, as applicable.
- b. Shut down, isolate, and lock out or tag heating, ventilating, and air conditioning (HVAC) systems which serve or which pass through the Work Area. Vents within the Work Area and seams in HVAC components shall be sealed with tape and two layers of fire retardant polyethylene sheeting. Filters in HVAC systems shall be removed and treated as asbestos-asbestos contaminated waste.
- c. Shut down, disconnect, and lock out or tag all electric power to the Work Area so that there is no possibility of its reactivation until after clearance testing of the Work Area.
- d. Provide and install decontamination enclosure systems in accordance with Sections 3.01 and 3.02 of this Section.
- e. Remove ACM that may be disturbed by the erection of partitions using tent procedures and wet removal methods. Removal shall be limited to a one-foot wide strip running the length/height of the partition.
- f. Pre-clean and remove moveable objects from the Work Area. Pre-cleaning shall be accomplished using HEPA-vacuum and wet-cleaning techniques. Store moveable objects at a location determined by the City.
- g. Protect carpeting that will remain in the Work Area.
  - (1) Pre-clean carpeting utilizing wet-cleaning techniques.
  - (2) Install a minimum of two layers of fire retardant 6-mil reinforced polyethylene sheeting over carpeting.
  - (3) Place a rigid flooring material, minimum thickness of 3/8-inch, over polyethylene sheeting.
- h. Pre-clean all fixed objects to remain within the Work Area using HEPA-vacuum and wet-cleaning techniques.

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- i. Seal fixed objects with two individual layers, minimum, of 6-mil fire retardant polyethylene sheeting.
- j. Pre-clean entire Work Area utilizing HEPA-vacuum and wet-cleaning techniques. Methods of cleaning that raise dust; such as dry sweeping or use of vacuum equipment not equipped with HEPA-filters, is prohibited.
- k. Install isolation barriers (i.e., sealing of all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grills, diffusers, and other penetrations within the Work Area) using two layers of 6-mil fire retardant polyethylene sheeting and duct-tape.
- l. Construct rigid framework to support Work Area barriers.
  - (1) Framework shall be constructed using 2-inch by 4-inch wooden or metal studs placed 16 inch on center when existing walls and/or ceiling do not exist for all openings greater than 32 square feet. Framework is not required except where one dimension is one foot or less or the opening will be used as an emergency exit.
  - (2) Apply a solid construction material, minimum thickness of 3/8-inch to the Work Area side of the framing. In secure interior areas, not subject to access from the public or building occupants, an additional layer of 6-mil fire retardant polyethylene sheeting may be substituted for the rigid construction material.
  - (3) Caulk all wall, floor, ceiling, and fixture joints to form a leak tight seal.
- m. Seal floor drains, sumps, shower tubs, and other collection devices with two layers of 6-mil fire retardant plastic and fire rated plywood, as necessary, and provide a system to collect all water used by the asbestos abatement contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer.
- n. Remove ceiling mounted objects not previously sealed that will interfere with removal operations. Mist object and surrounding ACM with amended water prior to removal to minimize fiber dispersal. Clean all moveable objects using HEPA-vacuum and wet-cleaning techniques prior to removal from the Work Area.

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- o. Fiberglass insulation with intact coverings shall be protected in place during abatement activities. These materials shall be protected with two layers of 6-mil fire retardant polyethylene sheeting as isolation barriers and two additional layers of 6-mil fire retardant polyethylene sheeting serving as primary and secondary surface barriers.
- p. Install and initiate operation of AFDs to provide a negative pressure and a minimum of four air changes per hour within the Work Area relative to surrounding non-Work Areas. Do not shut down AFDs until the Work Area is released to the City following final clearance procedures. The use of HEPA-filtered vacuum to produce a negative air pressure inside the enclosure is prohibited.
- q. Maintain emergency and fire exits from the Work Areas or establish alternative exits satisfactory to the local fire officials. Emergency exits and routes shall be established and clearly marked with florescent paint or other effective designations to permit easy location from anywhere within the Work Area. Cutting tools (e.g., knife, razor) shall be attached to the work area side of the sheeting for use in the event that the barrier must be cut open to allow egress. Emergency exits shall be secured to prevent access from uncontaminated areas and yet permit emergency exiting. Exits shall be checked daily against exterior blockage or impediments to exiting.
- r. Temporary lighting within the Work Area and decontamination system shall be provided as required to achieve minimum illumination levels.
- s. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacturer-equipped with HEPA filtered local exhaust ventilation.
- t. Prior to being plasticized, the Work Areas shall be cleaned using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall not be used.
- u. Plasticize the area after pre-cleaning, using the following procedures.
  - (1) Cover floors with one layer of 6-mil fire retardant polyethylene sheeting, turning layer a minimum of 6 inches up wall, and seal layer to wall.

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- (2) Cover walls with one layer of 6-mil fire retardant polyethylene sheeting, overlapping wall layer a minimum of 6 inches, and seal layer to floor layer.
  - (3) Cover floors with a second layer of 6-mil fire retardant polyethylene sheeting, turning layer a minimum of 12 inches up wall, and seal layer to wall.
  - (4) Cover walls with a second layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to floor layer.
  - (5) In areas where demolition is required to access ACM, a layer of fire retardant 6-mil reinforced polyethylene sheeting shall be placed on the floor of the enclosure.
  - (6) Perform demolition required to access ACM. Debris resulting from demolition activities shall be disposed of as ACM waste as described in this Specification.
  - (7) Repeat preparation of areas accessed by demolition activities as described above.
- v. Suspended ceiling tiles and T-grid components shall remain in place until the preparation of the Work Area below the ceiling tiles are completed and personnel and equipment decontamination enclosures have been constructed.
- w. Scaffolds shall be provided for workers engaged in work that cannot safely be performed from the ground or other solid Work Area surface.
- x. Means of egress shall not be obstructed by hardwall barriers.
- y. Pre-Removal Inspections.
- (1) Prior to removal of any ACM, the asbestos abatement contractor shall notify the Third-Party Air Monitor and request a pre-removal inspection. Posting of warning signs, building of decontamination enclosure systems, and all other preparatory steps have been taken prior to notification of the Third-Party Air Monitor.
  - (2) Asbestos abatement contractor shall correct any deficiencies observed by Third-Party Air Monitor at no additional cost to City.



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- (3) Following the Third-Party Air Monitor's approval of the Work Area preparations, removal of ACM may commence.
2. Removal of ACM Within Full Containment:
  - a. Mist material with amended water. Allow sufficient time for the amended water to penetrate the material to be removed.
  - b. Remove the material using hand tools such as scrapers or putty knives. Wire-mesh or wood lathe reinforcing, when present, shall be cut into manageable pieces and disposed of as ACM.
  - c. Remove any residual material from the substrate using wet cleaning methods and nylon-bristled hand brushes.
  - d. Place the removal material immediately into a properly labeled fire retardant 6-mil polyethylene bag. All material shall be properly containerized and decontaminated prior to removal from the Work Area.
  - e. Following the completion of removal of insulation, all visible residue shall be removed from the substrate.
3. Following Removal of ACM utilizing Full Containment Procedures:
  - a. First Cleaning:
    - (1) Remove any visible accumulation of asbestos material and debris. HEPA-vacuuming and wet cleaning shall be performed on all surfaces inside the Work Area. All sealed drums, plastic bags, and equipment used in the Work Area shall be removed from the Work Area.
    - (2) Upon request of the asbestos abatement contractor, the Third-Party Air Monitor will perform a visual inspection. Evidence of asbestos contamination identified during the inspection will necessitate further cleaning as heretofore specified.
    - (3) Remove first layer of plastic sheathing inside the Work Area. The isolation barriers and decontamination facility shall remain in place and be utilized.
  - b. Second Cleaning:
    - (1) After the first cleaning, the Work Area shall be vacated for twelve hours to allow fibers to settle.

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- (2) All objects and surfaces in the Work Area shall be HEPA - vacuumed and wet cleaned for a second cleaning.
- (3) A thin coat of lockdown encapsulant shall be applied to all plastic covered surfaces in the Work Area.
- (4) When the encapsulant is dry, second layer of polyethylene sheeting on the walls, ceiling and floors shall be removed. Do not remove seals from doors, windows, Isolation Barriers or disconnect the negative pressure equipment.

c. Third Cleaning:

- (1) A minimum of four hours after the second cleaning, all the surfaces in the Work Area shall be HEPA-vacuumed and wet cleaned for a third cleaning.
- (2) Upon the request of the asbestos abatement contractor, the Third-Party Air Monitor will do final visual inspection for re-occupancy. Evidence of asbestos contamination identified during the inspection will necessitate further cleaning as heretofore specified.
- (3) When the Work Area passes the Third-Party Air Monitor's visual re-occupancy inspection, air sampling shall not begin until at least one hour after the completion of the third cleaning. The Third-Party Air Monitor shall perform air monitoring using aggressive testing techniques. The Third-Party Air Monitor will approve re-occupancy if the specified fiber count in the Work Area is achieved according to the Third-Party Air Monitor.
- (4) When the Work Area passes the re-occupancy test, all controls and seals established shall be removed.
- (5) The cleaned layer of the surface barriers shall be removed from walls and floors.
- (6) The isolation barriers shall remain in place throughout cleanup. Decontamination enclosure systems shall remain in place and be utilized. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

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- d. Final Barrier Removal:
    - (1) Upon receipt of acceptable clearance testing results, polyethylene sheeting and Isolation Barriers shall be removed and disposed accordingly as asbestos-containing material.
    - (2) The area surrounding the abatement work place shall be cleaned of any visible debris utilizing HEPA vacuum and wet methods.
  - e. The Third-Party Air Monitor will conduct a final visual observation. Approval must be granted prior to break down of decontamination facility and asbestos abatement contractor demobilization.
- C. Removal of ACM utilizing NYCDEP Title 15, Chapter 1 §1-106 Tent Containment Procedures and/or Tent and Glove-bag Procedures utilizing NYDEP Title 15, Chapter 1 §1-105 shall be as follows:
1. Preparation Procedures:
    - a. Ensure that the Third-Party Air Monitor has performed area monitoring and established a background count prior to the preparatory operations for each removal area, as applicable.
    - b. Shut down, isolate, and lock out or tag heating, ventilating, and air conditioning (HVAC) systems which serve or which pass through the Work Area. Vents within the Work Area and seams in HVAC components shall be sealed with tape and two layers of polyethylene sheeting. Filters in HVAC systems shall be removed and treated as asbestos-asbestos contaminated waste.
    - c. Shut down, disconnect, and lock out or tag all electric power to the Work Area so that there is no possibility of its reactivation until after clearance testing of the Work Area.
    - d. Provide and install decontamination enclosure systems in accordance with PART 3 - EXECUTION, Sections 3.01 and 3.02 of these Specifications. Decontamination facilities may be remote from the Work Areas.
    - e. Construct rigid framework to support Work Area barriers. Framework shall be constructed using 2-inch by 4-inch wooden or metal studs placed 16 inch on center when existing walls and/or ceiling do not exist.

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- f. Seal floor drains, sumps, shower tubs, and other collection devices with two layers of fire retardant 6-mil plastic and minimum 3/8" fire rated plywood, as necessary, and provide a system to collect all water used by the asbestos abatement contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer. Any opening greater than 32 square feet shall be framed with 2-inch by 4-inch studding placed 16 inches on center.
- g. Install and initiate operation of AFDs to provide a negative pressure and a minimum of four air changes per hour and negative pressure of -0.02" of water column within the Work Area relative to surrounding non-Work Areas. Do not shut down AFDs until the Work Area is released to the City following final clearance procedures. The use of HEPA-filtered vacuums to produce a negative air pressure inside the enclosure is prohibited.
- h. Maintain emergency and fire exits from the Work Areas or establish alternative exits satisfactory to the local fire officials. Emergency exits and routes shall be established and clearly marked with florescent paint or other effective designations to permit easy location from anywhere within the Work Area. Emergency exits shall be secured to prevent access from uncontaminated areas and yet permit emergency exiting. Exits shall be checked daily against exterior blockage or impediments to exiting.
- i. Temporary lighting within the Work Area and decontamination system shall be provided as required to achieve minimum illumination levels.
- j. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacture equipped with HEPA filtered local exhaust ventilation.
- k. Prior to being plasticized, the Work Areas shall be cleaned using HEPA-vacuum equipment and/or wet cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall not be used.
- l. There shall be an airlock at the entrance to the tent, unless there is an attached worker or waste decontamination system.
- m. Plasticize the area after pre-cleaning, using the following procedures. Do not apply polyethylene sheeting to the wall and ceiling surfaces that will be demolished to access ACM.
  - (1) Cover floor with one layer of fire retardant 6-mil polyethylene

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- sheeting, turning layer a minimum of 12 inches up wall, and seal layer to wall.
- (2) Cover walls with one layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to floor layer.
  - (3) Cover ceilings with one layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to wall layer.
  - (4) Repeat procedure for second layer. All joints in polyethylene sheeting shall be glued and taped in such a manner as to prohibit air passage. Joints on plastic layers shall be staggered to reduce the potential for water to penetrate.
  - (5) In areas where demolition is required to access ACM, a layer of fire retardant 6-mil reinforced polyethylene sheeting shall be placed on the floor of the enclosure.
  - (6) Perform demolition required to access ACM. Debris resulting from demolition activities shall be disposed of as ACM as described in this Specification.
  - (7) Repeat preparation of areas accessed by demolition activities as described above.
  - (8) Suspended ceiling tiles and T-grid components shall remain in place until the preparation of the Work Area below the ceiling tiles are completed and personnel and equipment decontamination enclosures have been constructed.
  - (9) Protect non-ACM insulation within the Work Area(s) with two individual layers of fire retardant 6-mil polyethylene sheeting. Sheeting shall remain in-place until satisfactory clearance air monitoring results are achieved.
- n. Installation of glove-bags for removal of thermal system insulation, when required:
- (1) General: Glove-bag operations shall be performed using commercially available glove-bags of at least fire retardant 6-mil, transparent plastic appropriately sized for the diameter of the material to be removed. The use of "moveable" glove-bag techniques is strictly forbidden. At no time, shall the glove-bag be sized to allow for the removal of more than three linear feet of insulation. Glovebag procedures may only be used in

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conjunction with full containment of the work area or the tent procedure.

- (2) Place the necessary tools and materials inside of the tool pouch of the glove-bag before the glove-bag procedure begins.
  - (3) Place duct-tape securely around the affected area to form a smooth area to which the glove-bag can be securely fastened.
  - (4) Attach glove-bag to the cable, wire or pipe. Seal top of glove-bag by double folding and stapling. Place duct-tape along the seam to form an airtight seal. Seal sides of glove-bag, where cable, wire or pipe passes through, with duct-tape to form an airtight seal.
  - (5) If the material adjacent to the work section is damaged, terminates, is jointed or contains an irregularity, wrap the section in two layers of 6-mil fire retardant polyethylene sheeting and seal airtight with duct-tape.
  - (6) Smoke test each glove-bag as indicated below. The Third-Party Air Monitor shall be present during all smoke testing.
  - (7) The glovebag shall be placed under negative pressure utilizing a HEPA vacuum, and a smoke tube shall then be aspirated to direct smoke at all seams and seals from outside the glovebag. Any leaks detected by the smoke test shall be duct taped airtight.
  - (8) All necessary tools and materials shall be brought into the work area before the glovebag procedure begins.
  - (9) Glovebag procedures shall be conducted by workers specifically trained in glovebag procedures and equipped with appropriate personal protective equipment.
  - (10) The insulation diameter worked shall not exceed one half the bag working length above the attached gloves.
- o. Glovebag procedures shall be conducted by workers specifically trained in glovebag procedures and equipped with appropriate personal protective equipment.
- p. Pre-Removal Inspections
- (1) Prior to removal of any ACM, the Asbestos abatement contractor shall notify the Third-Party Air Monitor and request

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a pre-removal inspection. Posting of warning signs, building of decontamination enclosure systems, and all other preparatory steps have been taken prior to notification of the Third-Party Air Monitor.

- (2) Asbestos abatement contractor shall correct any deficiencies observed by Third-Party Air Monitor at no additional cost to City.
- (3) Following the Third-Party Air Monitor's approval of the Work Area preparations, removal of ACM may commence.

### 2. Removal of ACM Thermal Insulation Using Glove-Bag Techniques:

- a. Mist material with amended water. Allow sufficient time for the amended water to penetrate the material to be removed.
- b. Remove the insulation using hand tools such as knives or scissors.
- c. Exercise caution when removing insulation.
- d. Remove any residual asbestos-containing insulation from the substrate using wet cleaning methods and nylon-bristled hand brushes.
  - (1) Any insulation ends created by this procedure shall be sealed with encapsulant prior to bag removal or thoroughly wetted before bag removal and sealed with wettable cloth end caps and spray glue or any combination of these materials immediately following bag removal.
  - (2) The tool pouch shall be separated from the bag prior to disposal by twisting it and the wall to which it is attached several times, and taping the twist to hold it in place, thus sealing the bag and the pouch which are severed at the midpoint of the twist. Alternatively, the tools can be pulled through with one or both glove inserts, thus turning the gloves inside out. The glove(s) is/are then twist sealed forming a new pouch, taped and several mid-seal forming two separate bags.
  - (3) A HEPA vacuum shall be used for evacuation of the glovebag in preparation for removal of the bag from the surface for clean-up in the event of a spill, and for post project clean-up.
  - (4) With the glovebag collapsed and the ACM in the bottom of the bag, the bag shall be twisted several times and taped to seal that section during bag removal.

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- (5) A 6-mil plastic bag shall be slipped around the glovebag while it is still attached to the surface. The bag shall be detached from the surface by removing the tape or cutting the top with blunt scissors.
  - (6) The asbestos-containing waste, the clean-up materials, and protective clothing shall be wetted sufficiently, double-bagged minimizing air content, sealed separately, and disposed of in conformance with applicable regulations.
3. Removal of ACM Utilizing Tent Containment Procedure:
  - a. Tent procedures shall be limited to the removal of less than 260 linear feet and 160 square feet of ACM and shall not result in disturbance of ACM during tent erection.
  - b. Mist material with amended water and/or foam. Allow sufficient time for the amended water to penetrate the material to be removed.
  - c. Cut bands, wire or other items placed over insulation or ACM.
  - d. Remove the ACM using hand tools such as knives or scrapers.
  - e. Exercise caution when removing ACM.
  - f. Remove any residual asbestos-containing material from the substrate using wet cleaning methods.
  - g. Seal exposed ends of remaining insulation or ACM with a "wetable cloth" and/or encapsulant.
  - h. Place the removed material immediately into a properly labeled fire retardant 6-mil polyethylene bag. All material shall be properly containerized and decontaminated prior to removal from the Work Area.
  - i. Following the completion of removal of ACM, all visible residue shall be removed from the substrate.
4. Following Removal of ACM Utilizing Tent Containment or Tent/Glovebag Procedure:
  - a. Clean all visible accumulations of loose ACM. Metal shovels shall not be used within the Work Area.



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- b. Accumulations of dust shall be cleaned continuously until completion of clean up.
- c. After removal of all visible accumulations of ACM, the area shall be:
  - (1) Wet cleaned using rags, mops or sponges.
  - (2) Permitted sufficient time to dry, prior to HEPA vacuuming all substrates.
  - (3) Lightly encapsulated to lockdown residual asbestos. A thin coat of an encapsulating agent shall be applied to any surfaces in the Work Area which were not the subject of removal or other remediation activities. In no event shall encapsulant be applied to any surface that was the subject of removal or other remediation activities prior to obtaining satisfactory clearance air monitoring results. Asbestos abatement contractor shall request and pass a visual inspection performed by the consultant before proceeding to the next step. Documentation of passing this inspection shall be recorded in a daily logbook.
  - (4) The Third-Party Air Monitor will conduct a visual observation of the Work Area to verify the absence of asbestos-containing waste materials.
  - (5) If the Work is accepted by the Third-Party Air Monitor based on the inspection, asbestos abatement contractor shall be notified. Conduct the following activities in accordance with the contract and all applicable laws, codes, rules and regulations.
    - (a) All waste shall be removed from the Work Area and holding areas.
    - (b) All tools and equipment are to be removed and decontaminated in the decontamination enclosure system.
  - (6) If the Work is not approved, the Third-Party Air Monitor will inform Asbestos abatement contractor who will then HEPA-vacuum and/or wet-clean the Work Area. The Third-Party Air Monitor will then perform a subsequent visual observation. This process will continue until the Third-Party Air Monitor accepts the Work Area as clean.
  - (7) The Work Area shall be vacated for a minimum of one hour to allow fibers to settle prior to clearance air monitoring, when required.

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- d. Final Barrier Removal
  - (1) Upon receipt of acceptable clearance testing results polyethylene sheeting (inside layers) and Isolation Barriers shall be removed and disposed accordingly as ACM. The tent shall be collapsed inward, enclosing the contaminated clothing. This contaminated material shall be disposed of in another plastic bag. The HEPA vacuum shall be decontaminated and sealed.
  - (2) The area surrounding the abatement work place shall be cleaned of any visible debris utilizing HEPA-vacuum and wet methods.
- e. The Third-Party Air Monitor will conduct a final visual inspection. Approval must be granted prior to break down of decontamination facility and asbestos abatement contractor demobilization. Other Information: Extra time required to clean Work Areas in order to achieve clearance criteria shall not be considered grounds for an extension of time for contract completion.

D. Removal of Floor Tile and Mastic utilizing NYCDEP Title 15, Chapter 1 §1-108 Foam/Viscous Liquid Use in Flooring Removal procedures shall be as follows:

- 1. Preparation of the Work Area:
  - a. These procedures only apply to the removal of vinyl asbestos floor tiles (VAT), ACM floor coverings and associated mastics and adhesives, where only the ACM being abated in the work area is flooring material.
  - b. Request that the Third-Party Air Monitor perform area monitoring and establish a background count prior to the preparatory operations for each removal area.
  - c. Provide and install decontamination enclosure systems in accordance with PART 3 - EXECUTION, Sections 3.01 and 3.02 of these Specifications and NYCDEP Title 15, Chapter 1. Decontamination facilities may be remote from the Work Areas upon approval from NYCDEP.
  - d. Shut down, isolate, and lock out or tag heating, ventilating, and air conditioning (HVAC) systems which serve or which pass through the Work Area. Vents within the Work Area and seams in HVAC components shall be sealed with tape and two layers of polyethylene sheeting. Filters in HVAC systems shall be removed and treated as asbestos contaminated waste.

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- e. Shut down, disconnect, and lock out or tag all electric power to the Work Area so that there is no possibility of its reactivation until after clearance testing of the Work Area.
- f. Seal floor drains, sumps and other collection devices with two layers of fire retardant 6-mil plastic and fire rated plywood, as necessary, and provide a system to collect all water used by the Asbestos abatement contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer.
- g. Separate by means of airtight barriers (isolation barriers) parts of the building that are not included in the Work Area(s) from parts of the building that will undergo asbestos abatement.
- h. Seal with isolation barriers: open doorways, cased openings, and corridors that will not be used for passage during work.
- i. Isolation barriers shall extend from the floor to the ceiling and form an airtight seal. They shall be built using 2-inch by 4-inch wood or metal framing placed 16 inch on center and shall be braced as necessary. Cover the work sides of the studding with two layers of 6-mil fire retardant, reinforced polyethylene sheeting. Install barriers to form a leaktight seal between the Work Area and adjacent areas. Install isolation barriers in a manner to endure "negative air pressure" within the Work Area.
- j. Completely seal airtight and isolate the Work Area. All openings, including but not limited to doorways, tunnels, ducts, grilles, cracks, diffusers, openings through which pipe conduit passes, and any other penetrations of the Work Area, shall be covered with polyethylene sheeting taped or caulked airtight.
- k. Maintain emergency and fire exits from the Work Areas or establish alternative exits satisfactory to the local fire officials. Emergency exits and routes shall be established and clearly marked with fluorescent paint or other effective designations to permit easy location from anywhere within the Work Area. Emergency exits shall be secured to prevent access from uncontaminated areas and yet permit emergency exiting. Exits shall be checked daily against exterior blockage or impediments to exiting.
- l. Temporary lighting within the Work Area and decontamination system shall be provided as required to achieve minimum illumination levels.

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- m. After isolating the area, install and initiate operation of air filtration devices (AFDs) to provide a negative pressure of at least -0.02 inches of water and four air changes per hour within the Work Area relative to surrounding non-Work Areas. In areas where negative air units can not be exhausted to the exterior of the station, units shall be installed in series. When installing units in series, the exhaust from an AFD shall be exhausted into the intake of a second AFD of equal or greater capacity. The exhaust from the second unit shall be directed to the exterior of the Work Area in an area that is not accessible to the public. Both units shall be located inside the Work Area. Exhaust and connect AFD using spiral-reinforced tubing manufactured for this purpose. Do not shut down AFDs until the Work Area is released to the City following final clearance procedures.
- n. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacturer-equipped with HEPA filtered local exhaust ventilation.
- o. Scaffolds shall be provided for workers engaged in work that cannot safely be performed from the ground or other solid Work Area surface.
- p. Work Area Pre-cleaning Procedures: After establishing the decontamination enclosure systems, prepare and pre-clean the Work Area as specified below:
  - (1) Movable and loose items not removed by the City shall be cleaned using HEPA vacuum equipment and/or wet cleaning methods as appropriate and shall be removed from the Work Area and stored at the City's direction.
  - (2) Movable and loose items contaminated with asbestos shall be removed from the Work Areas and properly discarded as asbestos contaminated waste.
  - (3) Fixed objects within the Work Area shall be pre-cleaned using HEPA-vacuum equipment and/or wet cleaning methods as appropriate. Joints of covers or casings shall be sealed with tape and fixed objects enclosed with a minimum of two layers of 6-mil fire retardant polyethylene sheeting sealed airtight with tape. Disassembly of these fixed objects is not required unless otherwise noted. Fixed objects shall include, but not be limited to, light fixtures, junction boxes, hangers and black carrying channels.

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- (4) Prior to being plasticized, the Work Areas shall be cleaned using HEPA-vacuum equipment and/or wet cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA-filters, shall not be used.
- q. Plasticize the area after pre-cleaning, using the following procedure:
- (1) Floor surfaces shall be sealed with a minimum of two layers of fire retardant 6-mil plastic sheeting, except where the only ACM being abated in the project is vinyl asbestos floor tile or other flooring material, in which case the floor need not be sealed;
  - (2) Baseboards and wall surfaces shall be sealed with a minimum of two layers of fire retardant 6-mil plastic sheeting up to a minimum height of four feet above the floor. If hand power tools are used during abatement, wall surfaces shall be covered with a layer of fire retardant 6-mil polyethylene sheeting to minimum height of six feet.
- r. Pre-Removal Inspections
- (1) Prior to removal of any ACM, the asbestos abatement contractor shall notify the Third-Party Air Monitor and request a pre-removal inspection. Posting of warning signs, building of decontamination enclosure systems, and all other preparatory steps have been taken prior to notification of the Third-Party Air Monitor.
  - (2) Asbestos abatement contractor shall correct any deficiencies observed by Third-Party Air Monitor at no additional cost to City.
  - (3) Following the Third-Party Air Monitor's approval of the Work Area preparations, removal of ACM may commence.
2. Removal of ACM Floor Tile and Mastic:
- a. Prior to actual removal, the floor tiles and associated mastic shall be blanketed and wetted with a minimum 1-inch to 3-inch coating of the acceptable foam or viscous liquid that shall leave an identifiable colored residue when it dissipates and shall be maintained for the duration of the removal until the material is bagged.

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- b. The foam or viscous liquid shall be non-toxic, shall not require special respiratory protection from handling, and shall not affect the handling and disposal of the waste.
  - c. The foam or viscous liquid shall coat and wet the ACM. The ACM shall be kept wet through the bagging process.
  - d. Persons entering the work area shall wear correctly-fitting, good-traction rubber boots.
  - e. Remove floor tile and all underlying layers using a flat hoe or scraper. Remove adhesive backing using approved mastic removal solvent. Do not grind or sand floor.
  - f. Completely remove floor tile and adhesive backing using appropriate tools and materials. As material is removed, wrap it in two layers of plastic and place it in labeled containers for transport.
  - g. Completely remove bulk mastic using an approved mastic solvent. Product application shall be in accordance with the manufacturer's instructions and the Material Safety Data Sheet (MSDS) for the product. Do not allow solvent to stand or to be absorbed by sub-floor. Use diatomaceous earth to prevent the flow of solvent under walls or into other areas from which it would be difficult to recover. Absorb spent solvent and associated mastic immediately after use with diatomaceous earth and place in drums dedicated for the disposal of floor tile mastic waste.
  - h. After completion of mastic removal, thoroughly wash the floor with detergent and rinse clean. Use sufficient quantities of diatomaceous earth to soak up water and detergent so that the waste is completely solid. Place waste in sealed drums dedicated for the disposal of floor tile mastic waste. No bulk mastic residue and traces of foam/viscous liquid shall remain on the floor surface following removal and cleaning. It is not necessary to remove stain from pores of concrete.
  - i. Spent mastic removal agents must be properly stored, categorized and disposed. Refer to "ACM Waste Packing and Load Out Procedures".
  - j. On completion of floor mastic removal, the floor shall be smooth, free from ridges and bumps, and suitable to receive replacement flooring.
3. Additional Removal Requirements: The Third-Party Air Monitor shall issue a stop work order if visible emissions are detected outside the Work Areas and/or should the airborne fiber concentrations meet or exceed 0.01 f/cc of air or the background count (use the greater of these two values as the

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reference). Work shall not resume until the condition(s) causing the increase are corrected, surfaces are decontaminated using HEPA vacuums or wet cleaning techniques and the Asbestos abatement contractor receives notice from the Third-Party Air Monitor.

4. Following Removal of ACM Floor Tile and Mastic:
  - a. All surfaces shall be wet cleaned.
  - b. HEPA-vacuum all surfaces.
  - c. Conduct the following activities in accordance with the contract and all applicable laws, codes, rules and regulations.
    - (1) All waste shall be removed from the Work Area and holding areas.
    - (2) All tools and equipment are to be removed and decontaminated in the decontamination enclosure system.
  - d. The Third-Party Air Monitor will conduct a visual observation of the Work Area to verify the absence of asbestos-containing waste materials.
  - e. If the Work is not approved, the Third-Party Air Monitor will inform asbestos abatement contractor who will then wet-clean and HEPA-vacuum the Work Area. The Third-Party Air Monitor will then perform a subsequent visual observation. This process will continue until the Third-Party Air Monitor accepts the Work Area as clean.
  - f. Remove polyethylene barriers from the walls of the Work Area. Isolation barriers shall remain in place.
  - g. Perform a thorough HEPA-vacuuuming of the Work Area.
  - h. The Third-Party Air Monitor will conduct a visual observation of the Work Area to verify the absence of asbestos-containing waste materials.
  - i. If the Work is not approved, the Third-Party Air Monitor will inform asbestos abatement contractor who will then HEPA-vacuum the Work Area. The Third-Party Air Monitor will then perform a subsequent visual observation. This process will continue until the Third-Party Air Monitor accepts the Work Area as clean.

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- j. If results of air sampling performed during abatement activities indicate airborne fiber concentrations of less than 0.01 fibers per cubic centimeter, or the background level, whichever is greater, final clearance air sampling is not required. The abatement action may be considered complete.
- k. Isolation Barrier Removal
  - (1) Upon receipt of acceptable observation results, polyethylene sheeting and barrier tape shall be removed and disposed accordingly as ACM.
  - (2) The area surrounding the abatement work place shall be cleaned of any visible debris utilizing HEPA vacuum and wet methods.
- l. The Third-Party Air Monitor will conduct final visual inspection. Approval must be granted prior to break down of decontamination facility and asbestos abatement contractor demobilization. Other Information: Extra time required to clean Work Areas in order to achieve clearance criteria shall not be considered grounds for an extension of time for contract completion.

### 4.02 MAINTENANCE OF CONTAINED WORK AREA AND DECONTAMINATION ENCLOSURE SYSTEMS

- A. Ensure that barriers are installed in a manner appropriate to the expected weather conditions during the project and for its duration. Repair damaged barriers and remedy defects immediately upon their discovery. Visually inspect barriers at the beginning and end of each work period.
- B. Visually inspect non-Work Areas and the decontamination enclosure system for water leakage. Check the floor below, ceiling and walls, and view beneath/or around the decontamination enclosure system, for signs of leakage. Perform the visual inspection a minimum of two times for each 8-hour work shift.

## PART 5 – ASBESTOS WASTE MANAGEMENT

### 5.01 ACM WASTE REQUIREMENTS

- A. The asbestos abatement contractor and all sub-asbestos abatement contractors are specifically alerted to the illegal practice of combining asbestos-containing waste (ACW) from one project with the ACW of other projects without using the services of a permitted waste transfer station as defined by 6 NYCRR Part 360 and 364. As part of the shop drawing submittals, the Asbestos abatement contractor must submit for approval the proposed method of transportation and disposal that



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will be utilized to manage the ACW of this Contract. If a permitted transfer station is to be used, the cost shall be included in the work.. The asbestos abatement contractor must submit a waste manifest consistent with whatever approved method is utilized as part of the invoicing and payment procedures.

- B. The asbestos abatement contractor shall maintain compliance with the strictest set of regulations of Title 15, Chapter 1 of RCNY, NYC LL 70/85, NYS DOL ICR 56, USEPA, Asbestos Regulation 40 CFR Section 61.152, 29 CFR 1926.1101, 29 CFR 1910.1200 (F) of OSHA's Hazard Communication Standards, and other applicable standards.

**NOTE:** Any penalties incurred for failure to comply with any of the above regulations will be the sole responsibility for fines imposed due to negligence of the Asbestos abatement contractor.

- C. When presenting ACW for storage at the generation site, the Asbestos abatement contractor shall:

1. Wet down ACW in a manner sufficient to prevent all visible emissions of dust into the air.
2. Seal material in a leak tight container while wet.
3. Keep ACW separate from any other waste.

- D. When presenting ACW for storage away from the site of generation, the Asbestos abatement contractor shall:

1. Ensure that ACW has been properly packaged as per requirements above.
2. Examine the containers of ACW to ensure that there are no breaks in the containers and that no visible dust is being released into the air.
3. If examination reveals damage to a container of ACW the Asbestos abatement contractor or person accepting the waste shall immediately wet down the ACW and repackage it into a clean leak tight container. The subsequent repackaging shall be the financial responsibility of the Asbestos abatement contractor and occur at no extra cost to the City.
4. Keep ACW separate from any other waste.

- E. When storing ACW – The Asbestos abatement contractor shall:

1. Ensure that the ACW has been sufficiently wetted down in tight containers.
2. Re-wet and repackage any damaged containers.

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3. Maintain at storage site an adequate supply of spare leak tight containers.
  4. Maintain at storage site an adequate supply of amended water.
  5. Keep ACW separate from any other waste.
  6. Keep ACW in a secured, enclosed, and locked container.
  7. If the Asbestos abatement contractor has intention of sorting a quantity of ACW greater than or equal to 50 cubic yards, the Asbestos abatement contractor shall:
    - a. Submit a written request and receive written approval from the City.
- F. When presenting for transport, the Asbestos abatement contractor shall:
1. Ensure that ACW has been sufficiently wetted down.
  2. Examine the integrity of the container's airtight seal.
  3. Re-wet and repackage any damaged containers.
  4. Keep ACW separate from all other waste.
  5. Ensure that a person transporting asbestos waste holds a valid permit issued pursuant to law.
  6. Frequency of Waste Removal:
    - a. Properly packaged and labeled asbestos waste shall be removed from the site on a daily basis. Under no circumstance shall asbestos waste be stored on site without written approval from the City. The Waste Hauler and landfill shall be as indicated on the notifications to regulatory agencies.
- G. Waste Load-out Through Equipment Decontamination Enclosure (Full Decontamination Facility): Place asbestos waste in disposal bags. Large items not able to fit into disposal bags shall be wrapped in one layer of 6-mil thick polyethylene sheeting. Clean outer covering of asbestos waste package by wet cleaning and/or HEPA-vacuuming in a designated part of the Work Area. Move wrapped asbestos waste to the equipment washroom, wet clean each bag or object and place it inside a second disposal bag, or a second layer of 6-mil polyethylene sheeting, as the item's physical characteristics demand. Air volume shall be minimized, and the bags or sheeting shall be sealed airtight with tape.
1. The clean containerized items shall be moved to the equipment decontamination enclosure holding area pending load-out to storage or disposal facilities.

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2. Workers who have entered the equipment decontamination enclosure system from the uncontaminated non-Work Area shall perform load-out of containers from the decontamination enclosure holding area. Dress workers moving asbestos waste to storage or disposal facilities in clean overalls of a color different than from that of coveralls used in the Work Area. Ensure that workers do not enter from uncontaminated areas into the equipment washroom or the Work Area. Ensure that contaminated workers do not exit the Work Area through the equipment decontamination enclosure system.
  3. Thoroughly clean the equipment decontamination enclosure system immediately upon completion of the waste load-out activities, and at the completion of each work shift.
  4. Labeled ACM waste containers or bags shall not be used for non-ACM debris or trash. Any materials placed in labeled containers or bags, including those turned "inside-out", shall be handled and disposed of as ACM waste.
- H. All asbestos materials, wastes, shower water, polyethylene, disposable equipment and supplies shall be disposed of as asbestos contaminated waste, in accordance with the EPA regulation (40 CFR, Section 61.150) and those requirements of the New York Department of Environmental Conservation and New York City Department of Sanitation.
- I. All asbestos materials shall be prepared for transportation in accordance with this specification and all applicable Federal, State, County and City Regulations. asbestos abatement contractor shall submit the following documentation:
1. Where applicable, an EPA Generator's identification number which has been obtained from the EPA for all asbestos waste generated from the project.
  2. Applicable State Waste Hauler license and registration numbers.
  3. Federal Hazardous Materials Waste Hauler number.
  4. Designated landfill EPA Permit numbers.
- J. Prior to loading asbestos waste the enclosed cargo areas (dumpster) shall be prepared as follows:
1. Clean via HEPA-vacuum and wet wipe techniques the enclosed cargo areas of all visible debris prior to preparing with polyethylene.
  2. Line the cargo area with two layers of 6-mil polyethylene sheeting to prevent contamination from damaged or leaking containers. Floor sheeting shall be installed first and extend up the walls a minimum of 24-inches. Wall sheeting shall be overlapped and taped securely into place.

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- K. Asbestos-containing waste shall be placed on level surfaces in the cargo area of the dumpster and shall be packed tightly to prevent any shifting or tipping of the waste during transportation.
- L. Asbestos-containing waste shall not be thrown into or dropped from the dumpster. All material shall be handled carefully to prevent rupture of the containers.
- M. All personnel engaged in handling and loading of asbestos contaminated waste outside of the Work Area shall wear protective clothing. The disposable clothing shall include head, body and foot protection and color of clothing shall be different from abatement personnel in the Work Area. Minimum respiratory protection shall be half face, dual cartridge, air purifying respirators with HEPA-filters.
- N. Asbestos abatement contractor shall immediately clean debris or residue observed on containers or surfaces outside of the Work Area. Cleaning shall be via HEPA equipped wet/dry vacuums only.
- O. All asbestos-containing waste shall be transported from the abatement site to the landfill by a registered Waste Hauler. When transporting ACW:
  - 1. Ensure that the ACW has been sufficiently wetted down in a leak tight container.
  - 2. Re-wet and repackage any damaged containers.
  - 3. Maintain at storage site an adequate supply of spare leak tight containers.
  - 4. Maintain at storage site an adequate supply of amended water.
  - 5. Keep ACW separate from any other waste.
- P. Keep ACW in a secured, enclosed, and locked container.
- Q. Waste transport documents shall conform to the requirements of the U.S. Department of Transportation, Hazardous Materials Transportation Regulation, 49 CFR Part 173 and EPA 40 CFR 61.150 (d)(1)(2). Shipping documents shall be clearly marked with the required designation "RQ Asbestos". Asbestos abatement contractor shall provide a copy of this document to the City.
- R. A uniform hazardous waste manifest shall be prepared by the asbestos abatement contractor and signed by the asbestos abatement contractor each time the asbestos abatement contractor ships a dumpster load of Asbestos-Containing Waste Material. The uniform hazardous waste manifest shall include the site of waste generation, the names and addresses of the Transporter, the asbestos abatement contractor, and the landfill operator with information on the type and number of asbestos-waste containers, time and date. Asbestos abatement contractor shall

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provide the Construction Project Manager, Third-Party Air Monitor or authorized designated representative with signed copies of the waste manifest before each departure.

- S. Asbestos abatement contractor or his registered hazardous Waste Hauler shall transport asbestos-containing waste material from the abatement site directly to the specified disposal site. Asbestos abatement contractor or their Waste Hauler shall not accept material from any other site when transporting asbestos-containing waste material from the abatement site. The authorized DDC representative or Construction Project Manager reserves the right to travel with asbestos abatement contractor's Waste Hauler to the waste disposal site. No intermediate storage of waste material (i.e., asbestos abatement contractor's warehouse) shall be permitted.
- T. Final or progress application for payments will not be processed unless all hazardous waste manifests generated to date have been received and reviewed by the Construction Project Manager.
- U. All asbestos materials, wastes, shower water, polyethylene disposable equipment and supplies shall be disposed of as asbestos contaminated waste, in accordance with the EPA regulation (40 CFR, Section 61.150) and those requirements of the New York State Department of Environmental Conservation and the New York Department of Sanitation.
- V. Asbestos abatement contractor shall transport all sealed drums to a landfill disposal site approved by the Department of Environmental Conservation and the EPA. Transportation shall be performed by a New York State registered Waste Hauler, where required. When presenting the ACW for disposal the Asbestos abatement contractor or sub Asbestos abatement contractor shall:
  - 1. Ensure that waste container is properly labeled according to the National Emission Standard for Hazardous Air Pollutants (NESHAP); Asbestos Revision, 40 CFR, Part 61, Subpart M. The labels shall include the name of the waste generator and the location where the waste was generated.
  - 2. Comply with all applicable orders issued pursuant to asbestos disposal.
  - 3. Ensure that ACW has been sufficiently wetted down.
  - 4. Re-wet and repackage any damaged containers.
  - 5. Keep ACW separate from all other wastes.
- W. Asbestos abatement contractor shall notify the waste disposal site, at least 24 hours prior to transportation of asbestos contaminated waste to be delivered. Asbestos abatement contractor shall determine if a larger notification period is required.
- X. At the site asbestos abatement contractors or Waste Hauler trucks shall approach

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the dump location as close as possible for unloading asbestos waste. Containers shall be carefully placed in the ground. Do not throw containers from truck.

- Y. Asbestos abatement contractor or Waste Hauler shall inspect containers as they are unloaded at the disposal site. Material in damaged containers shall be repacked in empty containers, as necessary.
- Z. Asbestos abatement contractor or Waste Hauler shall not remove asbestos-containing waste Material from drums unless required to do so by the disposal site City. Used drums shall be disposed of as asbestos-asbestos contaminated waste.
- AA. All personnel engaged in unloading of the containers at the waste site shall wear protective clothing. The disposable clothing shall include head, body and foot protection. Minimum respiratory protection shall be half face, dual cartridge, air purifying respirators with HEPA-filters. Workers shall remove their protective clothing at the disposal site, place it in labeled disposal bags and leave them with the deposited waste shipment.
- BB. For the compaction operation, the asbestos abatement contractor shall ensure that disposal sites personnel have been provided with personal protective equipment by the disposal operator. If the disposal site City has not provided this protective equipment, the asbestos abatement contractor shall supply protective clothing and respiratory protection for the duration of this operation (PAPR respirators are mandatory).
- CC. If containers are broken or damaged, the asbestos abatement contractor or Waste Hauler shall, using personnel who are properly trained and wearing proper protective equipment, shall repackage the waste in properly labeled containers. Asbestos abatement contractor shall then clean the entire truck and its contents using HEPA-vacuums and wet cleaning techniques until no visible residue is observed.
- DD. Following the removal of all containerized waste, the asbestos abatement contractor shall decontaminate the truck cargo area using HEPA-vacuums and/or wet cleaning techniques until no residue is observed. All 6-mil polyethylene sheeting shall be removed and discarded as asbestos-containing waste material along with contaminated cleaning material and protective clothing, in containers at the disposal site.
- EE. The transporter(s) of all asbestos waste shall not back-haul any items on his return from landfill/disposal site.
- FF. All asbestos waste shall be disposed of in an approved Asbestos Landfill site only.
  - 1. NO PERSON UNDER ANY CIRCUMSTANCES SHALL ABANDON ACW. The same shall be disposed of only by certified persons in approved landfills.

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2. A manifest form will be signed by the Landfill documenting receipt and acceptance of the asbestos-containing waste. This manifest will be furnished to the City of New York within thirty calendar days from the project completion date.
3. It is the responsibility of the Asbestos Abatement contractor to determine current waste handling, transportation and disposal regulations for the work site and for each waste disposal landfill. The Asbestos Abatement contractor must comply fully with these regulations and all appropriate U.S. Department of Transportation, EPA and other Federal, State and Local entities' regulations and all other current legal requirements.
4. The asbestos abatement contractor shall obtain an agreement from the transporter (s) that the practice of "Back-Hauling" will not be engaged in, with respect to any and all waste loads taken from this site during the work.
5. The asbestos abatement contractor will document actual disposal of the waste at the designated landfill by having completed a Disposal Certificate and will provide a copy of the same to the Department of Design and Construction.

### PART 6 – ACCEPTANCE

#### 6.01 ACCEPTANCE

Upon satisfactory completion of all decontamination procedures, a certificate will be issued by the Construction Project Manager with copies to all parties.

- A. A letter of Compliance stating that all the work on the project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations.
- B. All warranties as stated in the Specifications.

**END OF SECTION 028213**

SECTION 03 30 00  
CAST IN PLACE CONCRETE

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to the work of this Section.

## 1.2 SUMMARY

- A. Section includes but is not limited to the following as shown on the drawings and as specified herein:
1. Foundation systems including footings, piles, pile caps, walls, beams, piers, and similar concrete.
  2. Slabs on grade.
  3. Structural slabs on grade.
  4. Cast-in-place slabs, beams, and walls.
  5. Flowable underlayment.
  6. Furnishing and installing all required anchors and inserts.
  7. Placing in the forms all inserts, anchors, anchor bolts, bearing plates and the like furnished by other trades for casting into the concrete and cleaning of same after stripping of forms.
  8. Protection of all inserts, anchors, hangers, sleeves and supports furnished and set by others for the attachment of other work to the concrete, or required to permit the passage of other work through the concrete.
  9. Supply, fabricate and place all required reinforcing bars, mesh and other reinforcement for concrete where shown, called for, and/or required complete with proper supporting devices.
  10. Erection and removal of all formwork required to properly complete the work.
  11. Finishing of all concrete work as hereinafter specified.
  12. Curing and protection of all concrete work.
  13. Site concrete consisting of curbs, walks, pads, boxes and the like as shown on the drawings.
  14. Floor sealers and dust-proofing of all areas exposed and/or covered with carpet.
  15. Cutting, patching, grouting, repairing and pointing up as required.
  16. Vapor barrier system below slabs on grade.
  17. Under slab subbase course.
  18. Dewatering.
  19. Waterproofing.
  20. Grouting of all beam bearing plates and column base plates.
  21. Equipment pads as required.
  22. All other work and materials as may be reasonably inferred and needed to make the work of this section complete.
  23. Waste Management.



**B. Related Requirements:**

1. Division 01 DDC General Conditions
2. Division 03 Section "Concrete Floor Topping"
3. Division 04 Section "Unit Masonry"
4. Division 05 Section "Structural Steel"
5. Division 05 Section "Metal Deck"
6. Division 05 Section "Metal Fabrications"
7. Division 06 Section "Rough Carpentry"
8. Division 07 Section "Waterproofing"
9. Division 07 Section "Joint Sealants"

**1.3 SUSTAINABLE DESIGN REQUIREMENTS**

- A. The Contractor is to implement practices and procedures to meet the Project's Sustainable Design goals, which include achieving LEED Silver. The Contractor shall ensure that the requirements related to these goals, as defined in this Section and in Related Sections of the Contract Documents, are implemented. Substitutions, or other changes to the Work proposed by the Contractor or their Subcontractors, shall not be allowed if such changes compromise the Project's Sustainable Design goals.
- B. The Contractor is to efficiently use resources and energy while executing the Work of this Section. Resource efficient aspects to be considered in completing this Project include the use of techniques that minimize waste generation, reuse of construction materials on site where possible, and recycling of waste generated during the construction process.
- C. Performance Requirements: The following criteria are required for the products included in this section
1. All reinforcing steel, steel anchors, welded wire fabric, and other steel items required by the work of this section shall contain a minimum of 50% (combined) pre-consumer/post-consumer recycled content.
  2. Adhesives, sealants, paints and coatings used for the work of this section shall meet the Volatile Organic Compound (VOC) limits specified in Section 018113 "Sustainable Design Requirements," where applicable.
- D. LEED Performance Requirements:
1. Certification of recycled content, sourcing of materials, and VOC content shall be in accordance with the LEED Submittals requirements of this section.

**1.4 LEED SUBMITTALS**

- A. Submit LEED Certification items as follows:
1. LEED Materials Certification Form: For all installed products and materials of this Section, complete the "Environmental Materials Reporting Form" (attached to end of Section 018113 "Sustainable Design Requirements"). Information to be supplied for this Form shall include:

- a. Cost breakdowns for materials included in the Contractor or sub-contractor's Work. Material cost does not include costs associated with labor and equipment.
  - b. The percentages (by weight) of pre-consumer and/or post-consumer recycled content in the supplied product(s).
  - c. Indication of whether the raw materials have been extracted, harvested or recovered, as well as the final product has been manufactured (location of final assembly), within 500 miles of the project site.
- B. VOC Reporting Form: For all installed products and materials of this Section, complete the "VOC Reporting Form" (attached to end of Section 018113 "Sustainable Design Requirements"). Information to be supplied for this Form shall include:
1. Provide generic name by means of product type or application of all field-applied interior adhesives, sealants, paints, and coatings in this Section.
  2. Provide corresponding referenced standard limits.
  3. Provide full name of supplied product(s) and vendor or manufacturer for each product in this Section.
  4. For all field-applied interior adhesives, sealants, paints, and coatings in this Section, provide Volatile Organic Compound (VOC) content in grams/liter or lbs./gallon.
- C. Letters of Certification: Provided by the manufacturer on the manufacturer's letterhead, verifying the amount of recycled content.
- D. Product Cut Sheets: For all materials that meet the sustainable design performance criteria as per the LEED Performance Requirements of this section.
- E. Material Safety Data Sheets (MSDS): For all applicable products. Applicable products include, but are not limited to, adhesives, sealants, paints, and coatings applied to the interior of the building. MSDS shall indicate the Volatile Organic Compound (VOC) content of products submitted. If an MSDS does not indicate VOC content, then product data sheets, manufacturer's literature, or certification letter indicating a product's VOC content can be submitted with the MSDS.
- F. Assemble required LEED Submittal information into one (1) package for each Specification Section or sub-contractor. Incomplete or inaccurate LEED Submittals may be used as the basis for rejecting the submittal products or assemblies.

#### 1.5 SUBMITTALS

- A. Product Data: Submit data for proprietary materials and items, including the following:
1. Reinforcement and forming accessories
  2. Admixtures
  3. Patching compounds
  4. Waterstops
  5. Joint systems

6. Curing compounds
  7. Dry-shake finish materials
  8. Others items as requested by Commissioner.
- B. Shop Drawings; Reinforcement: Submit original shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Details and Detailing of Concrete Reinforcement" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures. The shop drawings shall be prepared only by competent detailers, signed and stamped by a Professional Engineer licensed in the state of New York, and checked by the contractor prior to submission.
1. The shop drawings shall show construction, contraction and isolation joint locations and the added reinforcement required at same.
  2. Obtain and coordinate information for sleeves and openings in concrete, which are required for the work of other trades. Make coordinated drawings showing size and location of openings and sleeves and incorporate this information on the reinforcing drawings.
  3. Only those splices indicated on the approved shop drawings will be permitted.
  4. Provide elevations of all foundation walls and other structural elements to a minimum 1/4" scale.
- C. Shop Drawings Formwork: Submit shop drawings for fabrication and erection of specific finished concrete surfaces. Show form construction including jointing, special form joint or reveals, location and pattern of form tie placement, and other items which affect exposed concrete visually. Commissioner's review is for general architectural applications and features only. Design of formwork for structural stability and efficiency is Contractor's responsibility, prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.
1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.
- D. Shop Drawings Slab Coordination: Submit shop drawings for all new concrete slabs, including their finished elevations, indents, openings and MEP coordination (penetrations, subgrade runs, etc.).
- E. Contraction Joint Layout: Indicate proposed contraction joints required per applicable codes and drawings.
1. Location of contraction joints is subject to approval of the Commissioner.
- F. Samples: Submit samples of materials as requested by Commissioner, including names, sources and descriptions.
- G. Laboratory Test Reports: Submit laboratory test reports for concrete materials, mix design test and microwave test.
- H. Material Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Commissioner. Manufacturer and Contractor,

certifying that each material item complies with, or exceeds, specified requirements shall sign material certificates. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

- I. Cold Weather and Hot Weather Concreting Procedures: Submit written descriptions of contractor's proposed cold weather and hot weather concreting procedures, when applicable.
- J. Certification that pozzolanic materials conforms to ASTM C 618-01 (noting class C or class F), ASTM C 989 or ASTM C1240.
- K. Certified recycled steel content. Provide cut sheets clearly indicating whether the rebar used meets the minimums for post-consumer OR post-industrial recycled contents. Or, if cut sheets are not available, obtain a written affidavit from the manufacturer stating the recycled content percentage and if the recycled content is post-consumer or post-industrial.
- L. Formwork: Specify whether reusable, permanent, salvaged or new wood forms are to be used.
- M. Recycled Aggregate: Provide laboratory reports indicating that aggregate conforms to ASTM C33 for structural concrete or ASTM D1241-00 for sub-base material. Provide cut sheets clearly indicating the source, total weight and volume of the recycled aggregate. If aggregate provided is a mix of virgin and recycled aggregates obtain a written affidavit from the manufacturer stating the recycled content percentage
- N. VOC content for curing compounds, sealants and release agents: Provide a cut sheet and a Material Safety Data Sheet (MSDS) for each curing compound, sealant, hardener and release agent used highlighting VOC contents. VOC content must be less than or equal to limits stated under "PRODUCTS".

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
- D. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:
  - 1. New York City Building Code, Latest Edition
  - 2. ACI 117 "Standard Specifications for Tolerances for Concrete Construction and Materials and Commentary."

3. ACI 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight and mass concrete."
  4. ACI 211.2, "Standard Practice for Selecting Proportions for Structural Lightweight Concrete."
  5. ACI 214R, "Evaluation of Strength Test Results of Concrete."
  6. ACI 232.2R, "Use of Fly Ash in Concrete."
  7. ACI 233R, "Guide to Use of Slag Cement in Concrete and Mortar."
  8. ACI 234, "Guide for the Use of Silica Fume in Concrete."
  9. ACI 301 "Specifications for Structural Concrete."
  10. ACI 302.1R "Guide for Concrete Floor and Slab Construction."
  11. ACI 304R, "Guide for Measuring, Mixing, Transporting and Placing Concrete."
  12. ACI 305R "Hot Weather Concreting."
  13. ACI 306.1-90 "Standard Specification for Cold Weather Concreting."
  14. ACI 308.1 "Standard Specification for Curing Concrete."
  15. ACI 309R, "Guide for Consolidation of Concrete."
  16. ACI 311.4R, "Guide for Concrete Inspections."
  17. ACI 315, "Details and Detailing of Concrete Reinforcement."
  18. ACI 318 "Building Code Requirements for Structural Concrete and Commentary."
  19. ACI 347 "Guide to Formwork of Concrete."
  20. Concrete Reinforcing Steel Institute, (CRSI) "Manual of Standard Practice."
  21. CRSI-WCRSI, "Placing Reinforcing Bars."
  22. AWS D1.4, "Structural Welding Code Reinforcing Steel."
  23. The ACI Field Reference Manual, SP-15 shall be kept at the job site, and the practices set forth therein shall be strictly adhered to.
  24. ASTM Standards as applicable in the building code of the local jurisdiction and as noted in this specification.
- E. Concrete Testing Service: Engage a testing laboratory acceptable to the Commissioner to perform material evaluation tests and to design concrete mixes.
- F. Materials and installed work may require testing and retesting at anytime during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense.

#### 1.7 PROJECT CONDITIONS

- A. The Contractor, before commencing work, shall examine all adjoining work on which this work is in any way dependent for proper installation and workmanship according to the intent of this specification, and shall report to the Commissioner any condition which prevents this contractor from performing first class work.
- B. Protection of Footings Against Freezing: Cover completed work at footing level with sufficient temporary or permanent cover as required to protect footings and adjacent subgrade against possibility of freezing; maintain cover for time period as necessary.
- C. Protect adjacent finish materials against spatter during concrete placement.

- D. Provide all barricades and safeguards at all pits, holes, shaft and stairway openings, etc., to prevent injury to workmen and others within and about the premises. Also provide all safeguards as required by the Building Code, OSHA, or any other departments having jurisdiction. Take full responsibility for all safety precautions and methods.
  - E. Procedure of Work: The contractor shall keep himself constantly informed as to the progress of the work in the field, materials and men ready to start work immediately when conditions of preceding work are available or ready, wholly or in part, so as not to delay the progress of building work or to interfere with the progress of work of other contractors, and in any event he shall, within 24 hours after notice from the City of New York, proceed with such work as directed to maintain the uninterrupted progress of the work.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
  - B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

## PART 2 - PRODUCTS

### 2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct of Melamine-faced plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient strength and thickness to withstand pressure of newly placed concrete without bow or deflection.
  - 1. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better mill oiled and edge-sealed, with each piece bearing legible inspection trademark.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Preference shall go to salvaged or re-used Dimensional Lumber. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Sustainability Requirements For Wood Used For Formwork
  - 1. Salvaged or re-used Dimensional Lumber for Formwork: Provide documentation certifying products are from salvaged wood sources. Provide grading certificate for structural applications. For wood salvage wood resources see GreenSpec.
- D. Form Coatings: Provide VOC compliant commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces. Use

biodegradable form release agent listed below or equivalent made from soy or rapeseed oil.

- |    |                             |                                 |
|----|-----------------------------|---------------------------------|
| 1. | "Bio-Release EF"            | Dayton Superior                 |
| 2. | "Soy Form Away"<br>Products | Cure & Seal by Natural Soy      |
| 3. | "Bio-Form"                  | Leahy-Wolf Company              |
| 4. | "Duogard II"                | W. R. Meadows, Inc.             |
| 5. | "Atlas Bio-Guard"           | Atlas Construction Supply, Inc. |
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Form Ties: Form ties and spreaders: prefabricated assemblies by Richmond; Superior, Dayton or approved equal. Wire ties shall not be used. Ties for foundation work shall be of snap design with removal cones and water seal washer.
1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
  2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
  3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

## 2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60.
- B. Epoxy-Coated Reinforcing Bars and Wire Welded Fabric: ASTM A 775 (as noted on plan and/or in section).
- C. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- D. Welded Wire Fabric: ASTM A 185, welded steel wire fabric, Galvanized.
- E. Welded Deformed Steel Wire Fabric: ASTM A 497, Galvanized.
- F. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- G. Epoxy-Coated Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars, ASTM A 775/A 775M epoxy coated.
- H. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.
- I. Supports for Reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications.

1. For epoxy coated reinforcement provide plastic protected chairs and plastic ties. All imperfections in the epoxy coating are to be repaired prior to placement of concrete.
  - a. Use recycled plastic rebar supports. Subject to compliance with requirements, provide one of the following:
    - 1) International Plastics Group
    - 2) Eclipse Plastic
2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class I) or stainless steel protected (CRSI, Class 2), at a spacing not to exceed 4'-0" on center in either direction.

### 2.3 CONCRETE MATERIALS

- A. Portland cement: ASTM C 150, Type I. Total percentage of Portland Cement is NOT to exceed 75% of the cementitious mix. Use one brand of cement throughout project, unless otherwise acceptable to Commissioner.
  1. Fly Ash: Cast-in-place concrete shall incorporate fly ash as a replacement for at least 25% (by weight) of the Portland cement. All design mixes must be reviewed and approved by the Commissioner. Fly Ash shall not be used in conjunction with Ground Granulated Blast Furnace Slag.
  2. Ground Granulated Blast Furnace Slag (GGBF): Cast-in-place concrete shall incorporate GGBF as a replacement for at least 40% (by weight) of the Portland cement. All design mixes must be reviewed and approved by the Commissioner. GGBF shall not be used in conjunction with Fly Ash.
  3. Pozzolans and Slags: These must be completely accounted for in the design mix. Mix design must meet minimum design requirements set in the contract documents. Additional admixtures may be required to meet early strength requirements and alternative cementitious material goals. If a "blended cement" is used which already contains a certain percentage of Pozzolans or Slags this content may offset or entirely satisfy the minimum percentage required.
    - a. Coal Fly Ash: ASTM C 618 (Class C or Class F): ASTM C 618 (Note: Class F fly Ash will require higher amounts of air entraining admixtures than class C).
    - b. Blast Furnace Slag: ASTM C989
    - c. Silica Fume: ASTM C 1240
    - d. Rice Hull (or "husk") Ash: ASTM C 618 Blended hydraulic cement, as defined by ASTM C 595 or ASTM C 1157
- B. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.



1. Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Commissioner.
  2. Normal weight Fine Aggregate: washed, inert, natural or manufactured or combination thereof, sand conforming ASTM C33 gradation.
  3. Normal weight Coarse Aggregate: well graded crushed stone or washed gravel conforming to ASTM C33, sizes 57 for foundations and 67 for slabs and structure.
    - a. Recycled crushed concrete aggregate in concrete mixes is only to be used with approval of Commissioner. Recycled aggregate shall be used only as a substitute for coarse aggregate and must also be washed and well-graded, conforming to ASTM C33.
    - b. For sub-base, slabs on grade and non-structural applications and Recycled Aggregate Materials are NOT required to meet the ASTM C 33 standard. In addition to concrete rubble, glass, porcelain, and tire chips can be used as filler material. Any inert material conforming to ASTM D1241 is acceptable for the applications described in this paragraph.
- C. Water: Free from oils, acids, alkali, organic matter and other deleterious material to conform to ASTM C94. ASTM C94 for gray water use in the production of ready mixed concrete per approval by the Commissioner.
- D. Air-Entraining Admixture: Any material proposed for use as an air-entraining admixture should be tested in conformance with ASTM C 260.
1. Liquid air-entrainment: Use only agents derived from salts of wood resins. Select from products listed below or approved equal conforming to ASTM C-260.
 

a.	"Airmix"	Euclid Chemical
b.	"Darex AEA"	W. R. Grace
c.	"MB-VR"	Master Builders
- E. Water-Reducing Admixture: ASTM C 494.
1. Products: Subject to compliance with requirements, provide one of the following:
 

a.	"Polyheed 997"	Master Builders
b.	"Euclid MR"	Euclid Chemical
c.	"WRDA 64"	W. R. Grace.
- F. High-Range Water-Reducing Admixture (Superplasticizer): ASTM C 494, Type F or Type G and containing not more than 0.05 percent chloride ions.
1. Products: Subject to compliance with requirements, provide one of the following:
 

a.	"Eucon 37, 1037 or Plastol 5000"	Euclid Chemical Co.
b.	"Rheobuild 1000"	Master Builders
c.	"Glenium 7500"	Master Builders
d.	"Daracem-100"	W. R. Grace

- G. Water Reducing, Non-Corrosive Accelerating Admixture: The admixture shall conform to ASTM C 494, Type C or E, and not contain more chloride ions than are present in municipal drinking water. The admixture manufacturer must have long-term non-corrosive test data from an independent testing laboratory (of at least a year's duration) using an acceptable accelerated corrosion test method such as that using electrical potential measures. Accelerating admixtures are not to be used as antifreeze agents. Accelerating admixtures are permitted only upon review by Commissioner.
1. Products: Subject to compliance with requirements, provide the following:
    - a. "Accelguard 80" Euclid Chemical Co.
    - b. "Daraset" W. R. Grace
    - c. "Pozzutec 20" Master Builders.
- H. Water-Reducing, Retarding Admixture: ASTM C 494, Type D, and contain not more than 0.05 percent chloride ions.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Eucon Retarder 75" Euclid Chemical Co.
    - b. "Pozzolith 100XR" Master Builders.
    - c. "Plastiment" Sika Chemical Co.
    - d. "Daratard" W.R. Grace.
- I. Microsilica Admixture shall be dry densified or slurry formed. Microsilica shall come from the same source throughout the project. If a single source cannot be maintained, laboratory testing of each new source shall be required before acceptance by the Commissioner at no cost to the City of New York.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Emsac F 100" Elkem Chemical, Inc.
    - b. "Eucon MSA" Euclid Chemical Co.
    - c. "Force 10,000" W. R. Grace
- J. Prohibited Admixtures: Calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions are not permitted.
- K. Certification: Written conformance to the above-mentioned requirements and the chloride ion content of admixtures will be required from the admixture manufacturer prior to mix design review by the Commissioner.
- L. Macro-Fibers: Engineered macro-synthetic fibers.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Tuf-Strand SF" Euclid Chemical Co.
    - b. "Fibermesh 650" Propex Concrete Systems
    - c. "Forta-Ferro" Forta

M. Micro-Fibers: Engineered micro-synthetic fibers.

1. Products: Subject to compliance with requirements, provide the following:

- |    |                  |                         |
|----|------------------|-------------------------|
| a. | "Fiberstrand N": | Euclid Chemical Co.     |
| b. | "Fibermesh 150": | Propex Concrete Systems |
| c. | "Ultra-Net"      | Forta                   |

N. Natural Fiber Reinforced Concrete: Natural fiber reinforced concrete is permitted only upon review by Commissioner. Refer to ACI 544.1R, chapter 5

O. Corrosion Inhibitor: 30% calcium nitrite (where called for in the specifications or on the drawings). Subject to compliance with requirements, provide the following at 3 gal/cy:

- |    |                 |                  |
|----|-----------------|------------------|
| 1. | "Eucon CIA      | Euclid Chemical  |
| 2. | "DCI"           | W. R. Grace      |
| 3. | "Rheocrete CNI" | Master Builders. |

P. Contractor will be required to provide information demonstrating successful use in prior placement involving all admixtures.

## 2.4 WATERSTOPS

A. Flexible Rubber Waterstops: CE CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- |    |                         |
|----|-------------------------|
| a. | Greenstreak             |
| b. | Williams Products, Inc. |

2. Profile: As indicated  
3. Dimensions: 6 inches by 3/8 inch thick; nontapered.

B. Flexible PVC Waterstops: CE CRD-C 572, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- |    |                              |
|----|------------------------------|
| a. | BoMetals, Inc.               |
| b. | Greenstreak                  |
| c. | Paul Murphy Plastics Company |
| d. | Vinylex Corp.                |

2. Profile: As indicated.  
3. Dimensions: 6 inches by 3/8 inch thick; nontapered.

- C. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).

1. Products: Subject to compliance with requirements, provide one of the following:

- a. Carlisle Coatings & Waterproofing, Inc.; MiraSTOP
- b. CETCO; Volclay Waterstop-RX
- c. Concrete Sealants Inc.; Conseal CS-231
- d. Greenstreak; Swellstop
- e. Henry Company, Sealants Division; Hydro-Flex
- f. JP Specialties, Inc.; Earth Shield Type 20

## 2.5 GROUT

- A. Non-Shrink, Non-Metallic Grout: The non-shrink grout shall be a factory pre-mixed grout and shall conform to ASTM C1107, "Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink)." In addition, the grout manufacturer shall furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95% bearing under a 4' x 4' base plate.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. "Euco-NS" Euclid Chemical Co.
- b. "Five Star Grout" U.S. Grout Corp.
- c. "Masterflow 713" BASF

- B. High Flow Grout: Where high fluidity and/or increased placing time is required, use high flow grout. The factory pre-mixed grout shall conform to ASTM C1107, "Standard Specification for Packages Dry, Hydraulic-Cement Grout (Non-shrink)." In addition, the grout manufacturer shall furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95% bearing under a 18" x 36" base plate.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. "Euco Hi-Flow Grout" Euclid Chemical Co.
- b. "Masterflow 928" BASF
- c. "Five Star Fluid Grout 100" Five Star

## 2.6 RELATED MATERIALS

- A. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 1241, Size 57, with 100 percent passing a 1-1/2 inch sieve and 0 to 5 percent passing a No. 8 sieve.
- B. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 1241, Size 10, with 100 percent passing a 3/8 inch sieve, 10 to 30 percent passing a No. 100 sieve,

- and at least 5 percent passing No. 200 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.
- C. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- D. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Waterproof paper
    - b. Polyethylene film
    - c. Polyethylene-coated burlap
- E. Curing Compounds: The compound shall conform to ASTM C 309. Limit VOC content to 130 g/L. Use water-based curing compound. For surfaces receiving both a curing compound and additional flooring, verify that the curing compound and additional flooring are compatible.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. SealTight 1100 W.R. Meadows
    - b. Kurez W VOX Euclid Chemical Co.
    - c. Luster Seal WB STD Euclid Chemical Co.
    - d. VOCOMP-25 W.R. Meadows
- F. Evaporation Retardant:
1. Products Subject to compliance with requirements, provide one of the following:
    - a. "Eucobar" Euclid Chemical Co.
    - b. "Confilm" BASF
- G. Certify that all curing compounds, sealers and hardeners are compatible with all adhesive products intended for attaching co-lateral floor material. In conformance with ASTM F 710, coordination with flooring manufacturer is required to insure concrete coatings will not obstruct the bond between the concrete and the adhesive. Insure coatings and adhesives are "benignly compatible" -- in other words, do not combine substances whose constituents are reactive. Reactivity releases VOCs and /or other toxic fumes.
- H. Crack Sealer: Elastomeric liquid crack sealer resistant to water, gasoline, oil and salts.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Plasti-seal" Euclid Chemical Co.
    - b. Or Equal

- I. Flowable Underlayment: Cementitious, flowable, self-leveling concrete. Minimum compressive strength at 28 days shall be 4,000 psi.
1. Products: Subject to compliance with requirements, provide the following:
- a. "Ardex K-15" Ardex, Inc.
  - b. "Firm Fill 4010" Hacker Industries, Inc.
  - c. "Level-Right Plus" Maxxon Corp.
  - d. "Levelrock Proflow" United States Gypsum Co
- J. Bonding Admixture: The compound shall be a latex, non-rewettable type.
1. Products: Subject to compliance with requirements, provide one of the following:
- a. "Flex-Con" Euclid Chemical Co.
  - b. "Daraweld C" W.R. Grace
  - c. "SBR Latex" Euclid Chemical Co.
- K. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- L. High Strength Polymer Repair Mortar: For form and pouring or large horizontal repairs, provide the flowable on-part, high strength repair mortar.
1. Products: subject to compliance with requirements, provide the following:
- a. "Eucocrete" The Euclid Chemical Co.
  - b. "Euco Speed MP" (Cold Weather) The Euclid Chemical Co.
  - c. "Emaco R" Master Builders.
- M. Reglets: Fabricate reglets of not less than 0.022 inch thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- N. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
- O. Expansion Anchor for Anchorage to Concrete: Steel stud type, sized as shown, complying with ASTM A510, zinc plated in accordance with ASTM B633.
1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
- a. "Kwik Bolt II," Hilti Corp.
  - b. "Rawl-Stud," Rawlplug Company
  - c. "Red-Head Expansion Bolt," ITW Ramset/Red-Head Co.
- P. Adhesive Anchor for Anchorage to Concrete or Concrete Masonry:

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

- a. "HVA System," Hilti Corp.
- b. "Foil-Fast System," Rawlplug Company
- c. "Epcon System," ITW Ramset/Red-head Co.

Q. Vapor Barrier: Provide vapor barrier which conforms to ASTM E 1745, Class A or B. The membrane shall have a water-vapor permeance rate no greater than 0.012 perms when tested in accordance with ASTM E 154, Section 7. The vapor barrier shall be placed over prepared base material where indicated below slabs on grade. Vapor barrier shall be no less than 10 mil thick in accordance with ACI 302.1R. Preferred vapor barriers will be manufactured from post-consumer recycled polymers.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. "Stego Wrap (15 mil) Vapor Barrier" Stego Industries LLC
- b. "Griffolyn Vaporguard" Reef Industries
- c. "Premoulded Membrane with Plastmatic Core" W.R. Meadows.

R. Expansion Joint Filler: ASTM D 1751.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. "Homex 300" Homasote Company
- b. "Standard Cork Expansion Joint Filler" A.P.S. Cork
- c. "Fibre Expansion Joint" W.R. Meadows

S. Water: Potable.

T. Accessories:

1. Abrasive Stair Nosing: Stair nosing shall be cast aluminum with #24 virgin grain Silicon Carbide granules embedded into the walking surface while the matrix is in a molten state. Nosings shall terminate not more than 3" from ends of steps for poured concrete stairs. Nosings shall be furnished with wing anchors, bolts and nuts or concealed cast anchors. All metals shall be furnished in natural metal finish.

- a. Manufacturer: Balco (P-200), American Safety Tread Company (Type FA-211D), or Safe-t-metal Co. (AX style).
- b. Color of nosing material to be selected from manufacturer's standard colors by Commissioner.

## 2.7 PROPORTIONING AND DESIGN OF MIXES

- A. Form TR3: Technical Report Concrete Design Mix: The contractor shall 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.
- B. Preparation of Design Mixes
1. All mix designs shall be proportioned in accordance with Section 5.3, "Proportioning on the Basis of Field Experience and/or Trial Mixtures" of ACI 318 and prepared by a licensed testing laboratory approved by the City of New York, but paid for by the contractor. Submit mix designs on each class of concrete for review.
  2. If previously used mixes are submitted, all materials shall be from the same sources and with the same brand names as the previously utilized mix.
  3. If trial batches are used, the mix design shall be prepared by an independent testing laboratory and shall achieve an average compressive strength 1200 psi higher than the specified strength. This over-design shall be increased to 1400 psi when concrete strengths of 5000 or more are used.
  4. The proposed mix designs shall be accompanied by complete standard deviation analysis or trial mixture test data.
- C. Submit each proposed mix to the Commissioner for review at least 5 days prior to the pre-concrete conference. Do not begin concrete production until Commissioner has reviewed and approved mixes.
1. Submit Test reports for any pozzolans or slags indicating compliance with ASTM C 618 or ASTM C 989, respectively.
  2. Provide cut sheets clearly indicating the percentages of pozzolans or slags used in the mix design as replacement for Portland cement. Or, if cut sheets are not available, obtain a written affidavit from the manufacturer stating the percentage.
  3. Test reports for recycled aggregate indicating compliance with ASTM C 33. Provide cut sheets clearly indicating the percentage of aggregates used that are recycled. Or, if cut sheets are not available, obtain a written affidavit from the manufacturer stating the recycled content percentage and source or sources of the material.
  4. Provide cut sheets clearly indicating the percentage of sub-base and filler aggregate materials that are recycled. Or, if cut sheets are not available, obtain a written affidavit from the manufacturer stating the recycled content percentage and source or sources of the material.
- D. Design mixes to provide concrete with strength as indicated on drawings and schedules.
- E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to City of New York and as accepted by Commissioner. Laboratory test data for revised mix



design and strength results must be submitted to and accepted by Commissioner before using in work.

F. Admixtures:

1. Use water-reducing admixture or high range water-reducing admixture (superplasticizer) in all concrete as required for placement and workability.
2. Use non-corrosive, non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50°F (10°C).
3. Use high-range water-reducing admixture in pumped concrete, architectural concrete, parking structure slabs, fiber concrete, concrete required to be watertight, concrete with ultimate strength of 5,000 psi or more, and concrete with water/cement ratios below 0.50.
4. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus-or-minus 1-1/2 percent within following limits:
  - a. Concrete structures and slabs exposed to freezing and thawing or deicer chemicals.
    - 1) 4.5 percent (moderate exposure); 5.5 percent (severe exposure) 1-1/2" max. aggregate 4.5 percent (moderate exposure); 6.0 percent (severe exposure) 1" max. aggregate.
    - 2) 5.0 percent (moderate exposure); 6.0 percent (severe exposure) 3/4" max. aggregate.
    - 3) 5.5 percent (moderate exposure); 7.0 percent (severe exposure) 1/2" max. aggregate.
  - b. Other Concrete: (not exposed to freezing, thawing, or hydraulic pressure): 2 percent to 4 percent air.
  - c. Interior concrete subjected to vehicular traffic: 3 percent maximum.
5. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.

G. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:

1. Concrete for precast slabs, precast beams, structural topping slab, caisson caps, caissons, poured in place slabs and grade beams, columns and walls, over water, on ground or exposed to weather: W/C 0.40.
2. Concrete on metal deck:
  - a. With specified minimum compressive strength not greater than 5,000 psi: 0.40.
  - b. With specified minimum compressive strength not greater than 7,000 psi: 0.35.
3. "Quick Dry" Concrete: 0.40.

4. Subjected to freezing and thawing; W/C 0.50.
  5. Subjected to deicers/watertight: W/C 0.45.
  6. Reinforced concrete subjected to brackish water, salt spray or deicers; W/C 0.40.
- H. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Ramp slabs and sloping surfaces: Not more than 3".
  2. Reinforced foundation systems, including mud slabs below hydrostatic slabs: Not less than 1" and not more than 3".
  3. Concrete containing HRWR admixture (superplasticizer): Not more than 9" unless otherwise approved by the Commissioner. The concrete shall arrive at the job site at a slump of 2" to 3" (3" to 4" for concrete receiving a "shake-on" hardener or lightweight concrete), be verified, then the high-range water-reducing admixture added to increase the slump to the approved level.
  4. Other Concrete: Not less than 1" or more than 4".
- I. Chloride Ion Level: Chloride ion content of aggregate shall be tested by the laboratory making the trial mixes. The total chloride ion content of the mix including all constituents shall not exceed the limitations set forth in Table 4.4.1 of ACI 318 for concrete subjected to deicers or exposed to chloride in service (0.15% chloride ions by weight of cement).

## 2.8 CONCRETE MIXING

- A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.
- B. Provide batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.
- C. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required. When air temperature is between 85°F (30°C) and 90°F (32°C), reduce maximum mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F (32°C), reduce maximum mixing and delivery time to 60 minutes.
- D. No water shall be added after mixing to concrete containing HRWR (Superplasticizer). If loss of slump occurs, the concrete treated with HRWR may be redosed as long as a "flash set" has not occurred. Redosage procedures must be discussed and approved by the Commissioner and the manufacturer.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

### 3.2 INSPECTION

- A. Examine all work prepared by others to receive work of this section and report any defects affecting installation to the Contractor for correction. Commencement of work will be construed as complete acceptance of preparatory work by others.

### 3.3 CONCRETE

- A. Concrete shall develop the minimum compressive strengths shown on drawings at 28 days when sampled and tested in accordance with ASTM C 31 and C 39 with the maximum slump in accordance with the approved mix design.
- B. Concrete shall be in accordance with the requirements and specifications of "Building Code Requirements for Structural Concrete" as modified by the building code noted above.
- C. Fly Ash Concrete & Slag Concrete: Concrete mixes containing high volumes of fly ash or Slag have slower set times and may take up to 56 days to reach full strength. The Commissioner, agency responsible for concrete mix design, and the concrete subcontractor must coordinate to ensure that the form stripping schedule is consistent with the ability of the structure to support itself and all imposed construction loads.

### 3.4 FORMS

- A. Design formwork to maximize its reusability, reduce resources devoted to formwork construction and minimize waste generated. Where appropriate choose alternative formwork systems (refer to sections listed above).
- B. Design, erect, support, brace and maintain formwork to support vertical and lateral, static, and dynamic loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shapes, alignment, elevation and position. Maintain formwork construction tolerances complying with ACI 347. Provide Class A tolerances for concrete exposed to view. Provide Class C tolerances for other concrete surfaces.
- C. Design formwork to be readily removable without impact, shocks or damage to cast-in-place concrete surfaces and adjacent materials.
- D. Construct forms to size shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, recesses, and the like, to prevent swelling and for easy removal.

- F. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
- G. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- H. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.
- I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retightening forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

### 3.5 VAPOR BARRIER INSTALLATION

- A. Examine the condition of porous fill and remedy any unsatisfactory portions prior to installing vapor barriers.
- B. Sub-base material to be per above sections.
- C. Following leveling and tamping of sub-base for slabs on grade, cover with granular material and compact to depth as shown on drawings.
- D. After placement for granular material, place vapor barrier sheeting with longest dimension parallel with direction of pour.
- E. Lap joints 6" and seal with appropriate tape.
- F. Avoid cutting or puncturing vapor barrier during reinforcement placement and concreting operations.

### 3.6 PLACING REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials, which reduce or destroy bond with concrete.
- C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
- D. Place reinforcement to obtain at least minimum coverage's for concrete protection. Arrange, space and securely tie bars and bar supports to hold

reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

- E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
- F. Micro-Fibers: All concrete where indicated on the drawings shall contain the specified micro-fibers. Length shall be per the manufacturer's specification. The dosage rate shall be 1.0 – 1.6 lbs per cubic yard per the manufacturer's specification. Submit proposed dosage rate to Commissioner for review prior to concrete placement.
- G. Macro-Fibers: All concrete where indicated on the drawings shall contain the specified macro-fibers. Length shall be per the manufacturer's specification. The dosage rate shall be 3.0 – 5.0 lbs per cubic yard per the manufacturer's specification. Submit proposed dosage rate to Commissioner for review prior to concrete placement.
- H. Epoxy-coated reinforcing bars supported from formwork shall rest on coated wire bar supports. Reinforcing bars used as support bars shall be epoxy-coated. In walls having epoxy-coated reinforcing bars, spreader bars where specified by the Commissioner, shall be epoxy-coated. Proprietary combination bar clips and spreaders used in walls with epoxy-coated reinforcing bars shall be made of corrosion-resistant material.
- I. Epoxy-coated reinforcing bars shall be fastened with nylon- , epoxy- , or plastic-coated tie wire, or other acceptable materials.
- J. Repair of damaged epoxy-coating: When required, damaged epoxy-coating shall be repaired with patching material conforming to ASTM A775. Repair shall be done in accordance with the patching material manufacturer's recommendations.
- K. Unless permitted by the Commissioner, epoxy-coated reinforcing bars shall not be cut in the field. When epoxy-coated reinforcing bars are cut in the field, the ends of the bars shall be coated with the same material used for repair of coating damage.

### 3.7 JOINTS

- A. Construction Joints: Locate and install construction joints as indicated, or if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Commissioner.
- B. Provide keyways at least 1-1/2" deep in construction joints in walls, slabs and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.
- C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints, except as otherwise indicated.

- D. Waterstops: Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Make provisions to support and protect exposed waterstops during progress of work. Fabricate field joints in waterstops in accordance with manufacturer's printed instructions, using manufacturer's specified welding irons.
- E. Isolation Joints in Slabs-on-Ground: Construct isolation joints in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals and elsewhere as indicated.
  - 1. Joint filler and sealant materials are specified in the section for "Related Materials"
- F. Contraction (Control) Joints in Slabs-on-Ground: Maximum joint spacing shall be 36 times the slab thickness unless otherwise noted on the drawings. The dry cut saw shall be used immediately after final finishing and to a depth of 1-1/4". A conventional saw shall be used as soon as possible without dislodging aggregate and to a depth of 1/4 slab thickness.
  - 1. Joint sealant material is specified in the section for "Related Materials".

### 3.8 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.
- C. Embedded Plates at Foundation Walls: Install plate at top of forms so that exterior face of steel plate is level and plumb. Use construction documents for locations, sizes and elevations.

### 3.9 PREPARATION OF FORM SURFACES

- A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.
- B. If form-release compound is required, coat contact surfaces of forms with a form-coating compound *before* reinforcement is placed.
- C. Thin form-coating compounds only with thinning agent of type, and amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in- place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
- D. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

### 3.10 CONCRETE PLACEMENT

- A. Ready-mix concrete shall comply with the requirements of ASTM C 94 and ACI 304. All plant and transporting equipment shall comply with the concrete plant standards and truck mixer and agitator standards of the National Ready Mix Concrete Association.
- B. Cold weather mixing procedures shall be submitted to the Commissioner for approval.
- C. Notify Commissioner and the City of New York's Inspector at least 36 hours (1 1/2 regular working days) before each pour so that forms and reinforcing may be examined. Do not place concrete until inspection has been made or waived.
- D. Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
  - 1. Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.
- E. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.
  - 1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
- F. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 18" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints. Use internal vibrators penetrating both the top and preceding layers.
- G. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.
- H. Use and type of vibrators shall conform to ACI 309 "Recommended Practice for Consolidation of Concrete." Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and

complete embedment of reinforcement and other embedded items without causing segregation of mix.

- I. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
- J. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
- K. Slabs: Bring slab surfaces to correct level with straightedge and strikeoff. Use highway straightedge, bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations. See also "MONOLITHIC SLAB FINISHES" below.
- L. Maintain reinforcing in proper position during concrete placement operations.
- M. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.
  1. When air temperature has fallen to or is expected to fall below 40°F (4°C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50°F (10°C), and not more than 80°F (27°C) at point of placement.
  2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  3. Use only a non-corrosive, non-chloride accelerator. Calcium chloride, thiocyanates or admixtures containing more than 0.05% chloride ions are NOT permitted.
  4. Care must be taken to store water-based curing and sealing compounds where they will not freeze. In most cases, they cannot be reconstituted after thawing.
- N. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
  1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90°F (32°C). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
  2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
  3. Fog spray forms, reinforcing steel and subgrade just before concrete is placed.



### 3.11 FINISH OF FORMED SURFACES

- A. Concrete mixes containing pozzolans or slags do not set at the same rate or with the same bleed water characteristic as plain Portland cement. Therefore attention must be directed to the proper procedures. Refer to ACI 232.2R and ACI 301.
- B. Rough Form Finish: For formed concrete surface not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.
- C. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp-proofing, painting or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed. Follow all requirements in ACI 301, Chapter 10 for smooth form finish. Surface preparation for surfaces receiving waterproofing must be approved by the waterproofing manufacturer prior to construction.

### 3.12 FLOOR FLATNESS/LEVELNESS TOLERANCES

- A. FF defines the maximum floor curvature allowed over 24 in. Computed on the basis of successive 12 in. (300 mm) elevation differentials, FF is commonly referred to as the "Flatness F-Number".
- B. FL defines the relative conformity of the floor surface to a horizontal plane as measured over a 10 ft. (3.05 m) distance commonly referred to as the "Levelness F-Number".
- C. All floors shall be measured within 72 hours of being poured and in accordance with ASTM E 1155 "Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System (Inch-Pound Units).
- D. All slabs shall achieve the specified overall tolerance. The minimum local tolerance (1/2 bay or as designated by the Commissioner) shall be 2/3 of the specified tolerances.
- E. All elevated slabs shall achieve the specified FL tolerance before the removal of the forms.
- F. All slabs on metal deck shall achieve the specified FF.

### 3.13 MONOLITHIC SLAB FINISHES

- A. Float Finish: Apply float finish to slabs at crawl spaces, unless otherwise noted. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or

when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture. Surface shall achieve an FF 20 - FL 17 tolerance.

- B. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system, unless otherwise noted. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance and with a surface leveled to an FF 25/ FL 20 tolerance (FL17 for elevated slabs). Grind smooth surface defects, which would telegraph through applied floor covering system.
- C. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, and slab surfaces which are to be covered with membrane or elastic waterproofing, or sand-bed terrazzo, and as otherwise indicated, apply single trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming. Surface preparation for surfaces receiving waterproofing must be approved by the waterproofing manufacturer prior to construction
- D. Sealers, Hardeners and Liquid Densifiers: Apply a coat of the specified compound to all EXPOSED interior concrete floors where indicated on the drawings. This surface must be continuously moist cured by a method satisfactory to the Commissioner. Apply and mechanically scrub compound into the floor in strict accordance with the manufacturer's printed instructions.

### 3.14 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
  - 1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
  - 2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.
  - 3. In order to avoid plastic or drying shrinkage cracks during warm, dry or windy weather, ACI 302 and ACI 308 shall be followed using wind breaks and sun shades when recommended. Evaporation retardant shall be as specified in Section 2.04.
  - 4. Care must be taken to store water based curing and sealing compounds where they will not freeze. In most cases, they cannot be reconstituted after thawing.

- B. Curing Methods: Perform curing of concrete by moisture curing, moisture-retaining cover curing, curing and sealing compound, and by combinations thereof, as herein specified.
1. Provide moisture curing by following methods.
    - a. Keep concrete surface continuously wet by covering with water.
    - b. Continuous water-fog spray.
    - c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.
  2. Provide moisture-retaining cover curing as follows:
    - a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
  3. Provide curing and sealing compound to exposed interior slabs not receiving additional flooring. A clear curing and sealing compound shall be used on exterior slabs, sidewalks and curbs not receiving a penetrating sealer.
  4. Use the specified curing compound on surfaces to be covered with finish or coating material applied directly to concrete, such as liquid densifier/sealer, waterproofing, dampproofing, membrane roofing, flooring, painting, and other coatings and finish materials. Apply compound in accordance with manufacturer's direction.
- C. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- D. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of the specified curing compound or a continuous moist curing method approved by the Commissioner.
- E. Certify that all curing compounds, sealers and hardeners are compatible with all adhesive products intended for attaching co-lateral floor material. In conformance with ASTM F710, coordination with flooring manufacturer is required to insure concrete coatings will not obstruct the bond between the concrete and the adhesive. In addition, insure coatings and adhesives are "benignly compatible" -- in other words, do not combine substances whose constituents are reactive.
- F. Sealer and Dustproofer: Apply a second coat of the specified curing and sealing compound to exposed interior slabs not subjected to vehicular traffic, noted on the drawings. These slabs must have received an initial coat of the curing and sealing compound.

### 3.15 SHORES AND SUPPORTS

- A. Comply with ACI 347 for shoring and reshoring in multistory construction, and as herein specified.
- B. Extend shoring from ground to roof for structures 4 stories or less, unless otherwise permitted.
- C. Extend shoring generally at least 4 floors under floor or roof being placed for structures over 5 stories. Shore floor directly under floor or roof being placed, so that loads from construction above will transfer directly to these shores. Space shoring in stories below this levels in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members where no reinforcing steel is provided. Extend shores beyond minimums to ensure proper distribution of loads throughout structure. Contractor shall provide the services of a registered Professional Engineer to design the shoring, and determine timing of removal.
- D. Remove shores and reshore in a planned sequence to avoid damage to partially cured concrete. Locate and provide adequate reshoring to safely support work without excessive stress or deflection.
- E. Keep reshores in place a minimum of 15 days after placing upper tier, and longer if required, until concrete has attained its required 28-day strength and heavy loads due to construction operations have been removed.

### 3.16 REMOVAL OF FORMS

- A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50°F (10°C) for 12 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than 14 days and until concrete has attained design minimum compressive strength at 28-days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.
- C. Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

### 3.17 RE-USE OF FORMS

- A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

- B. When forms are intended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Commissioner.

### 3.18 MISCELLANEOUS CONCRETE ITEMS

- A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.
- D. Grout base plates and foundations as indicated using specified free-flowing non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.
- E. Where high fluidity and/or increased placing time is required use the specified high flow grout. This grout shall be used for all base plates larger than 10 square feet.
- F. Reinforced Masonry: Provide concrete grout for reinforced masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

### 3.19 CONCRETE SURFACE REPAIRS

- A. Prior to all repairs, an as-built condition sketch and method of repair must be submitted to the Commissioner for review and approval.
- B. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Commissioner.
- C. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with a bonding grout containing the specified bonding admixture. Place patching mortar after while bonding grout is still tacky.
- D. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and

color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

- E. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Commissioner. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discoloration's that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or pre-cast cement cone plugs secured in place with bonding agent.
- F. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- G. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for tureens of slope, in addition to smoothness, using a template having required slope.
- H. Repair finished unformed surfaces that contain defects, which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.
- I. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days, except at hydrostatic slabs.
- J. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. The specified underlayment compound or repair topping may be used when acceptable to Commissioner.
- K. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.
- L. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cutout holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry-pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

- M. Structural Repair: All structural repairs shall be made with prior approval of the Commissioner as to method and procedure, using the specified polymer repair mortar and/or specified epoxy adhesive. Where epoxy injection procedures must be used, an approved low viscosity epoxy made by the manufacturers previously specified shall be used. In addition, all cracks shall be filled with the specified crack sealer or other method as approved by the Commissioner. All garage slabs shall be repaired prior to the slab being treated with the specified penetrating anti-spalling sealer.
- N. Underlayment Application: Leveling of floors for subsequent finishes may be achieved by use of specified underlayment material. Underlayment application shall achieve the tolerances specified in "MONOLITHIC SLAB FINISHES" above.
- O. Specified Polymer Horizontal Repair Mortar: All exposed floors shall be leveled, where required, with the specified self-leveling repair topping.
- P. Repair Methods not specified above may be used, subject to acceptance of Commissioner.

### 3.20 FOUNDATION WALLS

- A. The contractor shall form and leave openings in walls as shown on drawings and approved shop drawings for work of other contractors. These openings shall be temporarily closed and when so directed, the contractor shall point up in solid and neat manner with waterproofed cement.

### 3.21 WORK IN CONNECTION WITH OTHER TRADES AND CONTRACTS

- A. Sleeves, pockets, openings, etc., shall be set in the concrete walls and arches as required for the mechanical trades as shown on approved shop drawings; these shall be encased or built into the concrete work and shall be properly placed and secured in position in the forms before concrete is placed.
- B. Provide all chases, pipe slots, etc., required for the mechanical trades (see mechanical drawings), constructed as shown on the approved shop drawings.
- C. Leave temporary access panels where required to install mechanical equipment as required by trade affected. Panels shall be formed with construction joints as specified. Details for such panels shall be submitted to Commissioner for approval.
- D. Coordinate all penetrations, cutting, and patching with waterproofing contractor.

### 3.22 CUTTING AND PATCHING

- A. Contractor for concrete work shall be responsible for all cutting, removing and patching work where concrete surfaces are not installed within the limits shown on the drawings or specified herein. All such work shall meet with the approval of the Commissioner.

- B. Where cutting and patching is required to accommodate the work of other subcontractors, such cutting shall be done at the expense of said subcontractors but shall be performed by the contractor for concrete work.
- C. The location and extent of cutting in completed concrete work and the patching thereof shall meet with the approval of the Commissioner.

### 3.23 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. The City of New York will employ a testing laboratory to perform tests and to submit test reports.
- B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Commissioner.
  - 1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
  - 2. Slump: ASTM C 143; one test at point of discharge for each truck; additional tests when concrete consistency seems to have changed.
  - 3. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each truck of air-entrained concrete.
  - 4. Concrete Temperature: Test hourly when air temperature is 40°F (4°C) and below, and when 80°F (27°C) and above; and each time a set of compression test specimens made.
  - 5. Compression Test Specimen: ASTM C 31; one set of 5 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
  - 6. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 25 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimens tested at 7 days, three specimens tested at 28 days, and one specimens retained in reserve for later testing if required.
    - a. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
    - b. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
    - c. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.
  - 7. Water Cement Ratio Test: Check water content of concrete in accordance with 'Standard Method of Test for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying, AASHTO



DESIGNATION: TP 23, SHRP DESIGNATION: 2027' for testing procedure.

8. Test results will be reported in writing to Commissioner and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.
  - a. Non Compliance: All test reports indicating non-compliance shall be faxed immediately to all parties on the test report distribution list and the hard copies submitted on different colored paper.
  - b. Nondestructive Testing: Windsor probes, sonoscope, or other non-destructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
9. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Commissioner. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

### 3.24 WASTE MANAGEMENT

- A. Separate and recycle waste materials in accordance with the Section 01 74 19 Construction Waste Management and to the maximum extent feasible.
- B. Collect cut off steel and discarded reinforcement steel and place in area for recycling.
- C. Place materials defined as hazardous or toxic waste in designated containers.
- D. Use trigger operated spray nozzles for water hoses and closed loop system to reduce water consumption.
- E. Reusable forms should be cleaned immediately after removal and non-reusable forms recycled to the maximum extent economically feasible.
- F. Incorporate crushed concrete or masonry materials in sub-base to the maximum extent feasible in accordance with sub-base specifications.
- G. Before concrete pours, designate location or uses for excess concrete. Options include:
  1. Additional paving
  2. Post footing anchorage
  3. Landscaping -- site concrete features
  4. Flowable fill

- H. To avoid contamination of the local landscape, before concrete pours, designate a location for cleaning out concrete trucks where run-off can be contained, reused or incorporated. Options include:
1. Company owned site for that purpose
  2. On-site area to be paved later in project

END OF SECTION

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## SECTION 03 53 00

## CONCRETE FLOOR TOPPING

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

## 1.3 SUMMARY

- A. This Section includes the following:
  - 1. Mineral-aggregate concrete floor topping.
- B. Related Sections include the following:
  - 1. Division 01 – DDC General Conditions
  - 2. Cast In Place Concrete – Section 03 30 00.
  - 3. Painting– Section 09 90 00.

## 1.4 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

- 1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:

- a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit data for all proprietary materials and items, including but not limited to reinforcement and forming accessories, admixtures, patching compounds, curing compounds waterstops and any others as requested by Commissioner. Samples of materials specified in this section shall be submitted to Commissioner for acceptance as requested by Commissioner.
- C. Mill certificates for cement.
- D. Laboratory and Test Results: Submit laboratory test reports for concrete materials and mix designs as specified in ASTM C150, ASTM C33, ASTM C40, ASTM C88, C157, ASTM C260, ASTM C494, ASTM C192, and ASTM C30 as specified in ACI 301.
- E. Concrete mix design.
- F. Mockups: Cast topping mockups to demonstrate typical joints, surface finish, bonding, texture, tolerances, and standard of workmanship.
- G. Material Test Reports: From a qualified testing agency indicating and interpreting test results of toppings for compliance with requirements indicated.
- H. Certifications: Submit to the Commissioner in triplicate copies of certifications prepared by admixture manufacturer that the admixture contains no chlorides.
- I. Minutes of preinstallation conference.

### 1.5 LEED PERFORMANCE CRITERIA

- A. Field Applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013329.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications:
  - 1. Provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly trained and experienced in placing the types of concrete specified and who shall direct all work performed under this Section.
  - 2. For finishing of exposed surfaces of the concrete, use only thoroughly trained and experienced journeyman concrete finishers.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
- C. Codes and Standards Compliance:
  - 1. Work must comply with the latest edition of the following standard specifications and codes with the modifications as specified herein, provided however, that no requirement therein shall apply if it be in conflict with any provisions of the latest edition of the N.Y. City Building Code except as otherwise noted on the Drawings or as otherwise specified:

Mockup N.Y. City Building Code - Latest Edition;

ACI 318 - Building Code Requirements for Reinforced Concrete;

ACI 301 - Specifications for Structural Concrete for Building;

ACI 302.1.R - Guide for Concrete Floor and Slab Construction.

ACI 304 - Recommended Practice for Measuring, Mixing and Placing Concrete;

ACI 315 - Manual for Standard Practice for Detailing Reinforced Concrete Structures;

ACI 306 - Recommended Practice for Cold Weather Concreting;

ACI 305 - Recommended Practice for Hot Weather Concreting;

ACI 347 - Recommended Practice for Concrete Formwork;

CRSI Handbook - Recommended Practice for Placing Reinforcing Bars;

CRSI Handbook - Recommended Practice for Placing Bar Supports, Specifications and Nomenclature;

CRSI Manual of Standard Practice;

ASTM - Applicable ASTM Standards in Building Codes;

National Ready-Mixed Concrete Association Publication: Concrete Plant Standards and Truck Mixer and Agitator Standards.

The contractor shall have a copy of each of these standards in his field office, and should be familiar with their contents as they pertain to this project.

D. Testing:

1. Testing shall be provided for all the concrete work as required by ACI 301 and New York City Building Code. However, 4 cylinders will be taken with each set, 2 will be broken at 7 days and remaining 2 at 28 days.
2. This testing work shall be done by a licensed engineer and a licensed testing laboratory, both retained and paid for by the City of New York.
3. Form TR3: Technical Report Concrete Design Mix: The contractor shall 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.

E. Mock Ups: Cast topping mockup to demonstrate typical joints, surface finish, bonding, texture, tolerances, and standard of workmanship.

1. Build mockup approximately 100 sq. ft. in the location indicated or, if not indicated, as directed by Commissioner.
2. Notify Commissioner seven days in advance of dates and times when mockup will be constructed.
3. Obtain Commissioner's approval of mockup before starting construction.
4. If Commissioner determines that mockup does not meet requirements, demolish and remove from the site and cast others until mockup is approved.
5. Maintain mockup during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockup when directed.
7. Approved mockup may become part of the completed Work if undisturbed at time of Substantial Completion.

- F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in DDC General Conditions.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage, mixing with other components, and application.
- B. Store materials to comply with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.

#### 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting topping performance.
  - 1. Place topping only when ambient temperature and temperature of base slabs are between 50 and 86 deg F.
- B. Close areas to traffic during topping application and, after application, for time period recommended in writing by manufacturer.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. General: All concrete, unless otherwise specifically permitted by the Commissioner, shall be transit-mixed in accordance with ASTM C-94.
- B. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Mineral-Aggregate Topping:
    - a. A-H Emery A-1 Premix; Anti-Hydro International, Inc.
    - b. Emery Tuff Top; Dayton Superior Corporation.
    - c. Emerytop 400; L&M Construction Chemicals, Inc.
    - d. Met-Top E; Metalcrete Industries.
    - e. Emery-Crete Topping; Sternson Group.

#### 2.2 CONCRETE FLOOR TOPPINGS

- A. Mineral-Aggregate Topping: Factory-prepared and dry-packaged mixture of graded, crushed emery aggregate containing not less than 50 percent aluminum oxide, not less than 24 percent ferric oxide, and not more than 8 percent silica; portland cement or blended hydraulic cement; plasticizers; and other admixtures to which only water needs to be added at Project site.
  - 1. Compressive Strength (28 Days): 4000 psi; ASTM C 109/C 109M.

#### 2.3 CURING MATERIALS



- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: clean, fresh and Potable.
- E. Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 25 percent solids content, minimum.
- F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 25 percent solids content, minimum.

#### 2.4 RELATED MATERIALS

- A. Epoxy Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Shore A hardness of 80 per ASTM D 2240.
- B. Joint-Filler Strips: Premolded polyethylene foam plank.
- C. Joint Sealer - Elastomeric Polyurethane.
- D. Portland Cement: ASTM C 150, Type I or II.
- E. Sand: ASTM C 404, fine aggregate passing No. 16 sieve.
- F. Water: Potable.
- G. Acrylic-Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- H. Epoxy Adhesive: ASTM C 881, Type V, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements.

#### 2.5 MIXING

- A. Bonding Slurry: Mix portland cement with water to a thick paint consistency.
- B. Bonding Slurry: Mix 1 part portland cement and 1-1/2 parts sand minimum or Portland cement to sand ratio specified by product manufacturer with water and an acrylic-bonding agent according to manufacturer's written instructions to a thick paint consistency.
- C. Topping: Mix topping materials and water in appropriate drum-type batch machine mixer or truck mixer according to manufacturer's written instructions.

### PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for conditions affecting performance of topping. Proceed with application only after unsatisfactory conditions have been corrected.
- B. Verify that base slabs meet finish and surface profile requirements in Division 3 Section "Cast-in-Place Concrete."
- C. Verify that base slabs are visibly dry and free of moisture. Test for capillary moisture by the plastic sheet method according to ASTM D 4263.

### 3.2 PREPARATION

- A. Existing Concrete: Remove existing surface treatments and deteriorated and unsound concrete. Mechanically abrade base slabs to produce a heavily scarified surface profile with an amplitude of 1/4 inch.
  - 1. Prepare and clean existing base slabs according to topping manufacturer's written instructions. Fill voids, cracks, and cavities in base slabs.
  - 2. Mechanically remove contaminants from existing concrete that might impair bond of topping.
  - 3. Saw cut existing contraction and construction joints to a depth of 1/2 inch and fill with epoxy joint filler.
- B. Install joint-filler strips where topping abuts vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
  - 1. Extend joint-filler strips full width and depth of joint, terminating flush with topping surface, unless otherwise indicated.
  - 2. Terminate full-width joint-filler strips 1/2 inch below topping surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.
  - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

### 3.3 TOPPING APPLICATION

- A. Start topping application in presence of manufacturer's technical representative.
- B. Monolithic Topping: After textured-float finish is applied to fresh concrete of base slabs, specified in Division 3 Section "Cast-in-Place Concrete," place topping while concrete is still plastic.
- C. Deferred Topping: Within 72 hours of placing base slabs, mix and scrub bonding slurry into dampened concrete to a thickness of 1/16 to 1/8 inch, without puddling. Place topping while slurry is still tacky.
- D. Existing Concrete: Apply epoxy-bonding adhesive, mixed according to manufacturer's written instructions, and scrub into dry base slabs to a thickness of 1/16 to 1/8 inch, without puddling. Place topping while adhesive is still tacky.
- E. Place topping continuously in a single layer, tamping and consolidating to achieve tight contact with bonding surface. Do not permit cold joints or seams to develop within pour strip.
  - 1. Screed surface with a straightedge and strike off to correct elevations.
  - 2. Slope surfaces uniformly where indicated.

3. Begin initial floating using bull floats to form a uniform and open-textured surface plane free of humps or hollows.
- F. Finishing: Consolidate surface with power-driven floats as soon as topping can support equipment and operator. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
1. Hard Trowel Finish: After floating surface, apply first trowel finish and consolidate topping by power-driven trowel so no blisters develop. Continue troweling passes and restraighten until surface is smooth and uniform in texture.
    - a. Finish surfaces to specified overall values of flatness, F(F) 25; and levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and levelness, F(L) 15, measured within 24 hours according to ASTM E 1155 (ASTM E 1155M) for a randomly trafficked floor surface.
    - b. Finish and measure surface so gap at any point between topping surface and an unlevelled freestanding 10-foot- long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed 1/4 inch.
- G. Construction Joints: Construct joints true to line with faces perpendicular to surface plane of topping, at locations indicated or as approved by Commissioner.
1. Coat face of construction joint with epoxy adhesive at locations where topping is placed against hardened or partially hardened topping.
- H. Contraction Joints: Form weakened-plane contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before topping develops random contraction cracks.
1. Form joints in topping over contraction joints in base slabs, unless otherwise indicated.
  2. Construct contraction joints for a combined depth equal to topping thickness and not less than one-fourth of base-slab thickness.
  3. Construct contraction joints for a depth equal to one-half of topping thickness, but not less than 1/2 inch deep.

### 3.4 PROTECTION AND CURING

- A. General: Protect freshly placed topping from premature drying and excessive cold or hot temperatures.
- B. Evaporation Retarder: Apply evaporation retarder to topping surfaces in hot, dry, or windy conditions before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying topping, but before float finishing.
- C. Begin curing immediately after finishing topping. Cure by one or a combination of the following methods, according to topping manufacturer's written instructions:
1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with absorptive cover, water saturated and kept continuously wet. Cover topping surfaces and edges with 12-inch lap over adjacent absorptive covers.
  2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in two coats in continuous operations by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

### 3.5 JOINT FILLING

- A. Prepare and clean contraction joints and install epoxy joint filler, according to manufacturer's written instructions, once topping has fully cured.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install epoxy joint filler full depth of contraction joints. Overfill joint and trim joint filler flush with top of joint after hardening.

### 3.6 DEFECTIVE WORK

- A. Inspection: Immediately after forms have been removed, the contractor shall inspect all concrete surfaces and patch all pour joints, rock pockets for ties holes and other imperfections before the concrete is thoroughly dry. Do not patch until concrete has been inspected by the Engineer.
- B. Patching:
  1. Minor defective areas shall be patched as follows:
    - a. Chip away to a depth of about one inch, leaving edges perpendicular to the surface; wet the area to be patched and a space of at least six inches wide around it to prevent water being absorbed out of the mortar.
    - b. Patching mortar shall consist of one part cement to three parts sand using water to achieve a consistency as dry as possible within the requirements of handling and placing; add one pint Chem-Master "Polyweld" to each bag cement; thoroughly compact the mortar by ramming it into place.
    - c. Screed off so as to leave the patch slightly higher than surrounding surfaces; leave undisturbed for a period of one to two hours to permit initial shrinkage, and then perform final finishing.
    - d. Finish the patch to match adjacent surfaces.
  2. Major Defective Areas: If the defects are serious and affect the strength of the structure, or if patching does not satisfactorily restore the quality and appearance of the surface, the Commissioner may require "cement gun concrete" to be used or the concrete to be removed and replaced completely in accordance with the provisions of this Section, all at no additional cost to the City of New York and to the satisfaction of the Commissioner.

### 3.7 REPAIRS

- A. Defective Topping: Repair and patch defective topping areas, including areas that have not bonded to concrete substrate.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform tests and to prepare test reports during topping placement according to requirements specified in this Article.
- B. Sample Sets: At point of placement, testing and inspecting agency shall take a set of 3 molded-cube samples from the topping mix for the first 1000 sq. ft. (93 sq. m) plus 1 set of samples for each subsequent 5000 sq. ft. (464 sq. m) of topping, or fraction thereof, but not less than 6 samples for each day's placement. Samples shall be tested according to ASTM C 109/C 109M for compliance with compressive strength requirements.

END OF SECTION

SECTION 04 20 00  
MASONRY ASSEMBLIES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of regional materials; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the masonry work as indicated on the drawings and/or specified herein including, but not limited to, the following:
  - 1. Concrete block walls.
  - 2. Salvaged brick cavity walls..
  - 3. Metal joint reinforcing, anchors, ties, weeps, pea gravel and related accessories for masonry.
  - 4. Control joints in masonry, filled with joint fillers.
  - 5. Through-wall flashing.
  - 6. Cavity drainage material.
  - 7. Chases, recesses, pockets and openings in masonry as required for installation of work by others.
  - 8. Building of items furnished by others into masonry, including access doors, door frames, anchors, sleeves and inserts, and other similar items to be embedded in masonry.
  - 9. Grouting in of metal items built into masonry work.
  - 10. Protection, painting and cleaning of masonry.

### 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Joint sealers - Section 07 92 00.

### 1.4 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product data for each different masonry unit, accessory, and other manufactured product indicated.

- C. Shop drawings for clay units showing type, dimension and location of each unit required.
- D. Shop drawing indicating control joint location and details.
- E. Shop drawings for reinforcing detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcing" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.
- F. Samples For Initial Selection Purposes of the Following
  - 1. Unit masonry samples showing full extent of colors and textures available for each different exposed masonry unit required.
  - 2. Colored masonry mortar samples showing full extent of colors available.
- G. Samples For Verification Purposes of the Following
  - 1. Full-size units for each different exposed masonry unit required showing full range of exposed color, texture, and dimensions to be expected in completed construction.
  - 2. Colored masonry mortar samples for each color required showing the full range of colors expected in the finished construction. Label samples to indicate type and amount of colorant used.
  - 3. Joint reinforcing, each type, width and proposed locations (labeled).
  - 4. Anchors, wedges and ties, each type, width and proposed locations (labeled).
  - 5. Joint filler, each type.
  - 6. Flashing, including splice sample, 12" x 12".
- H. Preconstruction Testing: Contractor shall employ and pay a qualified independent testing laboratory to perform the following preconstruction testing indicated as well as other inspecting and testing services required by referenced unit masonry standard or indicated herein for source and field quality control:
  - 1. Concrete Masonry Unit Tests: For each different concrete masonry unit indicated, units will be tested for strength, absorption, and moisture content per ASTM C 140.
  - 2. Prism Tests: For each type of wall construction indicated, masonry prisms will be tested per ASTM E 447, Method B.
  - 3. Mortar properties will be tested per property specification of ASTM C 270.
  - 4. Mortar composition and properties will be evaluated per ASTM C 780.
  - 5. Grout compressive strength will be tested per ASTM C 1019.
- I. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface of visually related surfaces.



- J. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- K. Material certificates for the following signed by manufacturer and Contractor certifying that each material complies with requirements.
  - 1. Each different cement product required for mortar and grout including name of manufacturer, brand, type, and weight slips at time of delivery.
  - 2. Each material and grade indicated for reinforcing bars.
  - 3. Each type and size of joint reinforcement.
  - 4. Each type and size of anchors, ties, and metal accessories.
- L. Material test reports from a qualified independent testing laboratory employed and paid by Contractor indicating and interpreting test results relative to compliance of the following proposed masonry materials with requirements indicated:
  - 1. Mortar complying with property requirements of ASTM C 270.
  - 2. Grout mixes. Include description of type and proportions of grout ingredients.
  - 3. Masonry units.
- M. Cold-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.
- N. Hot-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.
- O. Results from tests and inspections performed by Contractor's Testing Laboratory shall be reported promptly and in writing to the Commissioner.

#### 1.5 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.6 QUALITY ASSURANCE

- A. Conform to the following non-cumulative tolerances (any masonry work not meeting these standards shall be re-built at no additional cost to the City of New York).

1. Variations From the Plumb
  - a. In lines and surfaces of columns, wall and arrises:
    - 1). In 10 feet 1/4"
    - 2). In any story of 25 feet maximum 3/8"
    - 3). In 40 feet or more 1/2"
  2. Variation from the level or the grades indicated on the drawings; for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines:
    - a. In any bay or 20 feet maximum 1/4"
    - b. In 40 feet or more 1/2"
  3. Variation of the linear building lines from established position in plan related portion of columns and partitions:
    - a. In any bay or 20 feet maximum 1/2"
    - b. In 40 feet or more 3/4"
  4. Variations in cross-sectional dimensions of columns and in thickness of walls:
    - a. Minus 1/4"
    - b. Plus 1/2"
  5. Variation in dimensions of masonry openings:
    - a. Horizontal dimension +/- 1/8"
    - b. Vertical dimension +/- 1/8"
- B. Factory Control
  1. The Commissioner reserves the right to visit the clay unit manufacturing facilities and review pre-sorting so that all clay units fall within an acceptable color range.
  2. 4' x 4' sample panel shall be constructed at the factory using each clay unit specified. This sample panel, after approval of the Commissioner, shall become the quality control panel for the selected clay unit.
  3. Prior to any shipment of the face clay unit from the factory, the Commissioner reserves the right to inspect the clay unit for the thoroughness of the pre-sorting and to reject any clay unit which in his opinion do not fall within acceptable color range.
- C. Work of this Section shall conform to the requirements of the following:
  1. ACI 530/ASCE 5 Building Code Requirements for Masonry Structures.
  2. ACI 530-1/ASCE 6 Specifications for Masonry Structures.
- D. Pre-Construction Conference: Prior to installation of masonry and associated work, Contractor shall arrange a meeting with Masonry Subcontractor, installers of related work, and other entities concerned with masonry wall performance, including the Commissioner and City of New York. Contractor shall record discussions and agreements and furnish copy to each participant. Provide at least seventy-two (72) hours' advance notice to participants prior to convening conference. Review methods and procedures related to masonry work, including, but not limited to, the following:
  1. Review masonry requirements (drawings, specifications and other Contract Documents).

2. Review required submittals, both completed and yet to be completed.
3. Review and finalize construction schedule related to masonry work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
4. Review required inspection, testing, certifying and material usage accounting procedures.
5. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.
- C. Store cementitious materials off the ground, under cover, and in dry location.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.
- F. Pallets of clay units shall be double plastic wrapped for shipping.

#### 1.8 PROJECT CONDITIONS

- A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
  2. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that come in contact with such masonry.
  1. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
  2. Protect sills, ledges, and projections from mortar droppings.

3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.
- D. Cold-Weather Construction: Comply with referenced unit masonry standard for cold-weather construction and the following:
1. Do not lay masonry units that are wet or frozen.
  2. Remove masonry damaged by freezing conditions.
- E. Hot-Weather Construction: Comply with referenced unit masonry standard.

## PART 2 PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated.

### 2.2 CONCRETE MASONRY UNITS (CMU)

- A. General: Comply with requirements indicated below applicable to each form of concrete masonry units required.
1. Provide special shapes where indicated and as follows:
    - a. For lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
    - b. Closed end units for outside corners unless otherwise indicated.
  2. Size: Provide concrete masonry units complying with requirements indicated below for size that are manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification for concrete masonry units.
    - a. Concrete Masonry Units: Manufactured to specified dimensions of 3/8 inch less than nominal widths by nominal heights by nominal lengths indicated on drawings.
      - 1). Standard Modular: 7-5/8 inches high by 15-5/8 inches long widths as shown on drawings.
  3. Provide Type I, moisture-controlled units.
  4. Exposed Faces: Color and texture as scheduled.
  5. Integral Water Repellent: For exposed exterior units, provide units made with integral water repellent equal to "Dry-Block" as manufactured by W.R. Grace & Co., or equivalent product of ACM Chemistries, BASF, or approved equal; liquid polymeric, integral water repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested as a wall assembly made with mortar containing integral water repellent manufacturer's mortar additive according to ASTM E 514, with test period extended to 24 hours, show no visible water or leaks on the back of test specimen.

- B. Hollow and Solid Load-Bearing Concrete Masonry Units: ASTM C 90 as follows:
1. Typical Block: Anchor Block M-block / Smooth face surface block with minimal voids.
  2. Unit Compressive Strength: Provide units with minimum average net area compressive strength as indicated in Structural General Notes.
  3. Weight Classification: See Structural General Notes.
  4. Absorption: Less than 5 percent.
  5. Manufacturers:
    - a. Anchor Block, Manasquan, NJ
    - b. Genest Block, Sanford, ME
    - c. York Building Products Co., York, PA
  6. Finish: Smooth face in manufacturer's standard colors (to match Anchor MX-38).
  7. The producer of the concrete masonry units shall furnish certification from an independent testing laboratory confirming that all 8" or larger masonry units meet all of the UL-618 requirements for two (2) hours or better (as required), referencing full scale fire test reports (ASTM E 119). All 4" and 6" units shall conform to "National Bureau of Standards" and "National Research Council" full scale fire tests.
- C. Insulated Concrete Masonry Units: ASTM C578-87s, C90.
1. Products: NRG ICMU, with integral Expanded Polystyrene insert.
  2. Manufacturers:
    - a. Anchor Block, Manasquan, NJ
    - b. Trenwyth Industries, Emigsville, PA
    - c. Niagara Block Inc., Niagara Falls, ON
  3. Finish: Smooth Face, in manufacturer's standard colors (to match Anchor MX-38).
  4. Size: Face dimension of 7-5/8 inches high by 15-5/8 inches long by width required for application.
  5. Bond Pattern: Running Bond.
  6. Special Units: All insulated, web-less, concrete masonry units shall be NRG ICMU's, (Insulated Concrete Masonry Units) except corner, half, solid bottom bond beam and sash units. These "special" units shall be conventional units with finish to match and shall be interspersed into the NRG wall construction where needed, as per manufacturer's recommendations.
  7. Sealer: Integral water-repellent admixture.
- 2.3 FACE BRICK
- A. Salvaged Face Brick:
1. Salvage existing brick where noted.

2. Carefully remove mortar and brush clean in preparation for reinstallation. Reject salvaged bricks with chipped or marred exposed faces and edges.
3. Match bond pattern and mortar color, and align spacing with adjacent existing brick for continuous appearance.

#### 2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce required mortar color.
  1. For colored pigmented mortars use premixed colored Portland/Lime cement mortar of formulation required to produce color.
  2. All exposed masonry mortar shall be of color selected by Commissioner.
- B. Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this article, combined with set-controlling admixtures to produce a ready-mixed mortar complying with ASTM C 1142.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100 percent passing the No. 16 sieve.
  1. Colored Mortar Aggregates: Ground marble, granite, or other sound stone, as required to match sample approved by the Commissioner.
- E. Aggregate for Grout: ASTM C 404.
- F. Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.
- G. Water: Clean and drinkable.
- H. Products: Subject to compliance with requirements, provide one of the following:
  1. Colored Mortar
    - a. "Colorbond Custom Color Masonry Cement," Centurion.
    - b. "Atlas Custom Color Masonry Cement," Lehigh Portland Cement Co.
    - c. "Flamingo Color Masonry Cement," Capital Materials Corporation.
  2. Colored Mortar Pigments
    - a. "Centurion Pigments," Centurion.
    - b. "True Tone Mortar Colors," Davis Colors, A Subsidiary of Rockwood Industries, Inc.
    - c. "SGS Mortar Colors," Solomon Grind-Chem Services, Inc.

#### 2.5 REINFORCING STEEL

- A. General: Provide reinforcing steel complying with requirements of referenced unit masonry standard and this article.

B. Steel Reinforcing Bars: Material and grade as follows:

1. Billet steel complying with ASTM A 615.
2. Grade 60.

C. Deformed Reinforcing Wire: ASTM A 496.

D. Plain Welded Wire Fabric: ASTM A 185.

E. Deformed Welded Wire Fabric: ASTM A 497.

## 2.6 JOINT REINFORCEMENT

A. General: Provide joint reinforcement for concrete block complying with requirements of referenced unit masonry standard and this article, formed from the following:

1. Galvanized carbon steel wire, coating class as required by referenced unit masonry standard for application indicated.

B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:

1. Wire Diameter for Side Rods: 0.1483 inch (9 gage).
2. Wire Diameter for Cross Rods: 0.1483 (9 gage).
3. For single-wythe masonry provide type as follows with single pair of side rods:
  - a. Truss design with continuous diagonal cross rods spaced not more than 16 inches o.c.

C. Manufacturers: Subject to compliance with requirements, provide joint reinforcement by one of the following:

1. AA Wire Products Co.
2. Dur-O-Wal, Inc.
3. Heckman Building Products, Inc.
4. Hohmann & Barnard, Inc.
5. Masonry Reinforcing Corp. of America.
6. National Wire Products Industries.
7. Southern Construction Products, Inc.

## 2.7 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of referenced unit masonry standard and of this article.

B. Galvanized Carbon Steel Wire: ASTM A 82, coating class as required by referenced unit masonry standard for application indicated.

## C. Galvanized Steel Sheet: As follows:

1. ASTM A 526 (commercial quality), Coating Designation G60, steel sheet zinc-coated by hot-dip process on continuous lines prior to fabrication, for sheet metal ties and anchors completely embedded in mortar.
2. ASTM A 366 (commercial quality) cold-rolled carbon steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153, Class B2 (for unit lengths over 15 inches) and Class B3 (for unit lengths under 15 inches), for sheet metal ties and anchors exposed to the weather and not completely embedded in mortar and grout.

D. Galvanized Steel Sheet: ASTM A 366 (commercial quality) cold-rolled carbon steel sheet, hot-dip galvanized after fabrication to comply with ASTM A 525, CB2 (for unit lengths over 15 inches) and Class B3 (for unit lengths under 15 inches), for sheet metal ties and anchors.

E. Galvanized Heavy-Thickness Steel Sheet: ASTM A 635 (commercial quality) hot-rolled carbon steel sheet hot-dip galvanized after fabrication to comply with ASTM A 526, Class B3, for rigid anchors fabricated from steel sheet or strip with a thickness of 0.180 inch and greater.

F. Steel Plates and Bars: ASTM A 36, hot-dip galvanized to comply with ASTM A 123 or ASTM A 153, Class B3, as applicable to size and form indicated.

## 2.8 ANCHORS AND TIES

## A. For anchoring clay facing blocks to back-up masonry wall:

1. For horizontal cell facing units provide and install adjustable two wythe wall reinforcement type "Hook-It" made by Hohmann and Barnard or approved equal. Finish to be hot-dip galvanized.
  - a. Inner wythe to be truss box mesh type with 9 gauge rods.
  - b. Outer wythe to be ladder reinforcement type with 9 gauge rods.
2. For vertical units provide and install dowels and ties made by Hohmann and Barnard or approved equal. All pieces to be stainless steel (Type 302).
  - a. Half bond ties 7-5/8" x 3" x 1/4" diameter in back-up wall.
  - b. Solid 1/4" diameter x 2" long dowels.
  - c. Wire of 3/16" diameter cut to length as required.

B. For anchoring masonry to cold formed metal framing, provide hot dip galvanized steel anchors with 9 ga. wire equal to "X-Seal Veneer Anchor" with "X-Seal Tape" seals as manufactured by Hohmann & Barnard or approved equal.

## 2.9 ADJUSTABLE ANCHORS FOR CONNECTING MASONRY TO STRUCTURAL FRAMEWORK

A. General: Two-piece assemblies as described below allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it.



- B. For anchorage to concrete framework, provide manufacturer's standard with dovetail anchor section formed from sheet metal and triangular-shaped wire tie section sized to extend within 1 inch of masonry face.
- C. For anchorage to steel framework provide manufacturer's standard anchors with crimped 1/4-inch-diameter wire anchor section for welding to steel and triangular-shaped wire tie section sized to extend within 1 inch of masonry face and as follows:
  - 1. Wire Diameter: 0.25 inch.

#### 2.10 MISCELLANEOUS ANCHORS

- A. Unit Type Masonry Inserts in Concrete: Cast iron or malleable iron inserts of type and size indicated.
- B. Dovetail Slots: Furnish dovetail slots, with filler strips, of slot size indicated, fabricated from 0.0336-inch (22-gage) sheet metal.
- C. Anchor Bolts: Steel bolts complying with A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
  - 1. Headed bolts.

#### 2.11 POST-INSTALLED ANCHORS

- A. Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing laboratory.
  - 1. Type: Expansion anchors.
  - 2. Corrosion Protection: Carbon steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).
  - 3. For Cast-In-Place and Post-Installed Anchors in Concrete: Capability to sustain, without failure, a load equal to 4 times loads imposed by masonry.
  - 4. For Post-Installed Anchors in Grouted Concrete Masonry Units: Capability to sustain, without failure, a load equal to 6 times loads imposed by masonry.

#### 2.12 METAL FLASHING

- A. Provide stainless steel flashing conforming to requirements specified in Section 076200, "Sheet Metal Work."

#### 2.13 MISCELLANEOUS MASONRY ACCESSORIES

- A. Nonmetallic Expansion Joint Strips: Premolded filler strips complying with ASTM D 1056, Type 2 (closed cell), Class A (cellular rubber and rubber-like materials with specific resistance to petroleum base oils), Grade 1 (compression-deflection range of 2-5 psi), compressible up to 35 percent, of width and thickness indicated, formulated from the following material:
  - 1. Neoprene.
  - 2. Urethane.

### 3. Polyvinyl chloride.

- B. **Preformed Control Joint Gaskets:** Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
  - 1. **Styrene-Butadiene Rubber Compound:** ASTM D 2000, Designation 2AA-805.
- C. **Bond Breaker Strips:** Asphalt-saturated organic roofing felt complying with ASTM D 226, Type 1 (No. 15 asphalt felt).
- D. **Weep Holes:** Provide clear plastic weep holes 3/8" wide and 1-1/2" high by four (4) inches long with insect screen equal to No. 342S made by Hohmann & Barnard or approved equal manufacturer listed above.
- E. **Cavity Drainage Material:** Provide 10" HDPE open mesh mortar net of full width of masonry cavity shown at all horizontal thru wall flashing and shelf angle on drawings manufactured by Hohmann & Barnard, Mortar Net or approved equal.
- F. **EPDM Closure Strips:** Provide product made from ethylene-propylene-diene terpolymer, complying with ASTM D 4637, 0.040-inch thick.

#### 2.14 MASONRY CLEANERS

- A. **Clean masonry and stone surfaces using high pressure (1500 psi) water.** Should contaminants remain on walls provide acidic cleaner as noted below.
- B. **Acidic Cleaner:** Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry units being cleaned.
  - 1. For masonry not subject to metallic oxidation stains, use formulation consisting of a concentrated blend of surface-acting acids, chelating, and wetting agents.
  - 2. For dark colored masonry not subject to metallic oxidation stains, use formulation consisting of a liquid blend of surface-acting acids and special inhibitors.
  - 3. For masonry subject to metallic oxidation stains, use formulation consisting of a liquid blend of organic and inorganic acids and special inhibitors.
  - 4. **Products:** Subject to compliance with requirements, provide the following:
    - a. "Sure Klean No. 600 Detergent," ProSoCo, Inc.
    - b. "Sure Klean No. 101 Lime Solvent," ProSoCo, Inc.
    - c. "Sure Klean Vana Trol," ProSoCo, Inc.
  - 5. Completely remove all traces of acid cleaner after cleaning is complete and prior to application of water repellent.
  - 6. Test solutions prior to start of cleaning at concealed area as approved by Commissioner.

## 2.15 MASONRY SEALERS (PT-5)

- A. "Sure Klean Weather Seal Siloxane WB" concentrated water repellent as manufactured by ProSoCo, or equivalent product of Thoro, Trojan, or approved equal; clear, solvent-free silicone/siloxane blend formulated to weatherproof masonry units without altering their natural appearance, and providing UV stability. Apply with low-pressure spray, brush or roller.
1. Masonry sealer must be chemically resistant to the following cleaning products:
    - a. "RX 101 All-Purpose Cleaner with Airicide" by Airex Laboratories.
    - b. "Trifectant" by Vétoquinol USA.

## 2.16 MORTAR AND GROUT MIXES

- A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, antifreeze compounds, or other admixtures, unless otherwise indicated below.
1. W. R. Grace "Dry Block" admixture shall be included in the mortar mix.
  2. Do not use calcium chloride in mortar or grout.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, for job-mixed mortar and ASTM C 1142 for ready-mixed mortar, of types indicated below:
1. Limit cementitious materials in mortar to Portland cement-lime.
  2. For masonry below grade and in contact with earth, and where indicated, use type indicated below:
    - a. Type S.
  3. For reinforced masonry, load bearing masonry, and where indicated, use type indicated below:
    - a. Type S.
  4. For exterior, above-grade non-load bearing walls and parapet walls; for interior non-load bearing partitions, and for other applications where another type is not indicated, use type indicated below:
    - a. Type N.
- C. Colored Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required.
- D. Colored Aggregate Mortar: Produce mortar of color required by use of colored aggregates in combination with selected cementitious materials.
1. Mix to match sample approved by the Commissioner.
- E. Grout for Unit Masonry: Comply with ASTM C 476 and referenced unit masonry standard.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions, with Contractor present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.
- B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.
- C. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. Comply with referenced unit masonry standards and other requirements indicated applicable to each type of installation included in Project.
- B. Thickness: Build cavity and composite walls and other 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.
- C. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of the Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.
- D. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.
- E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.
- F. Built-In Work
  - 1. As the work progresses, build in items specified under this and other Sections of these specifications. Fill in solidly with masonry around built-in items.
  - 2. Mortar in door frames, access doors, louvers and other metal items embedded or built into masonry work solidly with mortar as the masonry units are laid up.
  - 3. Grout under lintels, bearing plates, and steel bearing on masonry with solid bed grout.
  - 4. Sleeves, pipes, ducts and all other items which pass through masonry walls shall be caulked with interior grade sealant meeting requirements of Section 079200, so as to be air tight and prevent air leakage. Refer to Section 078413 for packing of voids in rated masonry walls.
  - 5. Fill vertical cells of masonry units solid with grout which have anchoring, reinforcing rods, supporting or hanging devices embedded in the cell including stone anchors and window or curtain wall anchors.

6. Fill vertical cells of masonry units solid with mortar on each side of door frames to sixteen (16) inches beyond.
7. Unless otherwise noted, fill vertical cells of masonry units solid with grout which are below steel bearing plates, steel beams, and ends of lintels, to eight (8) inches beyond bearing and from floor to bearing.
8. Place wire mesh in horizontal joint below masonry unit cells to be filled with mortar, to prevent mortar from dropping into unfilled cells below.
9. Masonry indicated as being reinforced shall have all voids filled solid with grout. Grout shall be consolidated in place by vibration or other methods which insure complete filling of cells. When the least clear dimension of the grouted cell is less than two (2) inches, the maximum height of grout pour shall not exceed twelve (12) inches. When the least clear dimension is two (2) inches or more, maximum height of grout pour shall not exceed forty-eight (48) inches. When grouting is stopped for one (1) hour or longer, the grout pour shall be stopped 1-1/2" below the top of a masonry unit. Vertical bar reinforcing shall be accurately placed and held in position while being grouted, and shall be in place before grouting starts. All such reinforcing shall have a minimum clear cover of 5/8". Lap all bars a minimum of forty (40) bar diameters and provide steel spacer ties (not to exceed 192 bar diameter) to secure and position all vertical steel and prevent displacement during grouting. Provide continuous horizontal reinforcement embedded in mortar joints every second course.

#### G. Cutting and Patching

1. All exposed masonry which requires cutting or fitting shall be cut accurately to size with motorized carborundum or diamond saw, producing cut edges.
2. Do not saw cut any masonry openings in face brick construction without Commissioner's approval and after a procedure has been reviewed and approved.
3. Holes made in exposed masonry units for attachment of handrail brackets and similar items shall be neatly drilled to proper size.
4. All masonry which requires patching in exposed work, if approved by Commissioner, shall be patched neatly with mortar to match appearance of masonry as closely as possible and to the Commissioner's satisfaction. Rake back joints and use pointing mortar to match as required.

### 3.3 CONSTRUCTION TOLERANCES

- A. Comply with construction tolerances specified herein and referenced standards.

### 3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
- B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.

- C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
  - 1. One-half running bond with vertical joint in each course centered on units in courses above and below.
  - 2. As indicated on drawings.
- D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- E. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.
- F. Built-In Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
  - 1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
  - 2. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
  - 3. Fill cores in hollow concrete masonry units with grout 3 courses (24 inches) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

### 3.5 CAVITY WALLS

- A. All exterior masonry walls, unless otherwise indicated, shall be cavity walls of thickness indicated.
- B. Cavity walls shall be securely tied together by horizontal joint reinforcement and ties anchored to reinforcement, as herein specified, spaced every other block course.
  - 1. Where cavity back-up is concrete use ties specified herein spaced sixteen (16) inches o.c. both directions.
- C. Cavity between facing and backing wall shall be kept clean and clear of all mortar droppings, and no mortar ledges shall project into the cavity. Temporary wood strips, cut to width of cavity and fitted with lift-up wires, shall be laid on the joint reinforcement and carefully lifted out before placement of the next layer of reinforcement. Any projecting mortar shall be spread over the back of the outer wythe immediately following the setting of the masonry unit.
  - 1. Cavity drainage material shall be installed at the bottom of each cavity over the flashing to protect weep holes.
- D. At cavity and solid walls adjacent to window openings fill block solid with mortar where window anchors are to be located. Coordinate with window subcontractor.
- E. Concrete block back-up at cavity wall construction shall be anchored to slab as indicated in structural drawings.

- F. Anchor CMU back-up with anchors as specified herein.
- G. Refer to Section 072100, "Thermal Insulation," for material and installation of cavity wall insulation and drainage board.

### 3.6 INTERIOR BLOCK PARTITIONS

- A. Build to full height unless otherwise shown on drawings. At non-rated partitions fill void between CMU and structural deck with continuous neoprene filler conforming to the requirements of Section 079000. At fire rated partitions, fill void with fire stop material meeting the requirements of Section 078413. Fasten to structure at top of partition using steel angles as specified herein.
- B. Provide continuous horizontal joint reinforcing every other block course, except as otherwise noted. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8". Lap reinforcement a minimum of six (6) inches at ends of units.
- C. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.
- D. Corners
  - 1. First course above floor to be square-edged corner units to allow for proper base installation.
  - 2. Provide interlocking masonry unit bond in each course at corners.
  - 3. Provide continuity at corners with prefabricated "L" reinforcement units, in addition to masonry bonding.
- E. Intersecting and Abutting Walls
  - 1. Unless vertical control joints are shown as part of structural frame, provide interlocking masonry bond. Provide starters and special shapes as shown on the drawings to bond these walls.
  - 2. In addition to masonry bonding, provide horizontal reinforcement using prefabricated "T" units at interior partitions.

### 3.7 MORTAR BEDDING AND JOINTING

- A. Lay hollow concrete masonry units as follows:
  - 1. With full mortar coverage on horizontal and vertical face shells.
  - 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
  - 3. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.
- B. Cut joints flush for masonry walls to be concealed or to be covered by other materials, unless otherwise indicated.

### 3.8 HORIZONTAL JOINT REINFORCEMENT

- A. General: Provide continuous horizontal joint reinforcement in CMU every other block course unless otherwise indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls, 1/2" elsewhere. Lap reinforcing a minimum of 6".
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, off sets, column fireproofing, pipe enclosures, and other special conditions.

### 3.9 ANCHORING MASONRY TO STRUCTURAL MEMBERS

- A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
  - 1. Provide an open space not less than 1" in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
  - 2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
  - 3. Space anchors as indicated, but not more than 24" o.c. vertically and 36" o.c. horizontally.

### 3.10 MOVEMENT (CONTROL AND EXPANSION) JOINTS

- A. General: Install control and expansion joints in unit masonry where indicated. Build in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in plane restraint of wall or partition movement.
- B. Form control joints in concrete masonry as follows:
  - 1. Fit bond breaker strips into hollow contour in ends of block units on one side of control joint. Fill the resultant core with grout and rake joints in exposed faces.
  - 2. Install preformed control joint gaskets designed to fit standard sash block.
  - 3. Install special shapes designed for control joints. Install bond breaker strips at joint. Keep head joints free and clear of mortar or rake joint.
- C. Build in horizontal pressure relieving joints where indicated; construct joints by either leaving an air space or inserting non-metallic 50% compressible joint filler of width required to permit installation of sealant and backer rod specified in Division 7 Section "Joint Sealers".
  - 1. Locate horizontal pressure relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

### 3.11 LINTELS

- A. Install steel lintels where indicated.



- B. Provide masonry lintels where shown and wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide or formed in place masonry lintels. Cure precast lintels before handling and installation. Temporarily support formed in place lintels.

1. For hollow concrete masonry unit walls, use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout.

- C. Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

### 3.12 FLASHING/WEEP HOLES

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated.

- B. Prepare masonry surfaces so that they are smooth and free from projections that could puncture flashing. Place through wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive/sealant/tape as recommended by flashing manufacturer before covering with mortar.

- C. Install flashings as follows:

1. At lintels and shelf angles, extend flashing a minimum of 4" into masonry at each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4" in the cavity, and through the inner wythe to within 1/2" of the interior face of the wall in exposed masonry. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2", unless otherwise indicated.
2. At heads and sills, extend flashing as specified above unless otherwise indicated but turn up ends not less than 2" to form a pan.
3. Install flashing in masonry veneer walls as specified above but carry flashing up face of sheathing at least 8".
4. Install flashing in accordance with requirements stated in Article 3.8 herein for installation of vapor barrier.
5. Cut off flashing flush with face of wall after masonry wall construction is completed.

- D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashings and as follows:

1. Form weep holes with product specified in Part 2 of this Section.
2. Space weep holes 16" o.c.
3. In insulated cavities/air spaces cover cavity/air space side of open weep holes with copper or plastic insect screening before placing loose fill masonry insulation in cavity.

- E. Install reglets and nailers for flashing and other related construction where shown to be built into masonry.

### 3.13 INSTALLATION OF REINFORCED UNIT MASONRY ASSEMBLIES

- A. General: Install reinforced unit masonry to comply with requirements of referenced unit masonry standard.
- B. Temporary Formwork: Construct formwork and shores to support reinforced masonry elements during construction.
  - 1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
- C. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
- D. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

### 3.14 FIELD QUALITY CONTROL

- A. Testing Frequency: Tests and evaluations listed in this article will be performed by the Contractor's Independent Testing Agency during construction for each 5000 sq. ft. of wall area or portion thereof.
  - 1. Mortar properties will be tested per property specifications of ASTM C 270.
  - 2. Mortar composition and properties will be evaluated per ASTM C 780.
  - 3. Grout compressive strength will be sampled and tested per ASTM C 1019.
- B. Prism Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM E 447, Method B, and as follows:
  - 1. Prepare one set of prisms for testing at 7 days and one set for testing at 28 days.
- C. Results of test shall be submitted to the Commissioner in writing.
- D. Evaluation of Quality Control Tests: In absence of other indications of non-compliance with requirements, masonry will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.

### 3.15 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
  2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Commissioner's approval of sample cleaning before proceeding with cleaning of masonry.
  3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film or waterproof masking tape.
  4. If high pressure water cleaning is not adequate, clean brick by means of bucket and brush hand cleaning method described in BIA "Technical Note No. 20 Revised" using the following masonry cleaner:
    - a. Job mixed acidic solution.
  5. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 45 applicable to type of stain present on exposed surfaces.
  6. Completely remove all cleaning agents prior to application of clear water repellent.
- D. Protection: Provide final protection and maintain conditions, in a manner acceptable to installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.
- E. Sealer: Per Section 079000.

END OF SECTION

SECTION 05 12 00  
STRUCTURAL STEEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes but is not limited to the following as shown on the drawings and as specified herein:
1. Furnish and deliver for installation by others, anchor bolts, bearing plates and loose lintels with complete instructions and templates to facilitate installation.
  2. Furnish and erect all columns, bearing plates, beams, girders, bracing, hangers and all related connections (bolted and welded).
  3. Openings (unreinforced and reinforced) in structural steel to accommodate mechanical and electrical work.
  4. Shop painting and field touch-up painting.
  5. Erection bracing and supports, including steel wedges, shims or nuts required for leveling base plates.
  6. Lintels and angles attached to structural steel as shown on drawings.
  7. Unless specifically excluded, furnish and install all other items for structural steel work indicated on the drawings, specified, or obviously needed to make the work of this Section complete.
  8. Waste Management
- B. Related Requirements:
1. Division 01 – DDC General Conditions.
  2. Division 03 Section "Cast in Place Concrete"
  3. Division 04 Section "Masonry Assemblies"
  4. Division 05 Section "Steel Decking"
  5. Division 05 Section "Metal Fabrications."
  6. Division 06 Section "Rough Carpentry."
  7. Division 07 Section "Waterproofing."
  8. Division 07 Section "Joint Sealers."
- C. Related Work Specified Elsewhere
1. Installation of anchor bolts furnished under this section.
  2. Grout under base and bearing plates.
  3. Installation of loose lintels furnished under this section.
  4. Miscellaneous metal work
  5. Field painting of structural steel, except as specified herein.
  6. Fireproofing systems.

### 1.3 SUSTAINABLE DESIGN REQUIREMENTS

- A. The Contractor is to implement practices and procedures to meet the Project's Sustainable Design goals, which include achieving LEED Silver. The Contractor shall ensure that the requirements related to these goals, as defined in this Section and in Related Sections of the Contract Documents, are implemented. Substitutions, or other changes to the Work proposed by the Contractor or their Subcontractors, shall not be allowed if such changes compromise the Project's Sustainable Design goals.
- B. The Contractor is to efficiently use resources and energy while executing the Work of this Section. Resource efficient aspects to be considered in completing this Project include the use of techniques that minimize waste generation, reuse of construction materials on site where possible, and recycling of waste generated during the construction process.
- C. Performance Requirements: The following criteria are required for the products included in this section
  - 1. All steel shall contain a minimum of 50% (combined) pre-consumer/post-consumer recycled content.
  - 2. Adhesives, sealants, paints and coatings used for the work of this section shall meet the Volatile Organic Compound (VOC) limits specified in Section 018113 "Sustainable Design Requirements," and below where applicable.
  - 3. Require mills and fabricators have ISO14001 certification. Maximize the re-use of salvaged steel (as approved by the Commissioner) and, for work on existing buildings, alert the design team to any existing steel which could be re-used but has not been indicated on the drawings.
  - 4. Maximize the recycled content of all steel products.
  - 5. Design details penetrating the façade strictly in accordance with the architectural and structural directives.
  - 6. Where possible all connections should be made using bolted as opposed to welded details.
  - 7. Where welding is required use Submerged Arc Welding (SAW). The Gas Metal Arc Welding (GMAW) shall be used were SAW is not applicable (such as for angled connections and anything irregular or short). Field welding shall be allowed only in special circumstances; in such cases Flux Core Arc welding (FCAW) shall be specified with the use of portable fume exhaust system.
  - 8. Use surface preparation techniques that minimize the use of halogenated solvents and solvents classified as volatile organic compounds. Consider using 'weathering steel' (ASTM A 847) for exterior steel with the approval of the Commissioner and Commissioner.
  - 9. Use high strength HSS round tubes instead of A36 Steel pipes with approval of the Commissioner.

### 1.4 LEED SUBMITTALS

- A. Submit LEED Certification as follows:
  - 1. LEED Materials Certification Form: For all installed products and materials of this Section, complete the "Environmental Materials Reporting Form" (attached to end of Section 018113 "Sustainable Design Requirements"). Information to be

supplied for this Form shall include:

- a. Cost breakdowns for materials included in the Contractor or sub-contractor's Work. Material cost does not include costs associated with labor and equipment.
  - b. The percentages (by weight) of pre-consumer and/or post-consumer recycled content in the supplied product(s).
  - c. Indication of whether the raw materials have been extracted, harvested or recovered, as well as the final product has been manufactured (location of final assembly), within 500 miles of the project site.
- B. VOC Reporting Form: For all installed products and materials of this Section, complete the "VOC Reporting Form" (attached to end of Section 018113 "Sustainable Design Requirements"). Information to be supplied for this Form shall include:
1. Provide generic name by means of product type or application of all field-applied interior adhesives, sealants, paints, and coatings in this Section.
  2. Provide corresponding referenced standard limits.
  3. Provide full name of supplied product(s) and vendor or manufacturer for each product in this Section.
  4. For all field-applied interior adhesives, sealants, paints, and coatings in this Section, provide Volatile Organic Compound (VOC) content in grams/liter or lbs./gallon.
- C. Letters of Certification: Provided by the manufacturer on the manufacturer's letterhead, verifying the amount of recycled content.
- D. Product Cut Sheets: For all materials that meet the sustainable design performance criteria as per the LEED Performance Requirements of this section.
- E. Material Safety Data Sheets (MSDS): For all applicable products. Applicable products include, but are not limited to, adhesives, sealants, paints, and coatings applied to the interior of the building. MSDS shall indicate the Volatile Organic Compound (VOC) content of products submitted. If an MSDS does not indicate VOC content, then product data sheets, manufacturer's literature, or certification letter indicating a product's VOC content can be submitted with the MSDS.
- F. Assemble required LEED Submittal information into one (1) package for each Specification Section or sub-contractor. Incomplete or inaccurate LEED Submittals may be used as the basis for rejecting the submittal products or assemblies.

## 1.5 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.

## 1.6 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of all connections required by the drawings to be completed by structural steel fabricator (including comprehensive engineering analysis by a qualified professional engineer) to withstand loads indicated and comply with other information and restrictions indicated, unless noted otherwise.
1. Select and complete connections using schematic details indicated and AISC 360.
  2. Use design method indicated on structural drawings.
  3. Moment Connections: Fully restrained unless otherwise noted on drawings.
- B. Lateral Framing Resisting System: Type used is indicated on structural drawings.

## 1.7 SUBMITTALS

- A. Product Data: Submit data for each type of product indicated in the contract documents.
- B. Shop Drawings: Submit shop drawings in accordance with the specifications as follows:
1. Show clearly all work, including relationship of structural steel to the adjacent work of other trades and to significant lines of finishes of other trades.
  2. Do not fabricate or deliver work to the site before drawings reviewed by the Commissioner and Commissioner have been returned.
  3. Before preparing steel shop drawings, submit proposed submittal schedule for review by Commissioner and Commissioner.
  4. Before preparing steel shop drawings, submit for review a set of job standards showing all necessary joint details with full particulars of connection pieces, shop and field welds, and holes for erection bolts and permanent bolts. These shall include any moment and shear connections. Appropriate marks for designating all types and sizes of joint details shall be included. After approval of these job standards, the erection plans are to be submitted and shall be marked to indicate unmistakably the type and size of joint to be used for every beam connection. Do not order steel in advance of approval of the job standards and the erection plans with joint marks, except at own risk
  5. Submit calculations for design of connections on job standards and all other connections such as moment and brace frames. Calculations shall be signed and sealed by a Professional Engineer licensed in the State of New York.
  6. Prepare remainder of steel shop drawings after approval of job standards and erection plans. Drawings submitted prior to approval of job standards will be returned without review.
  7. Prepare shop drawings in conformance with the applicable procedures shown in "*Detailing for Steel Construction*," latest edition, published by AISC. Prepare shop drawings under the supervision of competent engineering personnel, licensed by the state in which the construction is to take place. During the preparation of shop drawings, and prior to submittal, coordinate and cross check all shop drawings, including those prepared by subcontractors, for compliance with the Contract Documents.

8. Indicate clearly the size and grade of steel for each component. Identify rolled shapes, tubes and plates by using the standard designations used in "Steel Construction Manual" Latest Edition, by AISC.
9. Indicate welds and nondestructive tests by using the symbols conforming to AWS A2.4 "Symbols for Welding and Nondestructive Testing." Where necessary for clarity, indicate welding procedure designations or other data in the tail of the welding symbol.
10. Show explicitly the type of connection used in each location, the grade, size, and number of bolts; the type, number, position, designation and orientation of each washer; and the size of each hole, whether slotted or round. Ensure that adequate wrench clearance for correct bolt tightening is provided and note special bolt tightening sequences where applicable and necessary.
11. Show all camber dimensions in the shop drawings. Where specific camber is not shown in the drawings, note on each affected shop drawing that such members are to be fabricated with the natural camber up.
12. Show holes required for securing work specified in other sections to structural steelwork, as well as all holes required for passage through structural steelwork of work of other trades. Provide field work drawings for all such holes not shown in shop or erection drawings. Addition of, or change in size or location of openings will not be permitted without prior approval.
13. Use bolted connections wherever possible; avoid field welding unless otherwise noted on drawings.
14. Make details in such a way as to avoid having steel, connections, bracing, bolts, etc., interfere with architectural details or in any way reduce the areas of shafts, openings, clearances, etc.
15. Detail and schedule cleaning and painting data and requirements, including specific indication of "no-paint" areas.
16. The use of the Commissioner's or Commissioner's electronic drawing files as a base for the erection shop drawings will be permitted at the request of the structural steel detailer upon completion and return of the waiver form. The use of the Commissioner's or Commissioner's electronic drawing files as a base for shop drawing details will be not be permitted. The structural steel detailer will be responsible for compatibility of the files with his hardware or software. The electronic files are not to be considered the contract documents, the design team makes no representation regarding the accuracy or completeness of the electronic files given to the structural steel detailer and their use will be at the structural steel detailer's sole risk and without liability to the design team. The structural steel detailer shall remove the project title box and all references to the structural drawings including drawing numbers and structural drawing sections and details. The structural steel detailer shall also remove all reference to work not included in the steel contract.
17. Show clearly the size and location of each member and the erection mark assigned to each member. Show each field connection with all data and details necessary for assembling the structure. Direct special attention to the possible need for special guying, bracing, or shoring to prevent deformation of existing or new structure due to stresses caused by erection procedures and equipment, by construction loadings, and by forces of natural phenomena.
18. Prepare, keep up-to-date, and submit a complete drawing index cross-referencing each assigned piece mark with the drawing number in which the piece is detailed. Detail drawings submitted without an up-to-date index and the applicable erection drawing(s) showing the location of each piece will be deemed an incomplete submission and will not be accepted as subject to any agreed shop drawing review schedule.



19. Prepare anchor bolt and base plate erection drawings containing complete location and placing details, including details of all templates. Provide anchor bolt erection drawings to the concrete trade in advance of applicable concrete work and in coordination with concrete construction sequence.
  20. Submit, in writing, any proposed deviations from the Contract Documents, prior to the submission of shop drawings showing the proposed deviation. Submit requests for deviations on the steelwork subcontractor's letterhead. Deviations not identified, or identified only in letters of transmittal or in shop drawings or both, without the required written request, may not be accepted, and shall be sufficient cause for the Commissioner to return each shop drawing containing such deviations without further action. Acceptance of shop drawings containing deviations not detected by the Commissioner during shop drawing review shall not relieve the steelwork subcontractor from responsibility to conform strictly to the Contract Documents.
  21. Prior to resubmission of shop drawings with additions or corrections, circle or bubble and identify all changes. Drawings submitted without each change being clearly identified are subject to return for resubmission.
  22. Prior to making shop drawings for any portion of the work involving alterations to an existing structure, make all necessary field observations, measurements and surveys of existing conditions. If probes are required to accomplish such measurements, give timely notice where probes will be required.
- C. Submit certified copies of each survey conducted by a surveyor licensed by the state in which the construction is to take place and employed by the structural steel subcontractor. Survey shall show elevations and locations of base plates and anchor bolts to receive structural steel, and final elevations and locations for major members. Indicate discrepancies between actual installation and Contract Documents.
- D. Reports:
1. Submit certified copies of mill test reports for all steel furnished. Perform mechanical and chemical tests for all material regardless of thickness or use.
  2. Submit certification of recycled steel content. Certification shall clearly indicate post-consumer AND post-industrial recycled steel content for the particular member or members used.
  3. Submit mill and fabricator certification of compliance with ISO14001.
  4. Submit anchor bolt checking certification as required.
  5. Submit qualification certificates of all welders who will perform work on the project.
  6. Submit survey of erected steelwork as required.
- E. Submit verification of bio-degradable or low VOC, and low Hazardous Air Pollutants (HAPS) cleaning solutions. Provide a cut sheet for all cleaning solutions used in the surface preparation of steel components. Highlight VOC limits and chemical component limits.
- 1.8 QUALITY ASSURANCE
- A. Except as modified by this specification, comply with the applicable provisions and recommendations of the following codes and standards:
1. New York City Building Code, Latest Edition

2. AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings".
3. AISC "Code of Standard Practice for Steel Buildings and Bridges" latest edition.
4. AISC "Seismic Provisions for Structural Steel Buildings", latest edition.
5. Industrial Fasteners Institute "Handbook of Bolt and Bolted Joints" latest edition.
6. RCSC "Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts."
7. ASTM A 6 "General requirements for rolled steel plates, shapes, sheet piling and bars for structural use".
8. AWS D1.1, "Structural Welding Code."
9. AWS A5.18 & A5.28, Structural Welding Code for GMAW
10. SSPC "Painting Manual, Volume 2, Systems and Specifications.", Latest edition.

B. Qualifications for welding work shall be as follows:

1. Qualify welding procedures and welding operators in accordance with the AWS "Standard Qualification Procedure."
  - a. Include amended requirements of the building code as noted above.
2. Submit certification that all welders to be employed in work are AWS qualified. If re-certification of welders is required, retesting will be responsibility of structural steel subcontractor.
  - a. Include licensing requirements as per the building code noted above and local jurisdiction.

## 1.9 TESTING AND INSPECTION

- A. Special Inspection as required by the applicable Building Code of all structural steelwork in the shop and field will be performed by an inspection agency retained by the City of New York. The inspection agency shall work under the direction of the Commissioner. Contractor shall provide the inspection agency with the following:
1. Schedule of all work in both shop and field with at least ten days' written notice before commencement of either activity.
  2. A complete set of approved shop and erection drawings.
  3. Cutting lists, order sheets, material bills, shipping bills and mill test reports.
  4. Information as to time and place of all rollings and shipment of material to shops.
  5. Representative sample pieces as requested by the testing agency.
  6. Full and ample means and assistance for testing all material.
  7. Proper facilities, including scaffolding, temporary work platforms, etc., for inspection of the work in the mills, shop and field.
- B. Each person installing connections shall be assigned an identifying symbol or mark and all shop and field connections shall be so identified so that the inspector can refer back to the person making the connection.
- C. When defects are revealed, additional inspection by whatever method is deemed necessary by the inspector, shall be performed to the extent necessary to assure that the full amount of defect has been located. No further work shall be done on the assembly or sub-assembly in question until all the necessary corrections have been made. Defects shall be repaired, using the same welding procedure that was used

initially in making the weld, unless otherwise approved by the Commissioner. Inspection of the repaired weld shall be by the same method that was used to reveal the defect. A second repair of a defective area shall not be made without approval of the Commissioner.

- D. Apparatus and procedure for measuring torque and tension in high strength bolts and for calibrating wrenches shall be furnished and maintained by steel contractor, and shall be approved by the inspection agency. Wrenches shall be calibrated each day at the beginning of the work, each time the bolt size or length of pressure hose is changed, and at such other times as the inspection agency may direct. Periodic checks of high strength steel bolt connections will be made in the field by the inspection agency. The steel contractor shall maintain at all times during erection a manual torque wrench, and shall provide a laborer and scaffolding as required for the testing of connections by the inspection agency, and shall at his own expense, furnish such facilities and provide such assistance as may be required for proper inspection.
- E. A distinguishing mark will be placed on all work that has been inspected and approved. Material or work that is not acceptable will be designated by words such as "REJECT" or "REPAIR" marked directly on the material or work.
- F. Inspection of Shop Painting:
  - 1. Visually evaluate surface preparation by comparison with pictorial standards in accordance with SSPC-Vis 1.
  - 2. Measure dry film thickness of each coat with a magnetic film thickness gauge in accordance with SSPC-PA 2.
  - 3. Visually inspect dried film for runs, sags, dry spray, overspray and missed areas.
  - 4. Repair defective or damaged areas in accordance with painting requirements specified. Architecturally exposed structural steel shall be free of runs and holidays. Make repairs to shop or field coat as directed.

#### 1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site at such intervals to ensure uninterrupted progress of work. Minimize the disturbances to site and soil conditions.
- B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete, in ample time not to delay work.
- C. Store materials to permit easy access for inspection and identification. Keep steel members in a safe, dry, off ground location, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration, discoloration or staining.
- D. Do not store materials on structure in a manner that might cause distortion or damage to members of supporting structures. Repair or replace damaged materials or structures as directed.

#### 1.11 PROJECT CONDITIONS

- A. The structural steel contractor shall coordinate the structural steel work with the work of

other Contracts. Verify all dimensions and details of this Contract and those of other Contracts that affect the work before proceeding. Any discrepancies shall be immediately reported to the Commissioner.

- B. Be fully responsible for the accurate installation of the work. Any discrepancy which arises from his failure to execute the work in conformity to the drawings and specifications shall be properly remedied at the contractor's own expense and in a manner acceptable to the Commissioner.
- C. Locate dimensionally on setting plans all anchor bolts, inserts, bearing and base plates, etc., and prepare and deliver all required templates and fully dimensioned setting plans in time for the proper execution of the work. Anchor bolts shall be set by another subcontractor. The structural steel contractor shall check all such settings for correctness after they have been cast in place, and before proceeding with erection work.
- D. Report to the Commissioner and certify compliance with the above checking requirements in writing and indicate any inaccuracies found in the location of anchor bolts or inserts, and corrections which must be made to their installation. Any inaccuracies not included in the report and found during or after steel erection shall be the responsibility of the structural steel contractor and the cost of corrective measures shall be borne by him.
- E. Use base lines, bench marks, or other standards for survey work that have been provided or verified by others. If permanent building bench marks have been established, these will be used for field checking.
- F. Coordinate with all other trades to insure that work of this section does not cause undue conflict. Insure that location of erection devices such as cranes, derricks, booms or hoists, does not cause over-stresses to steel frame to work previously placed by other trades or to existing structures. When required, retain the services of a licensed professional engineer to ascertain that erection devices do not create unsafe conditions or cause overstresses.
- G. Ensure full co-ordination with other related trades and professions.

#### 1.12 SUBSTITUTION

- A. Commissioner reserves the right to require substitute shapes of other sizes than those indicated on the drawings when it is apparent that the shapes specified cannot be furnished within the time required for the progress of construction. Make said substitutions without additional cost to the City of New York.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Steel shapes, including structural steel wide flange and structural tee rolled shapes, channels, angles, plates, pipe, and hollow structural sections: As noted on structural drawings.

- B. High Strength Bolts:
1. Slip-critical bolts as noted on structural drawings, with hardened washers
- C. Anchor Bolts: As noted on structural drawings
- D. Filler metal for welding electrodes. As noted on structural drawings.
- E. Structural steel primer paint: rust inhibitive primer conforms to the following criteria
1. Demonstrate a minimum of adhesion as classified by 4B of ASTM D 3359 method A
  2. Demonstrate a minimum opacity as determined by ASTM D 2805
  3. Demonstrate corrosion resistance per standards ASTM B 117 & ASTM D 5894
  4. "Slip Critical" compatible rating where applicable
  5. The product shall not contain any of the prohibited compounds as listed in Green Seal *Standard for Paintings and Coatings*, GS-11, latest edition and in Master Painters Institute (MPI) *Green Performance Standard*, GPS-1-08.
  6. The product shall meet the VOC limits as set forth in the MPI Green Performance Standard, GPS-1-08, with a maximum allowable VOC of 340 g/L for rust preventative coatings. Limits are expressed in THINNED state. Preference shall be given to products with the least crystalline silica content.
  7. The product shall meet all the requirements of MPI Standards: 23, 26, 76, 79, 95, 107, 135, 173, 275. Products not listed with MPI are acceptable if and only if they meet the same environmental criteria for the same product category.
    - a. Exterior exposed steel, normal conditions: Use alkyd or polyamide solvent based paints (MPI #'s 76, 79 & 101)
    - b. Interior exposed steel: Use water based paint (MPI # 107)
    - c. Special Applications, highly corrosive environments: Use zinc rich paints (MPI #'s 20 & 200)
- F. Structural steel field paint for exposed members: rust inhibitive primer conforms to the following criteria
1. Demonstrate a minimum of adhesion as classified by 4B of ASTM D 3359 method A
  2. Demonstrate a minimum opacity as determined by ASTM D 2805
  3. Demonstrate corrosion resistance per standards ASTM B 117 & ASTM D 5894
  4. "Slip Critical" compatible rating where applicable.
  5. The product shall not contain any of the prohibited compounds as listed in Green Seal *Standard for Paintings and Coatings*, GS-11, latest edition and in the Master Painters Institute *Green Performance Standard*, GPS-1-08.
  6. The product shall meet the VOC limits as set forth in the MPI Green Performance Standard, GPS-1-08, with a maximum allowable VOC of 400 g/L for rust preventative coatings. Limits are expressed in THINNED state. Preference shall be given to products with the least crystalline silica content.
  7. The product shall meet all the requirements of MPI Standards: 23, 26, 76, 79, 95, 107, 135, 173, 275. Products not listed with MPI are acceptable if and only if they meet the same environmental criteria for the same product category. Products not listed with MPI are acceptable if and only if they meet the same environmental criteria for the same product category.

- a. Exterior exposed steel, normal conditions: Use alkyd or polyamide solvent based paints (MPI #'s 23, 79)
- b. Interior exposed steel: Use water based paint (MPI # 107)

### PART 3 - EXECUTION

#### 3.1 FABRICATION

- A. All shop connections shall be high strength bolted unless specifically shown otherwise. Fabricate work in shop in as large assemblies as practicable. Use welded connections ONLY where shown on drawings. If a bolted connection is not possible obtain written approval from the Commissioner for the welded connection.
- B. Camber: As indicated on drawings.
- C. Mill column ends and bearing stiffeners to give full bearing over the cross section. Plane contact surfaces of bearing plates when required by the AISC Specifications. It is not necessary to plane bottom surfaces of plates on grout beds.
- D. Drill or punch holes at right angles to the surface of the metal, not more than 1/16" larger than the connector diameter. Do not make or enlarge holes by burning. Drill material having a thickness in excess of the connector diameter and material thicker than 7/8". Holes shall be clean-cut without torn or ragged edges. Remove outside burrs resulting from drilling operations.
- E. Provide holes in members to permit connection of the work of other trades. Use suitable templates for proper location of these holes. Steel requiring adjustment or accurate alignment shall be provided with slotted holes or full bearing shims as shown.
- F. Provide holes, slots and openings required by other trades together with necessary reinforcing required. Use suitable templates for proper location of these openings. All such openings shall be shown on the shop drawings. No change in size or location will be permitted without prior approval.
- G. Manual flame cutting shall be done only with a mechanically guided torch. An unguided torch may be used provided the cut is within 1/8" of the required line.

#### 3.2 SHOP CONNECTIONS

- A. Provide connections as shown on the drawing exactly as detailed. Where connections are not detailed, the minimum connections shall comply with appropriate tables headed, "Framed Beam Connections" shown in the AISC "Manual of Steel Construction" unless otherwise noted on the drawings. Use high strength bolts unless otherwise shown.
- B. Do not use welded connections unless shown on details. Filed welding is not allowed without written instruction from the Commissioner.
- C. Proportion and detail all connections on shop drawings to resist forces shown on design drawings. If no reactions are indicated on design drawings, design connections

for non-composite beams to resist the end reaction shown in the AISC tables for Uniform Load Constants for Beams. Connections for composite beams shall be proportioned to resist 150% of the above mentioned tabulated load.

D. Bolting

1. Bolts shall be of a length that will extend not less than 1/4" beyond the nuts. Enter bolts into holes without damaging the thread.
2. Use high-strength bolts in friction as shown. Make high-strength bolted joints without the use of erection bolts. Bolt heads and nuts shall rest squarely against the metal. Where structural members have sloping surface, bolted connections shall be provided with beveled washers to afford square seating or framing for bolt heads or nuts. Bring members tightly together with sufficient high-strength "fitting-up" bolts which shall be retightened as all the bolts are finally tightened. Manual torque wrenches will not be accepted for final tightening. Protect bolt heads from damage during placing. Final tightening of high-strength bolts shall be by properly calibrated power torque wrenches. Bolts that have been completely tightened shall be marked for identification.

E. Welding

1. The following environmentally preferable welding processes shall be used as described for the related application without exception:
  - a. Submerged Arc Welding (SAW): Plate girders, fillet and butt joints in pipes, cylinders, columns and beams, and welds where 'downhand' or horizontal positions are possible.
  - b. Gas Metal Arc Welding (GMAW) shall be used where SAW is not applicable (such as for angled connections and anything irregular or short).
  - c. Field welding shall be allowed only in special circumstances; in such cases Flux Core Arc welding (FCAW) shall be specified
2. Do not begin structural welding until joint elements are inspected for surface preparation, fit-up, and cleanliness of surface to be welded and are then bolted or tacked in intimate contact and adjusted to dimensions shown on drawings, or both, with allowance for any weld shrinkage that is expected. No members are to be spliced without prior approval by the Commissioner.
  - a. Containment surface preparation debris must meet SSPC-Guide 6 guidelines.
3. Pre-heat and interpass temperature shall be in accordance with Table 4.2 (including footnotes) of the AWS Code for Welding in Building Construction. The temperature shall be measured from the side opposite to that which the pre-heat is applied, where possible.
4. All groove welds shall be continuous and full penetration welds unless otherwise shown on the design drawings. Welds made without the aid of a back-up bar shall have their roots chipped, ground or roughened out to sound metal from the second side, before welding is done from the second side.
5. All welds shall be sound throughout. There shall be no crack in any weld or weld pass. Weld may be considered sound if it contains only slight porosity or fusion

defects which are well dispersed.

6. The heat, input, length of weld and sequence of weld shall be controlled to prevent distortions. The surfaces to be welded and the filler metals to be used shall be subject to inspection before any welding is performed.

### 3.3 SHOP PAINTING AND CLEANING

#### A. Finishing, coating, plating

1. Shop painting and factory finishing shall be preferred to field painting whenever possible. Where applicable, finishes and surface preparations based on a physical process such as abrasive blasting, grinding, buffing and polishing are preferred to coatings and solvent based cleaning. Where coatings are necessary powder-coated fabrication is preferred to painting and plating. Avoid plated metals especially those using cadmium and chromium as plate material or cyanide or copper/formaldehyde based electroless copper as the plating solution.

#### B. Remove all rust, scale, grease and other detrimental foreign matter in accordance with SSPC-SP 3, Power Tool Cleaning, unless conditions/opportunities listed below apply.

1. Use surface preparation classification recommended by paint manufacturer, SSPC or Master Painters Institute (MPI) for paint product used.
  - a. SSPC-Guide 6, Guide for Containing Debris Generated During Paint Removal Operations, must be followed for all applicable surface preparation techniques.

#### C. Immediately after surface preparation, apply structural steel primer paint where specified, in accordance with manufacturer's instructions and at a rate to provide dry film thickness of not less than 2.0 mils. Use painting methods which result in full coverage of joints, corners, edges and exposed surfaces. Use type of primer paint as specified in "Materials" article above. Apply two coats to surfaces that will be inaccessible after erection

#### D. Paint all structural steel in accordance with the foregoing specification, except as follows:

1. Steel which is to receive spray-on fireproofing.
2. Within 2" of field welds or welds made after paint is applied.
3. Within 3" of high strength friction bolts.
4. Machined surfaces and threaded parts required for adjustment of the structure. Protect these with suitable rust inhibiting coating which may be removed after final installation of the work so that proper finished coatings may be applied.

### 3.4 SOURCE QUALITY CONTROL

- A. Refer to testing and inspection requirements specified above.

### 3.5 EXAMINATION

- A. Verify field measurements prior to start of erection. Check the alignment and elevation of all column supports and location of all anchor bolts with transit and level instruments



before starting erection. Notify Commissioner of any errors. Obtain Commissioner's approval of methods proposed for correcting errors prior to proceeding with corrections and erection.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.6 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

### 3.7 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

- B. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

- C. Column billets and bearing plates shall be supported and aligned on steel wedges, shims, or leveling nuts. After the supported members have been plumbed and properly positioned by instrument and anchor nuts tightened, the entire bearing area under the plate shall be packed solidly with grout specified in another Section. Wedges and shims shall be set back a minimum of 3/4" from the edges of plates and shall be left in place. Leveling plates are not permitted.

- D. Plumbing, Leveling and Bracing

- 1. Structural steel shall be erected true and level, and temporary bracing shall be introduced wherever necessary to provide for all loads to which the structure may be subjected, including equipment and the operation thereof. Such bracing shall be left in place as long as may be required for safety. No welding shall be done or bolts drawn up tight until structural steel has been properly aligned. Obtain approval for guy locations to assure lack of interference with operations of other trades.

- E. Drifting

- 1. Light drifting necessary to draw holes together will be permitted, but drifting of unfair holes will not be permitted. Twist drills shall be used to enlarge holes as necessary to the next larger size; use next larger size bolts as required. Reaming that weakens the members, or make it impossible to fill the holes properly or to adjust accurately after reaming, will not be allowed.

### 3.8 FIELD CONNECTIONS

- A. In addition to the requirements for shop connections comply with the following:

1. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  2. Joint Type: As noted on structural drawings.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
  2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

### 3.9 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
1. Clean and prepare surfaces by SSPC-SP 3, Power Tool Cleaning.
- C. Touchup Painting: Cleaning and touchup painting are specified in Division 9.
- D. After erection, all damaged areas in shop coat, exposed surfaces of bolt heads, nuts and washers, and all field welds and unpainted areas adjacent to field welds and high strength bolts shall be painted with a "touch-up" application of same paint used in the shop coat and then painted with same paint used for shop coat tinted another color. Retouch in field, any scraped, abraded, and unpainted surfaces. Painting shall be as specified for shop coats.
- E. Structural steel which is to support mechanical equipment and will be left exposed to the weather in the finished project shall be field painted with one coat of anti-corrosive paint as described in Part 2 for Paint Materials.

### 3.10 WASTE MANAGEMENT

- A. Separate and recycle waste materials in accordance with the Section 017419 Construction Waste Management and to the maximum extent feasible.
- B. Separate for recycling and place in designated containers the following metal waste in accordance with the Waste Management Plans and local recycler standards: Steel, iron, galvanized steel, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass and bronze.
- C. Collect all metal cut-offs and scraps and recycle as above.
- D. Fold up metal banding, flatten and place in designated area.

- E. Close and seal tightly all partly used paint and finish containers and store protected in a well-ventilated, fire-safe area at moderate temperature.
- F. Designated un-used paint for:
  - 1. Immediate re-use
  - 2. Long term maintenance needs
  - 3. Recycling by an appropriate facility.
  - 4. Donation
- G. Place empty containers of solvent-based paints in areas designated for hazardous materials.
- H. Do not dispose of paints or solvents by pouring on the ground. Place amounts too small to re-use in designated containers for proper disposal
- I. Place materials defined as hazardous or toxic waste in designated containers.

END OF SECTION

## SECTION 05 31 00

## STEEL DECKING

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to the work of this Section.

## 1.2 SUMMARY

- A. Section includes but is not limited to the following as shown on the drawings and as specified herein:

- 1. Roof deck
- 2. All necessary deck supports and reinforcing other than principal framing members including diagonals at columns, angles, plates, and etc.
- 3. Waste Management.

- B. Related Requirements:

- 1. Structural steel
- 2. Shoring of metal deck where unsupported span exceeds the allowable
- 3. Ceiling systems
- 4. Mechanical and electrical where supported from deck
- 5. Fireproofing systems
- 6. Sheet metal work
- 7. Waste Management/Recycling Strategies

## 1.3 SUSTAINABLE DESIGN REQUIREMENTS

- A. The Contractor is to implement practices and procedures to meet the Project's Sustainable Design goals, which include achieving LEED Silver. The Contractor shall ensure that the requirements related to these goals, as defined in this Section and in Related Sections of the Contract Documents, are implemented. Substitutions, or other changes to the Work proposed by the Contractor or their Subcontractors, shall not be allowed if such changes compromise the Project's Sustainable Design goals.
- B. The Contractor is to efficiently use resources and energy while executing the Work of this Section. Resource efficient aspects to be considered in completing this Project include the use of techniques that minimize waste generation, reuse of construction materials on site where possible, and recycling of waste generated during the construction process.
- C. Performance Requirements: The following criteria are required for the products included in this section
  - 1. All steel decking, and other steel products including but not limited to studs, reinforcement bar, fasteners, and clips required by the work of this section shall contain a minimum of 50% (combined) pre-consumer/post-consumer recycled content.

2. Adhesives, sealants, paints and coatings used for the work of this section shall meet the Volatile Organic Compound (VOC) limits specified in Section 018113 "Sustainable Design Requirements," where applicable.
3. Where welding is required use Submerged Arc Welding (SAW). The Gas Metal Arc Welding (GMAW) shall be used where SAW is not applicable (such as for angled connections and anything irregular or short). Field welding shall be allowed only in special circumstances; in such cases Flux Core Arc welding (FCAW) shall be specified with the use of portable fume exhaust system.
4. Use surface preparation techniques that minimize the use of halogenated solvents and solvents classified as volatile organic compounds.

D. LEED Performance Requirements:

1. Certification of recycled content, sourcing of materials, and VOC content shall be in accordance with the LEED Submittals requirements of this section.

1.4 LEED SUBMITTALS

A. Submit LEED Certification items as follows:

1. LEED Materials Certification Form: For all installed products and materials of this Section, complete the "Environmental Materials Reporting Form" (attached to end of Section 018113 "Sustainable Design Requirements"). Information to be supplied for this Form shall include:
  - a. Cost breakdowns for materials included in the Contractor or sub-contractor's Work. Material cost does not include costs associated with labor and equipment.
  - b. The percentages (by weight) of pre-consumer and/or post-consumer recycled content in the supplied product(s).
  - c. Indication of whether the raw materials have been extracted, harvested or recovered, as well as the final product has been manufactured (location of final assembly), within 500 miles of the project site.

B. VOC Reporting Form: For all installed products and materials of this Section, complete the "VOC Reporting Form" (attached to end of Section 018113 "Sustainable Design Requirements"). Information to be supplied for this Form shall include:

1. Provide generic name by means of product type or application of all field-applied interior adhesives, sealants, paints, and coatings in this Section.
2. Provide corresponding referenced standard limits.
3. Provide full name of supplied product(s) and vendor or manufacturer for each product in this Section.
4. For all field-applied interior adhesives, sealants, paints, and coatings in this Section, provide Volatile Organic Compound (VOC) content in grams/liter or lbs./gallon.

C. Letters of Certification: Provided by the manufacturer on the manufacturer's letterhead, verifying the amount of recycled content.

D. Product Cut Sheets: For all materials that meet the sustainable design performance criteria as per the LEED Performance Requirements of this section.

E. Material Safety Data Sheets (MSDS): For all applicable products. Applicable products

include, but are not limited to, adhesives, sealants, paints, and coatings applied to the interior of the building. MSDS shall indicate the Volatile Organic Compound (VOC) content of products submitted. If an MSDS does not indicate VOC content, then product data sheets, manufacturer's literature, or certification letter indicating a product's VOC content can be submitted with the MSDS.

- F. Assemble required LEED Submittal information into one (1) package for each Specification Section or sub-contractor. Incomplete or inaccurate LEED Submittals may be used as the basis for rejecting the submittal products or assemblies.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. Metal deck unit sizes and gages are indicated on the drawings. Gages indicated on the drawings are a minimum. Thickness of deck may be required to be increased by deck manufacturer for loadings indicated on drawings.
- B. Unit shall span over three or more supports except where steel layout does not permit.
- C. Maximum allowable deflection under live load plus super imposed dead load shall not exceed (1/360) of the span or (1/4) inch whichever is less.
- D. Deck shall be sized as unshored. Shoring of deck is not permitted unless specifically shown in areas on the drawings.
- E. Use of piercing, non-piercing, and integral hanger tabs is not permitted at roof deck.
- F. Units included in a fire rated assembly must be classified in appropriate UL design.

#### 1.6 SUBMITTALS

- A. Product Data: Product data, including manufacturer's specifications, load tables, section properties and installation instructions for each type of decking and accessories.
- B. Shop Drawings: Shop drawings for all installations showing gauges, deck layout, type of deck, any shoring required, where located, welding details necessary for fabrication to fit in place, and all accessories. Do not use reproductions of the Design Drawings. In addition include the following:
  - 1. Ceiling tab, fillers, closures and similar items.
- C. Product Certificates: Certification of specification compliance for each item specified.
- D. Reports
  - 1. Submit certification of recycled steel content. Certification shall clearly indicate post-consumer AND post-industrial recycled steel content for the particular member or members used.
  - 2. Submit mill and fabricator certification if in compliance with ISO14001.
  - 3. Submit verification of finishing process:
    - a. Provide a cut sheet and a Material Safety Data Sheet (MSDS) for all shop and field paints used highlighting VOC limits and chemical and mineral component limits.

- b. For heavy metals in used plating processes: Provide a cut sheet and a Material Safety Data Sheet (MSDS) for each plating material and related compounds highlighting chemical component limits.
  - c. Certification of recycled zinc content for galvanized products: Provide cut sheets clearly indicating whether the galvanized products used meet the minimums for post-consumer OR post-industrial recycled contents. Or, if cut sheets are not available, obtain a written affidavit from the manufacturer stating the recycled content percentage and if the recycled content is post-consumer or post-industrial.
4. Submit verification of biodegradable or low VOC, and low Hazardous Air Pollutants (HAPS) cleaning solutions. Provide a cut sheet and a Material Safety Data Sheet (MSDS) for all cleaning solutions used in the surface preparation of steel components. Highlight VOC limits and chemical component limits.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
- 1. Power-actuated mechanical fasteners.
  - 2. Acoustical roof deck.
- F. Evaluation Reports: For steel deck.

#### 1.7 QUALITY ASSURANCE

- A. Except as modified by governing codes and by this specification, comply with the applicable provisions and recommendations of the following codes and standards:
- 1. New York City Building Code, Latest Edition
  - 2. American Iron and Steel Institute (AISI) "Specification for the Design of Cold-Formed Steel Structural Members".
  - 3. American Welding Society (AWS), D1.1 "Structural Welding Code" and D1.3 "Structural Welding Code-Sheet Steel".
  - 4. Steel Deck Institute (SDI) "Design Manual for Composite Decks, Form Decks, and Roof Decks".
- B. Fabricator Qualifications: The work under this section shall be performed by a fabricator and erector submitting conclusive evidence of having satisfactorily completed work of similar scope and of having the necessary skill, equipment, facilities and capacities to fabricate and perform the erection in accordance with the construction schedules and in full compliance with all requirements of the Contract Documents.

#### 1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site at such intervals to ensure uninterrupted progress of work. However, efforts should be made to minimize the disturbance to site and soil conditions for example, by not requiring excessive areas to be put aside for on-site storage.
- B. Store materials to permit easy access for inspection and identification. Keep all materials in a safe, dry, off ground location, using pallets, platforms, or other supports. Protect all materials from corrosion and deterioration, discoloration or staining. Make efforts to minimize any wastage and ensure that as much waste as possible is recycled.

- C. Do not store materials on structure in a manner that might cause distortion or damage to members of supporting structures. Repair or replace damaged materials or structures as directed.

#### 1.9 PROJECT CONDITIONS

- A. Examine all work prepared by others to receive work of this section and report any defects affecting installation to the contractor for correction. Commencement of work will be construed as complete acceptance of preparatory work by others.
- B. If the supporting beams are not properly aligned or sufficiently level to permit proper bearing of the steel decking units, the steel decking contractor shall bring the matter to the attention of the contractor for corrective action. The steel decking units are not to be placed until the necessary correlations are made.
- C. Installation of the deck and shear studs will be inspected by the Commissioner and/or Commissioner's agent.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

#### 2.2 MANUFACTURERS

- A. Supply manufactured deck units in accordance with the applicable requirements of the Steel Deck Institute's "Design Manual for Floor Decks and Roof Decks".
- B. Deck shall be manufactured by one of the following (or other equivalent as approved by the Commissioner and engineer of record):
  - 1. United Steel Deck (manufactured by Canam)
  - 2. Wheeling Corrugating Co.
  - 3. Vulcraft

#### 2.3 DECK MATERIALS

- A. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, with the minimum section properties indicated on the drawings. Contractor shall provide heavier gauge if minimum gauge indicated is not adequate to support total loads as shown on the drawings.
- B. Acoustical Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, with the minimum section properties indicated on the drawings. Contractor shall provide heavier gauge if minimum gauge indicated is not adequate to support total loads as shown on the drawings.



## 2.4 ACCESSORIES

- A. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- B. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- C. Anchor clips, vent clips, welding washers, flashing, saddle plates, sump pans, other accessories shall be those types, sizes, and configurations recommended by the decking manufacturer, and shall be of the same material and finish as the deck units. All accessories shall conform to ASTM A653/A63M.
- D. Cell closure flexible strips, and fillers shall be of material in compliance with applicable building code governing class of construction.
- E. Roof sump pans: Fabricate from a single piece of galvanized sheet steel of the same quality as the deck units; not less than nominal 0.0747" (14 gauge) thick before galvanizing; with bottoms level after erection and sloping sides to direct water flow to the drain, unless otherwise shown. Provide sump pans of adequate size to receive roof drains and with bearing flanges not less than 3" wide. Recess pans not less than 1-1/2" below the roof deck surface, unless otherwise shown or required by deck configuration. Weld to deck at maximum 12" o.c.
- F. Paint: Where indicated on drawings, must be compatible with galvanized surfaces such that minimal preparation is required.
  - 1. For decks exposed to exterior conditions or high humidity paint must
    - a. Demonstrate corrosion resistance per standards ASTM B 117 & ASTM D 5894
  - 2. For all decks paint must:
    - a. Demonstrate a minimum opacity as determined by ASTM D 2805
    - b. Demonstrate a minimum of adhesion as classified by 4B of ASTM D 3359 method A
  - 3. The product shall not contain any of the prohibited compounds as listed in Green Seal *Standard for Paintings and Coatings*, GS-11, latest edition and in Master Painters Institute (MPI) *Green Performance Standard*, GPS-1-08.
  - 4. The product shall meet the VOC limits as set forth in the MPI Green Performance Standard, GPS-1-08, with a maximum allowable VOC of 340 g/L for rust preventative coatings. Limits are expressed in THINNED state. Preference shall be given to products with the least crystalline silica content.

## 2.5 FABRICATION

- A. Fabricate deck units in accordance with the AISI's "Specification for the Design of Cold-Formed Steel Structural Members" and accepted shop drawings. Fabricate deck units to the sizes and configurations indicated and cut to lengths which will span not fewer than three supporting members; use only full length units at overhang where indi-

cated in a manner that laps fit tightly. Locate openings for penetrations where indicated and provide support framing and edge reinforcement for all openings.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSPECTION

- A. Inspection of the metal deck and shear stud installation will be performed by an inspection agency retained by the Commissioner at no expense to the contractor. The inspection agency shall work under the direction of the Commissioner. Contractor shall provide the inspection agency with the following:
  - 1. Schedule of all work in both shop and field with at least ten days written notice before commencement of either activity.
  - 2. A complete set of approved shop and erection drawings.

#### 3.3 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section. Erection shall closely follow the erection of structural steel.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members as per load schedule provided on contract documents.
- D. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work, per drawings and manufacturer's specifications.
- F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- G. Headed shear studs shall be installed by welding through metal deck onto beam below. Automatic welding machinery of approved design, amperage, duration of current, etc., shall be used. Studs shall be tested by testing laboratory in accordance with AWS Procedures for Bend Test; replace all studs which do not pass test.
- H. All welding shall be performed by competent experienced welding mechanics. All welds shall be given a protective coat of paint as specified in painting article of section 051200.

- I. All abraded or damaged protective surfaces of steel decking work shall be touched up with a protective coat of paint by this contractor as erected.

### 3.4 ROOF DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members per drawings.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports per drawings.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing per manufacturer's specification but not less than 1-1/2 inches, with end joints as follows:
  1. End Joints: Lapped 2 inches minimum or butted at Contractor's option.
- D. All unframed openings in roof deck shall be reinforced per the drawings.
- E. Roof sump pans: Fabricate from a single piece of galvanized sheet steel of the same quality as the deck units; not less than nominal 0.0747" (14 gauge) thick before galvanizing; with bottoms level after erection and sloping sides to direct water flow to the drain, unless otherwise shown. Provide sump pans of adequate size to receive roof drains and with bearing flanges not less than 3" wide. Recess pans not less than 1-1/2" below the roof deck surface, unless otherwise shown or required by deck configuration. Weld to deck at maximum 12" o.c.
- F. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld to substrate to provide a complete deck installation.
  1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

### 3.5 FIELD QUALITY CONTROL

- A. Special Inspection as required by the applicable Building Code of all metal decking will be performed by an inspection agency retained by the City of New York. The inspection agency shall work under the direction of the Commissioner. Contractor shall provide the inspection agency with the following:
  1. Schedule of all work in field with at least ten days' written notice before commencement of either activity.
  2. A complete set of approved shop and erection drawings.
  3. Order sheets, material bills, shipping bills and mill test reports.
  4. Representative sample pieces as requested by the testing agency.
  5. Full and ample means and assistance for testing all material.
  6. Proper facilities, including scaffolding, temporary work platforms, etc., for inspection of the work in the mills, shop and field.
- B. Each person installing connections shall be assigned an identifying symbol or mark and all shop and field connections shall be so identified so that the inspector can refer back to the person making the connection.

- C. A distinguishing mark will be placed on all work that has been inspected and approved. Material or work that is not acceptable will be designated by words such as "REJECT" or "REPAIR" marked directly on the material or work.
- D. Testing agency will report inspection results promptly and in writing to Contractor and Commissioner.
- E. Remove and replace work that does not comply with specified requirements.
- F. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

### 3.6 CLEANING UP

- A. Remove all equipment, unused materials and debris from the site immediately upon the completion of this work.

### 3.7 WASTE MANAGEMENT

- A. Separate and recycle waste materials in accordance with the Section 017419 Construction Waste Management and to the maximum extent feasible.
- B. Separate for recycling and place in designated containers the following metal waste in accordance with the Waste Management Plans and local recycler standards: Steel, iron, galvanized steel, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass and bronze.
- C. Collect all metal cut-offs and scraps and recycle as above.
- D. Fold up metal banding, flatten and place in designated area.
- E. Close and seal tightly all partly used paint and finish containers and store protected in a well-ventilated, fire-safe area at moderate temperature.
- F. Designated un-used paint for:
  - 1. Immediate re-use
  - 2. Long term maintenance needs
  - 3. Recycling by an appropriate facility.
  - 4. Donation
- G. Place empty containers of solvent-based paints in areas designated for hazardous materials.
- H. Do not dispose of paints or solvents by pouring on the ground. Place amounts too small to re-use in designated containers for proper disposal
- I. Place materials defined as hazardous or toxic waste in designated containers.

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SECTION 05 42 00

LIGHT GAUGE STRUCTURAL FRAMING

PART 1 - GENERAL

1.1 GENERAL

- A. Work of this section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General: Provide all materials, labor, equipment and services, and perform all operations in connection with the furnishing and installing of light gauge structural framing complete, in accordance with the drawings and specifications, and including, but not limited to the following:
  - 1. Structural steel stud and joist system for roofs.
  - 2. Structural steel stud system for all interior partitions.
  - 3. Structural steel stud framing system for interior drywall veneer at the inside of the exterior wall.
  - 4. All accessories including bracing, reinforcement, anchors, fasteners and similar items as required to complete the work of this section.

1.2 RELATED WORK OF OTHER SECTIONS

- A. Division 01: DDC General Conditions.
- B. Concrete, Section 03 31 00
- C. Structural Steel, Section 05 12 00
- D. Steel Decking, Section 05 31 00
- E. Metal Fabrications, Section 05 70 00
- F. Gypsum Board Assemblies, Section 09 26 00

1.3 QUALITY ASSURANCE

- A. Materials and work shall conform to the latest edition of reference specifications specified herein, all required fire ratings and to all applicable codes and requirements of local authorities having jurisdiction.
- B. Compute structural properties of studs in accordance with AISI "Specification for the Design of Cold-Framed Steel Structural Members."
- C. Work of this section shall conform to the following standard specifications by other agencies (except where otherwise specified in this section), which shall be obtained and kept at the site.
  - 1. ANSI A42-4 - American Standard Specification for Interior Lathing and Furring.
  - 2. Metal Lath Association - Specifications for Metal Lathing and Furring.
- D. Welding shall conform to requirements for shielded metal arc welding of the Standard Code for Arc and Gas Welding of the American Welding Society.

#### 1.4 SUSTAINABLE DESIGN REQUIREMENTS

- A. The Contractor is to implement practices and procedures to meet the Project's Sustainable Design goals, which include achieving LEED Silver. The Contractor shall ensure that the requirements related to these goals, as defined in this Section and in Related Sections of the Contract Documents, are implemented. Substitutions, or other changes to the Work proposed by the Contractor or their Subcontractors, shall not be allowed if such changes compromise the Project's Sustainable Design goals.
- B. The Contractor is to efficiently use resources and energy while executing the Work of this Section. Resource efficient aspects to be considered in completing this Project include the use of techniques that minimize waste generation, reuse of construction materials on site where possible, and recycling of waste generated during the construction process.
- C. Performance Requirements: The following criteria are required for the products included in this section
1. All steel decking, and other steel products including but not limited to studs, reinforcement bar, fasteners, and clips required by the work of this section shall contain a minimum of 50% (combined) pre-consumer/post-consumer recycled content.
  2. Adhesives, sealants, paints and coatings used for the work of this section shall meet the Volatile Organic Compound (VOC) limits specified in Section 018113 "Sustainable Design Requirements," where applicable.
  3. Where welding is required use Submerged Arc Welding (SAW). The Gas Metal Arc Welding (GMAW) shall be used were SAW is not applicable (such as for angled connections and anything irregular or short). Field welding shall be allowed only in special circumstances; in such cases Flux Core Arc welding (FCAW) shall be specified with the use of portable fume exhaust system.
  4. Use surface preparation techniques that minimize the use of halogenated solvents and solvents classified as volatile organic compounds.
- D. LEED Performance Requirements:
1. Certification of recycled content, sourcing of materials, and VOC content shall be in accordance with the LEED Submittals requirements of this section.

#### 1.5 LEED SUBMITTALS

- A. Submit LEED Certification items as follows:
1. LEED Materials Certification Form: For all installed products and materials of this Section, complete the "Environmental Materials Reporting Form" (attached to end of Section 018113 "Sustainable Design Requirements"). Information to be supplied for this Form shall include:
    - a. Cost breakdowns for materials included in the Contractor or sub-contractor's Work. Material cost does not include costs associated with labor and equipment.
    - b. The percentages (by weight) of pre-consumer and/or post-consumer recycled content in the supplied product(s).
    - c. Indication of whether the raw materials have been extracted, harvested or recovered, as well as the final product has been manufactured (location of final assembly), within 500 miles of the project site.

- B. VOC Reporting Form: For all installed products and materials of this Section, complete the "VOC Reporting Form" (attached to end of Section 018113 "Sustainable Design Requirements"). Information to be supplied for this Form shall include:
1. Provide generic name by means of product type or application of all field-applied interior adhesives, sealants, paints, and coatings in this Section.
  2. Provide corresponding referenced standard limits.
  3. Provide full name of supplied product(s) and vendor or manufacturer for each product in this Section.
  4. For all field-applied interior adhesives, sealants, paints, and coatings in this Section, provide Volatile Organic Compound (VOC) content in grams/liter or lbs./gallon.
- C. Letters of Certification: Provided by the manufacturer on the manufacturer's letterhead, verifying the amount of recycled content.
- D. Product Cut Sheets: For all materials that meet the sustainable design performance criteria as per the LEED Performance Requirements of this section.
- E. Material Safety Data Sheets (MSDS): For all applicable products. Applicable products include, but are not limited to, adhesives, sealants, paints, and coatings applied to the interior of the building. MSDS shall indicate the Volatile Organic Compound (VOC) content of products submitted. If an MSDS does not indicate VOC content, then product data sheets, manufacturer's literature, or certification letter indicating a product's VOC content can be submitted with the MSDS.
- F. Assemble required LEED Submittal information into one (1) package for each Specification Section or sub-contractor. Incomplete or inaccurate LEED Submittals may be used as the basis for rejecting the submittal products or assemblies.

## 1.6 SUBMITTALS

- A. Samples: Samples of materials specified herein shall be submitted for approval prior to materials being delivered. Samples shall include the following:
1. 6" long each width and gauge
  2. Anchors
  3. Fasteners
  4. Bracing, channels and reinforcement, 6" long each type.
- B. Certificates: Certificates attesting to compliance with these specifications shall be submitted to the Commissioner for approval. Obtain approval prior to shipment of materials.
- C. Product Data: Copies of manufacturer's latest published literature for materials specified herein shall be submitted for approval prior to delivery of materials
- D. Shop Drawings: Shop drawings for the work of this section shall be submitted to the Commissioner for approval prior to the fabrication of materials.
1. Shop drawings shall show location of work in the project, elevations, profiles and sections. Indicate materials, sizes, shapes, thicknesses; sizes and location of bracing, reinforcement, anchors, fasteners; provisions for thermal movement; joints and connections to other work; locations of all items required by work of other trade.
  2. Submit with shop drawings all calculations in reference to structural properties of all members, assemblies and connection prior to fabrication of any parts of the work



and provide all additional structural members or increase gauge and weight of metals required for the proper erection and structural stability of the work. Calculations shall be prepared and certified by Professional Engineer licensed in the State of New York.

3. Shop drawings shall be in addition to the manufacturer's standard printed literature specified herein under Product Data.

#### 1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials specified herein, in manufacturer's unopened containers or bundles, with manufacturer's name, point of origin, brand, type and grade labeled or tagged on materials with each delivery.
- B. Store off the ground, in a dry, protected ventilated space. Protect all materials from rust, damage, detrimental conditions.

#### 1.8 EXAMINATION OF THE SITE

- A. Contractor shall examine the premises and thoroughly familiarize himself with all existing conditions, and conditions, which may arise that, would affect his contract. Failure to do so will not relieve the Contractor of his responsibility to complete his work at no additional cost to the City of New York. Contractor shall notify the Commissioner immediately in writing if he discovers any discrepancies between the drawings and existing conditions.

#### 1.9 EXISTING CONDITIONS

- A. Before submitting his proposal, each bidder shall examine all drawings relating to his work and visit the site verifying all existing conditions and become fully informed as to the extent and character of the work required and its relations to other work in the building. No consideration will be granted for alleged misunderstanding of material to be furnished or work to be done, it being understood that the tender of a proposal carries with it the agreement to all items and conditions referred to herein or indicated on the accompanying drawings. Special attention shall be made of the type and extent of removals, relocations, overtime needed for interruption of building services for disconnecting of existing and/or installation of new services, maintenance of continuity of services, etc.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Materials specified herein shall be as manufactured by Alabama Metal Industries, Chamberlain Manufacturing Corp., U.S. Gypsum, Marino Industries, U.S. Steel Corp., Wheeling Corrugating Co., or approved equal.
- B. Materials shall be furnished by one manufacturer throughout the project for work of this section.

#### 2.2 MATERIALS

- A. System: With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, stiffeners,

braces, fasteners, and accessories as recommended by manufacturer for the applications indicated, as needed to provide a complete metal framing system.

- B. Studs and joists shall conform to the following:
1. For 16 gauge and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield of 40,000 psi; ASTM A446, A570 or A611;
  2. For 18 gauge and lighter units, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi; ASTM A446, A570 or A611.
  3. Joists shall be "Joistrite" type with open webs.
- C. Galvanizing
1. Galvanized metal framing components shall comply with ASTM A525 for a minimum G60 coating.
  2. Hot Dip Galvanizing: Where specified or required, shall conform to ASTM A123. Galvanized coating shall successfully withstand the "Preece Test" referred to in the standard.
- D. Fastening Devices
1. Concrete Anchors shall conform to Federal Specifications FF-S-325, and shall be die cast zinc alloy, "Split Shield and Wedge" type machine bolt expansion shields of rated holding power four times required working load.
  2. Masonry Anchors shall be zinc plated steel "Gravity Action" toggle bolts conforming to Federal Specifications FF-B-588, or machine bolt expansion shields, UL approved for use in hollow masonry; of rated holding power four times required working load.
  3. Machine Screws shall conform to Federal Specification FF-S-92.
  4. Nuts and Bolts shall conform to ASTM A307.
  5. All fastening devices shall be galvanized as specified herein and shall be of sizes required to support the work of this section.

## 2.3 FABRICATION

- A. Design Criteria
1. All structural members shall be engineered in accordance with American Iron and Steel Institute (AISI) "Specification for the Design of Cold Formed Steel Structural Members," current edition.
  2. Floor framing shall be sized and spaced to support a superimposed live plus a superimposed dead load as indicated on the Contract Documents. Deflection limitation for the total dead and live load shall be  $L/360$ .
  3. Interior partitions shall be sized for a lateral wind load of 5 psf and applied axial loads. Lateral deflection shall not exceed  $L/360$ .
- B. Minimum section framing members shall be of a size, type and spacing as shown in plan but not less than the following:
1. Floor Joists
    - a. 6" minimum depth not less than 18 gauge and a spacing not to exceed 16" on center.
- C. Framing components may be prefabricated into panels prior to erection. Fabricate panels plumb, square, true to line and braced against racking with joints welded. Perform lifting of prefabricated panels in a manner to prevent damage or distortion in any members in the assembly.

- D. Fastenings: Attach similar components by welding. Attach dissimilar components by welding, bolting, or screw fasteners, as standard with the manufacturer. Wire typing of components shall not be permitted. Touch up all welds with Zinc rich paint.
- E. Openings
  - 1. All floor joists shall have open webs (Joistrite by Marino or equal)
  - 2. Bridging: Provide channel section bridging 18 gauge minimum 2 inches less in depth than depth of spanning joists. Provide two screws in each leg of connecting angles. Provide number of lines of bridging (uniformly spaced) as indicated below for spans of joists.
    - a. Joist Span Number of Bridging Lines:
      - 1) 0 to 8'-0" No bridging
      - 2) 8'-0" to 14'-0" One row at midspan
      - 3) 14'-0" and more Two rows at third points

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Make a thorough examination of all surfaces receiving the work of this section and before starting the installation, notify the Commissioner, in writing, of any defect which would affect the satisfactory completion of the work of this section.

#### 3.2 PREPARATION

- A. Examine the contract drawings and specifications in order to insure the completeness of the work required under this section. Supplementary parts, necessary to complete all work, though not specifically indicated on drawings or specified herein, shall be provided.
- B. Verify all measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this section with the work of related trades (with particular attention given to the installation of items embedded in concrete and masonry) so as not to delay job progress.

#### 3.3 INSTALLATION / ERECTION – GENERAL

- A. All work of this section shall be fabricated and installed in a thorough and workmanlike manner by skilled workmen to the complete satisfaction of the Commissioner.
- B. All cutting, drilling, punching and tapping required for the installation and attachment of work of other trades to work of this section, except where specified otherwise.
- C. Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations, unless otherwise indicated.
- D. Unless otherwise indicated, all joints shall be as strong and rigid as adjoining sections. Welding shall be continuous along entire line of contact, except where spot welding is indicated or permitted. Where bolted or screwed, connections are indicated, such connections may be welded at the Contractor's option.

- E. Where welding is required, it shall conform to requirements for shielded metal arc welding of the Standard Code of Arc and Gas Welding of the American Welding Society.
- F. Except where otherwise indicated, all work shall be fastened to concrete with expansion bolts and to hollow block with toggle bolts. Fastening to wood plugs in concrete or masonry will not be permitted. Holes for plugs or bolts shall be drilled to the exact diameter of the plug or bolt, using a percussion drill for concrete and a rotary drill for masonry. Screws shall be threaded full length to the head of the screw.

#### 3.4 NON-BEARING WALL CONSTRUCTION

- A. Install continuous tracks sized to match studs. Align tracks accurately. Secure tracks as recommended by the stud manufacturer for the type of construction involved. Provide fasteners at corners and end of tracks. Provide complete, uniform and level bearing support for bottom runner track.
- B. Where stud system abuts structural column or wall, including masonry wall, anchor ends of stiffeners to supporting structure.
- C. To maintain studs plumb and true, provide supplementary framing, blocking, bracing, stiffeners, reinforcement and similar items as indicated or required to support the work of this section and other trades. Where type of supplementary support is not otherwise indicated, comply with the stud manufacturer's recommendations, Section 5-1 of the AISI Specification, and industry standards in each case, considering the weight or loading resulting from the item supported.
- D. Secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges.
- E. Frame wall openings larger than 2'-0" square with double stud at each jamb of frame except where more than two are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack stud same as full height studs of the wall. Secure stud system all around to wall opening frame in the manner indicated.
- F. Temporary bracing, where required, shall be provided until erection is complete.

#### 3.5 STEEL JOISTS

- A. Joists shall be located directly over bearing studs or a load distribution member shall be provided at the top of the bearing wall.
- B. Web stiffeners shall be provided at reaction points and/or at points concentrated loads where indicated on the plans.
- C. Joist bridging shall be provided where indicated on the plans or as referenced to Part II of this specification.
- D. Additional joists shall be provided under parallel partitions when the partition length exceeds one half (1/2) the joist span and around all floor and roof openings which interrupt one (1) or more spanning member(s) unless otherwise noted.

- E. End blocking shall be provided where joist ends are not otherwise restrained from rotation.

### 3.6 PAINTING

- A. Touch up all shop applied coatings damaged during handling and installation. Use compatible primers with surfaces to be touched up.

END OF SECTION

SECTION 05 50 00  
METAL FABRICATIONS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the miscellaneous metal work as indicated on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Rough hardware.
  - 2. Loose bearing and leveling plates.
  - 3. Loose steel lintels.
  - 4. Shelf and relieving angles.
  - 5. Steel shelf/coat rack.
  - 6. Stainless steel handrail.
  - 7. Steel roof guardrail and acoustic barrier assembly.
  - 8. Thresholds.
  - 9. Steel brackets for Multipurpose Room soffit.
  - 10. Steel channel framing system.
  - 11. Sleeves in concrete walls and slabs.
  - 12. Aluminum glazing shoes and channels.

13. Steel framing, bracing, supports, anchors, bolts, shims, fastenings, and all other supplementary parts indicated on drawings or as required to complete each item of work of this Section.
14. Prime painting, touch-up painting, galvanizing and separation of dissimilar metals for work of this Section.
15. Cutting, fitting, drilling and tapping work of this Section to accommodate work of other Sections and of concrete, masonry or other materials as required for attaching and installing work of this Section.

### 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Concrete – Section 03 30 00.
- C. Structural steel - Section 05 12 00.
- D. Access doors - Section 08 31 13.
- E. Painting - Section 09 90 00.

### 1.4 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.
- B. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.
- C. Reference Standards: The work is subject to requirements of applicable portions of the following standards:
  1. "Manual of Steel Construction," American Institute of Steel Construction.
  2. AWS D1-1 "Structural Welding Code," American Welding Society.
  3. SSPC SP-3 "Surface Preparation Specification No. 3, Power Tool Cleaning," Steel Structures Painting Council.
  4. SSPC PA-1 "Painting Application Specification," Steel Structures Painting Council.
  5. "Handbook on Bolt, Nut and Rivet Standards," Industrial Fasteners Institute.
- D. Steel Materials: For steel to be hot dip-galvanized, provide steel chemically suitable for metal coatings complying with the following requirements: carbon below 0.25 percent, silicon below 0.24 percent, phosphorous below 0.05 percent, and manganese below 1.35 percent. Notify galvanizer if steel does not comply with these requirements to determine suitability for processing.
- E. Engage the services of a galvanizer who has demonstrated a minimum of three years experience in the successful performance of the processes outlined in this specification in the facility where the work is to be done and who will apply the galvanizing and

coatings within the same facility as outlined herein. The Commissioner has the right to inspect and approve or reject the galvanizer/galvanizing facility.

- F. The galvanizer/galvanizing facility must have an ongoing Quality Control/Quality Assurance program which has been in effect for a minimum of three years and shall provide the Commissioner with process and final inspection documentation. The galvanizer/galvanizing facility must have an on-premise testing facility capable of measuring the chemical and metallurgical composition of the galvanizing bath and pickling tanks.

1. The galvanizer must be able to galvanize long sections.

- G. Inspection and testing of hot-dip galvanized coating shall be done under the guidelines provided in the American Hot-Dip Galvanizers Association (AGA) publication "Inspection of Products Hot-Dip Galvanized After Fabrication."

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).

4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. **Manufacturer's Literature:** Submit manufacturer's specifications, load tables, dimension diagrams, anchor details and installation instructions for products to be used in the fabrication of miscellaneous metal work, including paint products.
- C. **Samples:** Submit samples of all finish materials of this specification, 8" x 8" minimum.
- D. **Shop Drawings:** Shop drawings for the fabrication and erection of all assemblies of miscellaneous iron work which are not completely shown by manufacturer's data sheets. Include plans and elevations at not less than 1" to 1'-0" scale, and include details of sections and connections at not less than 3" to 1'-0" scale. Show anchorage and accessory items.
- E. **Structural Calculations:** Provide calculations by Structural Engineer licensed in the State of New York to demonstrate applicable Code compliance for loading conditions on the acoustic barrier assembly, for connections between panels, frame and roof structure.
- F. **Welding** shall be indicated on shop drawings using AWS symbols and showing length, size and spacing (if not continuous). Auxiliary views shall be shown to clarify all welding. Notes such as 1/4" weld, weld and tack weld are not acceptable.
- G. **Certification:** For items to be hot-dip galvanized, identify each item galvanized and to show compliance of application. The Certificate shall be signed by the galvanizer and shall contain a detailed description of the material processed and the ASTM standard used for the coating and, the weight of the coating. In addition, and as attachment to Certification, submit reports of testing and inspections indicating compliance with the provisions of this Section.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 0181313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

**PART 2 PRODUCTS****2.1 MATERIALS****A. Metals**

1. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
2. Steel Plates, Shapes and Bars: ASTM A 36.
3. Steel Bar Grating: ASTM A 1011/A or ASTM A 36.
4. Steel Tubing: Cold formed, ASTM A 500; or hot rolled, ASTM A 501.
5. Structural Steel Sheet: Hot rolled, ASTM A 570; or cold rolled, ASTM A 611, Class 1; of grade required for design loading.
6. Galvanized Structural Steel Sheet: ASTM A 924, of grade required for design loading. Coating designation G90.
7. Steel Pipe: ASTM A 53, type and grade as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (Schedule 40), unless otherwise indicated.
8. Gray Iron Castings: ASTM A 48, Class 30, unless another class is indicated or required by structural loads.
9. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.
10. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
11. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.
12. Stainless Steel: Type 316, ASTM A 666 and ASTM 4276.
  - a. Custom Perforated Stainless Steel: Perforated stainless steel sheet or plate of thickness, size, and pattern indicated. Form perforations by punching, cutting, or drilling to produce openings of sizes and shapes indicated. Roll, press, and grind perforated metal to flatten and to remove burrs and deformations.
13. Aluminum
  - a. Alloy and Temper: Provide alloy and temper as indicated or as otherwise recommended by the aluminum producer or finisher.
  - b. Aluminum Extrusions, Bars and Shapes: Alloy and temper recommended by aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T6.

- c. Aluminum Plate and Sheet: Alloy and temper recommended by aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 209, alloy 6061-T6.
  - d. Class I, Clear Anodic Finish: AA-M12C22A41 Medium satin directional textured mechanical finish; inhibited chemical cleaning; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker complying with AAMA 607.1.
  - e. Class II, Clear Anodic Finish: AA-M12C22A31 Medium satin directional textured mechanical finish; inhibited chemical cleaning; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker complying with AAMA 607.1. Interior use only.
- B. Grout: Non-shrink, non-metallic grout conforming to the requirements of Section 033000.
- C. Fasteners
- 1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
  - 2. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
  - 3. Anchor Bolts: ASTM F 1554, Grade 36.
  - 4. Lag Bolts: ASME B18.2.1.
  - 5. Machine Screws: ASME B18.6.3.
  - 6. Plain Washers: Round, carbon steel, ASME B18.22.1.
  - 7. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
  - 8. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
  - 9. Lock Washers: Helical spring type carbon steel, ASME B18.21.1.
- D. Shop Paint: Shop prime all non-galvanized miscellaneous metal items using "Series 88 Azeron Primer" by Tnemec, "Rust Guard" quick dry alkyd shop coat No. 41403 by ICI Devoe, or "Interlac 393" by International Protection Coatings, or approved equal.
- 1. If steel is to receive high performance coating as noted in Section 099000, shop prime using primer noted in Section 099000.
- E. Bituminous Paint: Cold applied asphalt emulsion complying with ASTM D 1187.
- F. Galvanizing Repair Coating: For touching up galvanized surfaces after erection, provide repair coating that is V.O.C. compliant, equal to "Silver Galv" made by Z.R.C. Worldwide or approved equal. Apply to a dry film thickness of 1.5 to 3.0 mils.

## 2.2 PRIME PAINTING

- A. Scope: All ferrous metal (except galvanized steel) shall be cleaned and shop painted with one coat of specified ferrous metal primer. No shop prime paint required on galvanized steel or aluminum work.

- B. Cleaning: Conform to Steel Structures Painting Council Surface Preparation Specification SP 3 (latest edition) "Power Tool Cleaning" for cleaning of ferrous metals which are to receive shop prime coat.
1. Steel to get high performance coating as noted in Section 099000 shall be cleaned as per SSPC SP.6 "Commercial Blast Cleaning."
- C. Application
1. Apply shop prime coat immediately after cleaning metal. Apply paint in dry weather or under cover. Metal surfaces shall be free from frost or moisture when painted. Paint all metal surfaces including edges, joints, holes, corners, etc.
  2. Paint surfaces which will be concealed after shop assembly prior to such assembly. Apply paint in accordance with approved paint manufacturer's printed instructions, and the use of any thinners, adulterants or admixtures shall be only as stated in said instructions.
  3. Paint shall uniformly and completely cover the metal surfaces, 2.0 mils minimum dry film thickness. No work shall be shipped until the shop prime coat thereon has dried.
- D. Touch-Up: In the shop, after assembly and in the field, after installation of work of this Section, touch-up damaged or abraded portions of shop prime paint with specified ferrous metal primer.
- E. Apply one shop coat to fabricated metal items, except apply two (2) coats of paint to surfaces inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.

### 2.3 GALVANIZING

- A. Scope: All ferrous metal exposed to the weather, and all ferrous metals indicated on drawings or in specifications to be galvanized, shall be cleaned and then hot-dipped galvanized after fabrication.
- B. Avoid fabrication techniques that could cause distortion or embrittlement of steel items to be hot-dip galvanized. Fabricator shall consult with hot-dip galvanizer regarding potential warpage problems or handling problems during the galvanizing process that may require adjustment of fabrication techniques or design before finalizing shop drawings and beginning of fabrication.
- C. Cleaning: Thoroughly clean metal surfaces of all mill scale, rust, dirt, grease, oil, moisture and other contaminants prior to galvanizing.
- D. Application: Hot-dip galvanizing shall be applied in accordance with:
1. ASTM A 143: Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel.
  2. ASTM A 123: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  3. ASTM A 153: Galvanized Coating on Iron and Steel Hardware - Table 1.
  4. ASTM A 385: Practice for Providing High Quality Zinc Coatings.

5. ASTM A 924: Galvanized Coating on Steel Sheets.
  6. Minimum weight of galvanized coating shall be two (2) oz. per square foot of surface.
- E. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
  - F. All galvanized materials must be inspected for compliance with these specifications and marked with a stamp indicating the name of the galvanizer, the weight of the coating, and the appropriate ASTM number.
  - G. To minimize surface imperfection (eg: flux inclusions), material to be galvanized shall be dipped into a solution of Zinc Ammonium Chloride (pre-flux) immediately prior to galvanizing. The type of galvanizing process utilizing a flux blanket overlaying the molten zinc will not be permitted.
  - H. After galvanizing all materials not exposed to view must be chromated by dipping material in a 0.2% chromic acid solution.
  - I. Galvanized surfaces, where exposed to view, must have a smooth, level surface finish. Where this does not occur, piece shall be rejected and replaced to the acceptance of the Commissioner.

#### 2.4 PROTECTIVE COATINGS

- A. Whenever dissimilar metals will be in contact, separate contact surfaces by coating each contact surface prior to assembly or installation with one coat of specified bituminous paint, which shall be in addition to the specified shop prime paint. Mask off those surfaces not required to receive protective coating.

#### 2.5 WORKMANSHIP

##### A. General

1. Miscellaneous metal work shall be fabricated by an experienced fabricator or manufacturer and installed by an experienced tradesman.
2. Materials, methods of fabrication, fitting, assembly, bracing, supporting, fastening, operating devices, and erection shall be in accordance with drawings and specifications, approved shop drawings, and best practices of the industry, using new and clean materials as specified, having structural properties sufficient to safely sustain or withstand stresses and strains to which materials and assembled work will be subjected.
3. All work shall be accurately and neatly fabricated, assembled and erected.

- B. Shop Assembly: Insofar as practicable, fitting and assembly of work shall be done in shop. Shop assemble work in largest practical sizes to minimize field work. It is the responsibility of the miscellaneous metal subcontractor to assure himself that the shop-fabricated miscellaneous metal items will properly fit the field condition. In the event that shop-fabricated miscellaneous metal items do not fit the field condition, the item shall be returned to the shop for correction.

- C. Cutting: Cut metal by sawing, shearing, or blanking. Flame cutting will be permitted only if cut edges are ground back to clean, smooth edges. Make cuts accurate, clean, sharp and free of burrs, without deforming adjacent surfaces or metals.
- D. Holes: Drill or cleanly punch holes; do not burn.
- E. Connections: Make connections with tight joints, capable of developing full strength of member, flush unless indicated otherwise, formed to exclude water where exposed to weather. Locate joints where least conspicuous. Unless indicated otherwise, weld or bolt shop connections; bolt or screw field connections. Provide expansion and contraction joints to allow for thermal movement of metal at locations and by methods approved by Commissioner.
  - 1. Welding
    - a. Shall be in accordance with "Standard Code for Welding in Building Construction" of the American Welding Society, and shall be done with electrodes and/or methods recommended by the manufacturer of the metals being welded.
    - b. Welds shall be continuous, except where spot welding is specifically permitted. Welds exposed to view shall be ground flush and dressed smooth with and to match finish of adjoining surfaces; undercut metal edges where welds are required to be flush.
    - c. All welds on or behind surfaces which will be exposed to view shall be done so as to prevent distortion of finished surface. Remove weld spatter and welding oxides from all welded surfaces.
  - 2. Bolts and Screws: Make threaded connections tight with threads entirely concealed. Use lock nuts. Bolts and screw heads exposed to view shall be flat and countersunk. Cut off projecting ends of exposed bolts and screws flush with nuts or adjacent metal.
- F. Operating Mechanism: Operating devices (i.e. pivots, hinges, etc.) mechanism and hardware used in connection with this work shall be fabricated, assembled, installed and adjusted after installation so that they will operate smoothly, freely, noiselessly and without excessive friction.
- G. Built-In Work: Furnish anchor bolts, inserts, plates and any other anchorage devices, and all other items specified under this Section of the Specifications to be built into concrete, masonry or work of other trades, with necessary templates and instructions, and in ample time to facilitate proper placing and installation.
- H. Supplementary Parts: Provide as necessary to complete each item of work, even though such supplementary parts are not shown or specified.
- I. Coordination: Accurately cut, fit, drill and tap work of this Section to accommodate and fit work of other trades. Furnish or obtain, as applicable, templates and drawings to or from applicable trades for proper coordination of this work.
- J. Exposed Work
  - 1. In addition to requirements specified herein and shown on drawings, all surfaces exposed to view shall be clean and free from dirt, stains, grease, scratches,

distortions, waves, dents, buckles, tool marks, burrs, and other defects which mar appearance of finished work.

2. Metal work exposed to view shall be straight and true to line or curve, smooth arrises and angles as sharp as practicable, miters formed in true alignment, profiles accurately intersecting, and with joints carefully matched to produce continuity of line and design.
  3. Exposed fastenings, where permitted, shall be of the same material, color and finish as the metal to which applied, unless otherwise indicated, and shall be of the smallest practicable size.
- K. Preparation for Hot-Dip Galvanizing: Fabricator shall correctly prepare assemblies for galvanizing in consultation with galvanizer and in accordance with applicable Reference Standards and applicable AGA publications for the "Design of Products to be Hot-Dip galvanized After Fabrication." Preparation shall include but not be limited to the following:
1. Remove welding flux.
  2. Drill appropriate vent holes and provide for drainage in inconspicuous locations of hollow sections and semi-enclosed elements. After galvanizing, plug vent holes with shaped lead and grind smooth.

## 2.6 MISCELLANEOUS METALS ITEMS

### A. Rough Hardware

1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and finish metal pieces panels (color anodized aluminum trim and panels), and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6 Sections.
2. Fabricate items to sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood connections; elsewhere, furnish steel washers.

### B. Loose Steel Lintels

1. Provide loose structural steel lintels for openings and recesses in masonry walls and partitions as shown. Weld adjoining members together to form a single unit where indicated. Provide not less than eight (8) inches bearing at each side of openings, unless otherwise indicated.
2. Loose lintels shall conform to the Schedule on the Structural Drawings.
3. At columns or vertical surfaces where lintels cannot bear on masonry, provide clip angles sized for structural capacity of lintel.

### C. Miscellaneous Light Steel Framing

1. Light steel framing, bracing, supports, framing, clip angles, shelf angles, plates, etc., shall be of such shapes and sizes as indicated on the drawings and details or as required to suit the condition and shall be provided with all necessary supports

and reinforcing such as hangers, braces, struts, clip angles, anchors, bolts, nuts, welds, etc., as required to properly support and rigidly fasten and anchor same in place and to steel, concrete, masonry and all other connecting and adjoining work.

2. All light steel framing steel shall be furnished and erected in accordance with the applicable requirements of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" by the American Institute of Steel Construction and as specified herein.

D. Steel Gratings and Frames

1. Provide hot dipped galvanized steel gratings complying with FS RR-G-661 with rectangular cross bars welded to bearing bars. Bars to have plain wearing surface.
2. Manufacturer: Provide gratings manufactured by Reliance, Borden, or Irving Subway Grating.
3. Hinged Section: Provide hinged sections in areaway gratings where required by the drawings. Each hinged section up to 4'-0" wide shall be provided with two (2) five knuckle, fast pin, regular weight, plain bearing, wrought bronze butt hinges. Each hinged section over 4'-0" wide shall be provided with three (3) butt hinges. Hinged sections shall have provisions for padlocking on the underside.
4. Furnish grating frames, with corners mitered, welded and ground smooth, and with welded-on straps for secure anchorage into concrete. Frames and anchors to be galvanized.
5. Structural Performance: Provide gratings capable of withstanding the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections:
  - a. Floors: Capable of withstanding a uniform load of 250 lbf/sq. ft. or a concentrated load of 3000 lbf, whichever produces the greater stress.
  - b. Walkways and Elevated Platforms Other Than Exits: Capable of withstanding a uniform load of 60 lbf/sq. ft. Limit deflection to L/360 or 1/4", whichever is less.
  - c. Walkways and Elevated Platforms Used as Exits: Capable of withstanding a uniform of 100 lbf/sq. ft. or a concentrated load of 300 lbf on an area of 4 sq. in., whichever produces the greater stress. Limit deflection to L/360 or 1/4", whichever is less.
  - d. Sidewalks and Vehicular Driveways: Capable of withstanding a uniform load of 250 lbf/sq. ft. or a concentrated load of 8000 lbf, whichever produces the greater stress.
6. House Trap Pit Cover: Provide 36" x 36".

- E. Miscellaneous Steel Trim: Provide shapes and sizes for profiles shown. Except as otherwise indicated, fabricate units from structural steel shapes and plates and steel bars, with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings and anchorages as required for coordination of assembly and installation with other work.



**F. Masonry Support Steel**

1. Provide galvanized steel, relieving angles, plates, accessories and other steel shapes for masonry support steel; for lintels refer to Para. E. herein.
2. Fabricate masonry support steel to allow final adjustment with the closest tolerances possible. Relieving angles which require cutting to fit masonry flashing shall be straightened without deflections.
3. Coordinate masonry support system with concrete work for locations of wedge inserts.
4. Install to meet requirements of building masonry work, face brick coursing and stone placement. Coordinate final adjustments with masonry work as work progresses.

**G. Sleeves in Concrete Walls and Slabs**

1. Sleeves through concrete walls shall be of Schedule 40 steel pipe with i.d. two (2) inches larger than o.d. of pipe or conduit (including insulation, if any) to be accommodated. Sleeves shall project one-half (1/2) inch on each side of finished wall. Provide rectangular one-quarter (1/4) inch steel plate collar at center, continuously welded to the perimeter of the sleeve, and six (6) inches wider than the o.d.
2. Slots in slabs shall be 12 gauge steel sheet, galvanized, of dimensions indicated, with strap anchors welded in place not more than twelve (12) inches on centers.

**H. Channel Framing System**

1. Product: Channel Framing System by Unistrut or equal by Hilti and Kindorf. Cold-formed metal channels with continuous slot complying with MFMA-3.
2. Material
  - a. Channel shall be equal to Unistrut P1000/5000/5500 series, 1 5/8" wide, 12 ga. steel channels.
  - b. At all locations, unless otherwise noted, use steel complying with ASTM A653, with G90 coating – equal to pregalvanized 'PG' finish by Unistrut.
  - c. Provide brackets, fittings, closure plates, connection accessories, anchors, bolts, and all other parts to achieve performance defined below and design intent indicated on drawings, with similar 'PG' finish.
3. Performance: Provide steel channel framing system as indicated or required to support countertops, benches and polycarbonate panels.
  - a. Countertops and benches: Provide supports to withstand a concentrated load of not less than four hundred (400) lbs. applied at any point with a deflection not to exceed L/240 for the length of the countertop/bench.
  - b. Polycarbonate support: Provide support channels as indicated to withstand a concentrated load of not less than three hundred (300) lbs. applied at any point with a deflection not to exceed L/240 for the length of the support.

I. Glazing Channels and Shoes

1. Glazing Shoe: Shoe Molding #1142 w/#8711 Setting Block by Julius Blum & Co., or approved equal by C.R. Laurence Company or U.S. Horizon.
2. Glazing Channel: channel of the size, thickness and profile indicated on the drawings, by C.R. Laurence, Julius Blum & Co., U.S. Horizon, or approved equal.
3. Material: Extruded aluminum with clear anodized finish; as specified herein, in paragraph 2.1.A.13.

J. Acoustic Barrier Panel

1. Product: Provide insulated double wall construction acoustic barrier wall panels by the following manufacturers or equal products that comply with performance requirements:
  - a. NoiseBlack Barrier Wall by Kinetics Noise Control, Inc,
  - b. Noishiled Type FS by Industrial Acoustics Company,
  - c. Compressor Sound Enclosures by Behrens and Assoc. Environmental Noise Control, Inc.
2. Panel Construction:
  - a. Panel modules shall be constructed of galvanealed sheets manufactured in accordance with the requirements of ASTM A924 coated to ASTM A 653 specifications, with a solid outer shell of 16 ga, minimum thickness and a perforated inner shell of a minimum of 22 ga. All panel internal reinforcing members shall be minimum 18 ga. G90 galvanized steel. Modules shall be non-welded, free draining and free of pockets or cavities which may collect water.
  - b. Acoustic fill material shall be inert, non-corrosive, mildew-resistant, non-combustible, vermin-proof, non-hygroscopic and inherently suitable for wet/dry, freeze/thaw cycles. Fill material shall be free draining self supporting and shall retain physical and sound absorptive characteristics after long-term exposure to the elements. Use of a moisture barrier is not permitted.
  - c. The structural members shall be designed as a field bolt-together system. All holes in column webs, backer angles and base plates shall be factory drilled. All nuts, bolts and washers to be supplied by barrier wall system manufacturer. Field welding of structural components is not permitted.
3. Performance:
  - a. The barrier shall be designed in accordance with the requirements of the latest edition of the AASHTO Guide Specification for the Structural Design of Sound Barriers.

- b. The barrier shall incorporate absorptive sound material to prevent reverberation of noise between walls and noise source, and noise reflections to noise sensitive areas of the community.
  - c. The barrier surface facing the noise source shall have a minimum Noise Reduction Coefficient of .95 at each of the 1/3 octave band center frequencies of 125, 250, 500 and 1000Hz.
  - d. The Sound Transmission Loss of the wall modules shall be a minimum of 20dB at each of the 1/3 octave band center frequencies of 125, 250, 500 and 1000Hz.
  - e. The manufacturer shall provide certified independent test data indicating sound absorption and transmission loss characteristics of the panel assembly. Test data must be obtained through independent tests conducted in a NVLAP accredited laboratory in accordance with ASTM E90, Standard Recommended Practice for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and ASTM C423, Standard Method of Test for Sound Absorption of Acoustic Materials in Reverberant Rooms
4. Finish: Modules shall be coated in the factory with electrostatically-charge applied polyester powder coating or high-performance fluoropolymer coating; color to be selected by Commissioner from manufacturer's standard colors.

### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions where miscellaneous metal is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

#### 3.2 ERECTION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry, or similar construction.
- C. Fitting Connections: Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot dip galvanized after fabrication, and are intended for bolted or screwed field connections.

- D. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance, and quality of welds made, and methods used in correcting welding work.
- E. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- F. Field Touch-Up of Galvanized Surfaces: Touch-up shop applied galvanized coatings damaged during handling and installation. Use galvanizing repair coating specified herein for galvanized surfaces.

END OF SECTION

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SECTION 05 70 00  
DECORATIVE METAL

PART 1 GENERAL

1.1 SUMMARY

- A. Provide the following metal fabrications:
- B. Work of this Section includes all labor, materials, equipment and services necessary to complete the ornamental metals, including heavy gauge stainless steel and non-ferrous metal products which are used in building construction for functional, architectural and decorative effects and which are not a part of other metal systems specified in other Sections. The extent of these items is indicated on the drawings and/or specified herein, including but not limited to, the following:
1. Aluminum roof fascia.
  2. Aluminum soffit fascia on Multi-Purpose Room soffit.
  3. Aluminum angle cladding on Exterior Storage.
  4. Aluminum channel and plate 'Library' sign
  5. Steel handrail at Interior Court Stairs.
  6. Steel frame and base for Interior Court benches.
  7. Steel coat rack and shelf in Hall.
  8. Assorted aluminum angles and plates.
  9. Assorted stainless steel and aluminum trim pieces.
- C. Related Requirements:
1. Division 01: DDC General Conditions.
  2. Division 03 Section "Cast in Place Concrete"
  3. Division 04 Section "Masonry Assemblies"
  4. Division 05 Section "Steel Decking"
  5. Division 05 Section "Metal Fabrications."
  6. Division 06 Section "Rough Carpentry."
  7. Division 07 Section "Waterproofing."
  8. Division 07 Section "Joint Sealers."

## 1.2 SUSTAINABLE DESIGN REQUIREMENTS

- A. The Contractor is to implement practices and procedures to meet the Project's Sustainable Design goals, which include achieving LEED Silver. The Contractor shall ensure that the requirements related to these goals, as defined in this Section and in Related Sections of the Contract Documents, are implemented. Substitutions, or other changes to the Work proposed by the Contractor or their Subcontractors, shall not be allowed if such changes compromise the Project's Sustainable Design goals.
- B. The Contractor is to efficiently use resources and energy while executing the Work of this Section. Resource efficient aspects to be considered in completing this Project include the use of techniques that minimize waste generation, reuse of construction materials on site where possible, and recycling of waste generated during the construction process.
- C. Performance Requirements: The following criteria are required for the products included in this section
1. All steel shall contain a minimum of 50% (combined) pre-consumer/post-consumer recycled content.
  2. Adhesives, sealants, paints and coatings used for the work of this section shall meet the Volatile Organic Compound (VOC) limits specified in Section 018113 "Sustainable Design Requirements," and below where applicable.
  3. Require mills and fabricators have ISO14001 certification. Maximize the re-use of salvaged steel (as approved by the Engineer of Record) and, for work on existing buildings, alert the design team to any existing steel which could be re-used but has not been indicated on the drawings.
  4. Maximize the recycled content of all steel products.
  5. Design details penetrating the façade strictly in accordance with the architectural and structural directives.
  6. Where possible all connections should be made using bolted as opposed to welded details.
  7. Where welding is required use Submerged Arc Welding (SAW). The Gas Metal Arc Welding (GMAW) shall be used were SAW is not applicable (such as for angled connections and anything irregular or short). Field welding shall be allowed only in special circumstances; in such cases Flux Core Arc welding (FCAW) shall be specified with the use of portable fume exhaust system.
  8. Use surface preparation techniques that minimize the use of halogenated solvents and solvents classified as volatile organic compounds. Consider using 'weathering steel' (ASTM A 847) for exterior steel with the approval of the Commissioner and Engineer of Record.
  9. Use high strength HSS round tubes instead of A36 Steel pipes with approval of the Engineer of Record.

### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's, fabricator's and finisher's specifications and installation instructions for products used in ornamental metal work, including finishing materials and methods.
- B. Shop drawings: Submit for all items of work of this Section, as enumerated under paragraph 1.1, showing locations, layouts, materials, thicknesses, finishes, dimensions, construction, relation to adjoining construction, erection details, profiles, jointing and all other details to fully illustrate the work of this Section.
- C. Samples: Submit fabricated samples (of sufficient size to fully show construction, materials and finishes) of all items of work as enumerated under paragraph 1.1 herein.
- D. Submit LEED Certification as follows:
  - 1. LEED Materials Certification Form: For all installed products and materials of this Section, complete the "Environmental Materials Reporting Form" (attached to end of Section 018113 "Sustainable Design Requirements"). Information to be supplied for this Form shall include:
    - a. Cost breakdowns for materials included in the Contractor or sub-contractor's Work. Material cost does not include costs associated with labor and equipment.
    - b. The percentages (by weight) of pre-consumer and/or post-consumer recycled content in the supplied product(s).
    - c. Indication of whether the raw materials have been extracted, harvested or recovered, as well as the final product has been manufactured (location of final assembly), within 500 miles of the project site.
  - 2. VOC Reporting Form: For all installed products and materials of this Section, complete the "VOC Reporting Form" (attached to end of Section 018113 "Sustainable Design Requirements"). Information to be supplied for this Form shall include:
    - a. Provide generic name by means of product type or application of all field-applied interior adhesives, sealants, paints, and coatings in this Section.
    - b. Provide corresponding referenced standard limits.
    - c. Provide full name of supplied product(s) and vendor or manufacturer for each product in this Section.
    - d. For all field-applied interior adhesives, sealants, paints, and coatings in this Section, provide Volatile Organic Compound (VOC) content in grams/liter or lbs./gallon.
  - 3. Letters of Certification: Provided by the manufacturer on the manufacturer's letterhead, verifying the amount of recycled content.
  - 4. Product Cut Sheets: For all materials that meet the sustainable design performance criteria as per the LEED Performance Requirements of this section.



5. Material Safety Data Sheets (MSDS): For all applicable products. Applicable products include, but are not limited to, adhesives, sealants, paints, and coatings applied to the interior of the building. MSDS shall indicate the Volatile Organic Compound (VOC) content of products submitted. If an MSDS does not indicate VOC content, then product data sheets, manufacturer's literature, or certification letter indicating a product's VOC content can be submitted with the MSDS.
6. Assemble required LEED Submittal information into one (1) package for each Specification Section or sub-contractor. Incomplete or inaccurate LEED Submittals may be used as the basis for rejecting the submittal products or assemblies.

#### 1.4 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible, to ensure proper fitting of the work. However, do not delay job progress; allow for adjustments and fitting where taking of field measurements before fabrication might delay the work.
- C. Shop Assembly: Insofar as practicable, fitting and assembly of work shall be done in shop. Work that cannot be permanently shop assembled, shall be completely assembled, marked and disassembled in shop before shipment to insure proper assembly in field. Shop assemble work in largest practical sizes to minimize field work.

#### 1.5 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. Aluminum
  1. Alloy and Temper: Provide alloy and temper as indicated or as otherwise recommended by the aluminum producer or finisher.
  2. Aluminum Extrusions, Bars and Shapes: Alloy and temper recommended by aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T6.
  3. Extruded Pipe and Tube: ASTM B 429, alloy 6063-T6.
  4. Aluminum Plate and Sheet: Alloy and temper recommended by aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 209, alloy 6061-T6.

5. Bars, Rods and Wire: ASTM B 211.
  6. Drawn Seamless Tube: ASTM B 483, alloy 6063-T832.
  7. Castings: ASTM B 26; alloy A356-T6.
  8. Forgings: ASTM B 247, alloy 6061-T6.
- B. Stainless Steel
1. Pipe: ASTM A 312, Grade TP 304
  2. Sheet, Strip, Flat Bar and Plate: ASTM A 666, Type 304.
  3. Tubing: ASTM A 554, Grade MT 304.
  4. Castings: ASTM A 743A, Grade CF 8 or CF 20.
  5. Bars and Shapes: ASTM A 276, Type 304.
  6. Wire Rope: 1 by 19 wire rope made from wire complying with ASTM A 492, Type 316.
- C. Malleable Iron Castings
1. ASTM A 48, Class 30, and shall be uniform in quality, free from blow holes, porosity, hard spots, shrinkage defects, swells, cracks or other defects. Surfaces shall be smooth and true to pattern.
- D. Steel (Carbon) for Concealed Supports Only
1. Structural Shapes: ASTM A 36.
  2. Plates (for forming or bending cold): ASTM A 283, Grade C.
  3. Steel Sheets: ASTM A 366, Grade 1.
  4. Shop prime with rust inhibitive primer equal to Series 88 Azeron made by Tnemec, or approved equal made by Benjamin Moore or Sherwin Williams.
- E. Auxiliary Materials:
1. Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of the metal to be welded, and as required for color match, strength and compatibility in the fabricated items.
  2. Fasteners: Furnish basic metal and alloy, matching finished color and texture as the metal being fastened, unless otherwise indicated. Provide Phillips flat-head screws for exposed fasteners, unless otherwise indicated.
  3. Anchors and Inserts: Either furnish inserts to be set in concrete or masonry work, or provide other anchoring devices as required for the installation of ornamental metal items. Provide toothed steel or lead shield expansion bolt devices for drilled-in-place anchors. Provide galvanized or cadmium-coated anchors and inserts for exterior installations. Provide units with exposed surfaces matching the texture and finish of the metal item anchored.

4. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).
5. Cast-in-Place and Preinstalled Anchors: Anchors fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete.

## 2.2 FABRICATION

- A. **Cutting**: Cut metal by sawing, shearing or blanking. Flame cutting will be permitted only if cut edges are ground back to clean, smooth edges. Make cuts accurate, clean, sharp, square and free of burrs, without deforming adjacent surfaces or metals.
- B. **Holes**: Drill or cleanly punch holes (do not burn), so that holes will be accurate, clean, neat and sharp without deforming adjacent surfaces or metals.
- C. **Connections**
  1. Make connections with tight joints, capable of developing full strength of member, flush unless indicated otherwise, formed to exclude water where exposed to water. Locate joints where indicated on drawings. Provide connections to allow for thermal movement of metal at locations and by methods approved by Commissioner. For work exposed to view, use concealed fasteners (unless welded or other connections indicated) with joints accurately fitted, flush and rigidly secured with hairline contacts.
  2. **Welding**: Welding shall be in accordance with recommendations of the American Welding Society and shall be done with electrodes and/or methods recommended by the manufacturers of the metals being welded. Welds shall be continuous, except where spot welding is specifically permitted. Welds exposed to view shall be ground flush and dressed smooth with and to match finish of adjoining surfaces so that joint will not be visible; undercut metal edges where welds are required to be ground flush and dressed smooth. All welds on or behind surfaces which will be exposed to view shall be done so that finished surface will be free of imperfections such as pits, runs, splatter, cracks, warping, dimpling, depressions or other forms of distortion or discoloration. Remove weld splatter and welding oxides from all welded surfaces.
  3. **Bolts and Screws**: Make threaded connections tight with threads entirely concealed. Use lock nuts. Bolts and screw heads, where shown to be exposed to view, shall be flat and countersunk. Cut off projecting ends of exposed bolts and screws flush with nuts of adjacent metal.
- D. **Operating Mechanism**: Operating devices, mechanism and hardware used in connection with this work shall be fabricated, assembled, installed and adjusted after installation so that they will operate smoothly, freely, noiselessly and without excessive friction.
- E. **Built-In Work**: Furnish anchor bolts, inserts, plates and any other anchorage devices, and all other items for architectural metal work to be built into concrete, masonry, or work of other trades, with necessary templates and instructions, and in ample time to facilitate proper placing and installation.
- F. **Supplementary Parts**: Provide as necessary to complete each item of work, even though such supplementary parts are not shown or specified.

- G. Coordination: Accurately cut, fit, drill and tap work of this Section to accommodate and fit work of other trades. Furnish or obtain, as applicable, templates and drawings to or from applicable trades for proper coordination of this work.
- H. Make up wire-ropes assemblies in the shop to field-measured dimensions with fittings machine swaged. Minimize amount of turnbuckle take-up used for dimensional adjustment so maximum amount is available for tensioning wire ropes. Tag wire-ropes assemblies and fittings to identify installation locations and orientations for coordinated installation.
- I. Exposed Work: In addition to requirements specified herein or shown on drawings, all surfaces exposed to view shall be clean, and free from dirt, stains, grease, scratches, distortions, waves, dents, buckles, tool marks, burrs and other defects which mar appearance of finished work. Ornamental metal work exposed to view shall be straight and true to line or curve, smooth arrises and angles as sharp as practicable, miters formed in true alignment, profiles accurately intersecting, and with joints carefully matched to produce continuity of line and design. Exposed fastenings, where permitted, shall be of the same material, color and finish as the metal to which applied, unless otherwise indicated, and shall be of the smallest practicable size.
- J. Materials used shall be of such strength, thickness and alloy that they are capable of meeting all standards and descriptions specified herein and as detailed on drawings.

### 2.3 SHOP FINISHING

#### A. General

- 1. Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations, except as otherwise indicated.
- 2. Protect mechanical finishes on exposed surfaces from damage by application of strippable temporary protective covering prior to shipment.
- 3. Corrosion Protection: Coat concealed surfaces which will be in contact with concrete, masonry, wood or dissimilar metals, in exterior work and work to be built into exterior and below grade walls and decks, with a heavy coat of bituminous paint. Do not extend coating onto exposed surfaces.

#### B. Aluminum

- 1. Class I, Clear Anodic Finish: AA-M12C22A41 Medium satin directional textured mechanical finish; inhibited chemical cleaning; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker complying with AAMA 607.1.
- 2. Class II, Clear Anodic Finish: AA-M12C22A31 Medium satin directional textured mechanical finish; inhibited chemical cleaning; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker complying with AAMA 607.1. Interior use only.
- 3. Baked Enamel Finish: AA-C21C42R1x, Organic Coating: Thermosetting modified acrylic enamel primer/topcoat system complying with AAMA 603.8 except with minimum dry film thickness of 1.5 mils; medium gloss.
- 4. High Performance Coating: AA-C12C42R1x, Fluorocarbon Two-Coat System: Manufacturer's standard two-coat, thermo-cured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less

than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605-98.

C. Stainless Steel

1. Remove or blend tool and die marks and stretch lines into finish.
2. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
3. Satin, Directional Polish: No. 6 finish.
4. When polishing is complete, passivate and rinse surfaces. Remove foreign matter and leave surface chemically dry.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where ornamental metal work is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. General: Install work of this Section square, plumb, straight, true to line or radius, accurately fitted and located, with flush, tight hairline joints (except as otherwise indicated or to allow for thermal movement), with provisions for other trades, with provisions to allow for thermal movement, with provisions to exclude water where exposed to weather, and with attachment devices as required for secure and rigid installation. It is the responsibility of the Contractor to assure himself that shop fabricated architectural metal items will properly fit the field condition. In cases where the shop fabricated architectural metal items do not fit the field condition, the item shall be returned to the shop for correction.

B. Attachments

1. Unless otherwise indicated, work to be built into concrete or masonry shall be anchored with shop welded on galvanized steel strap anchors; work to be attached to concrete or masonry shall be anchored by bolts into embedded inserts or expansion shields; work attached to structural steel shall be anchored by welds or bolts; work attached to metals other than structural steel shall be anchored by bolts or screws. Power actuated fasteners not permitted unless approved by Commissioner. Provide all supplementary parts necessary to complete each item of work of this Section.
2. All attachment devices shall be of type, size and spacing to suit condition and as approved by Commissioner. Provide shims, slotted holes, or other means necessary for leveling, plumbing and other required adjustments. Attachment devices for work exposed to view shall be concealed, unless indicated otherwise. Where bolts or screws are permitted in work exposed to view, they shall be oval head and counter sunk, unless otherwise noted, with projecting end cut off flush with nuts or adjacent material, and shall match adjacent surfaces.

3. Do all necessary drilling, tapping, cutting or other preparations of surrounding construction in the field accurately, neatly and as necessary for the attachment and support of work of this Section, but obtain Commissioner's approval prior to such preparation to work of others.
- C. Tolerances: All work of this Section shall be plumb, square, level, true to radius and correctly aligned within the following limitations:
    1. Offset from true horizontal, vertical and design location shall not exceed 1/16" per ten (10) feet of length for any component, not cumulative.
    2. Maximum offset from true alignment between abutting components shall not exceed 1/32".
  - D. All railings shall be installed to withstand loads as required by prevailing Building Code.
  - E. Do not cut or abrade finishes which cannot be completely restored in the field. Return items with such finishes to the shop for required alterations, followed by complete refinishing, or provide new units at Contractor's option.
  - F. Install concealed gaskets and joint fillers as the work progresses, so as to make the work soundproof or lightproof as required.
  - G. Restore protective coverings which 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.
  - H. Retain protective coverings intact and remove simultaneously from similarly finished items to preclude non-uniform oxidation and discoloration.
  - I. Field Welding: Comply with AWS Code for the procedures of manual shielded metal-arc welding, the appearance and quality of welds made, and the methods used in correcting welding work.

### 3.3 CLEANING

- A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.
- B. Clean copper alloys according to metal finisher's written instructions in a manner that leaves an undamaged and uniform finish matching approved Sample.

### 3.4 PROTECTION

- A. Protect finishes of ornamental metal from damage during construction period with temporary protective coverings approved by ornamental metal fabricator. Remove protective covering at the time of Substantial Completion.
- B. Restore finishes damaged during construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION

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SECTION 06 20 00  
CARPENTRY

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; use of regional materials; use of certified wood; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the carpentry work as shown on the drawings and/or specified herein, including but not limited to, the following:
  - 1. Blocking and miscellaneous wood.
  - 2. Plywood wall lining for telephone and electric closets.
  - 3. Plywood sheathing.
  - 4. Rough hardware.
  - 5. Installation only of finish hardware.
  - 6. Installation only of doors and hollow metal frames.
  - 7. Temporary protection furnished by Carpentry trades.

1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions
- B. Roofing - Section 07 52 00.
- C. Steel doors and frames - Section 08 11 13.
- D. Wood Doors – Section 08 14 00
- E. Finish hardware - Section 08 71 00.



#### 1.4 QUALITY ASSURANCE

- A. Lumber Standard: Comply with PS 20.
- B. Plywood Standard: Comply with PS 1 and American Plywood Assoc. (APA).
- C. Shop fabricate carpentry work to the extent feasible and where shop fabrication will result in better workmanship than feasible for on-site fabrication.
- D. Grade Marks: Identify lumber and plywood by official grade mark.
  - 1. Lumber: Grade stamp to contain symbol of grading agency certified by Board of Review, American Lumber Standards Committee, mill number or name, grade of lumber, species grouping or combination designation, rules under which graded where applicable, and condition of seasoning at time of manufacture.
    - a. S-Dry: Maximum nineteen (19) percent moisture content as per ASTM D 2016.
- E. Installation of doors, frames and hardware shall conform to the minimum standards of "Installation Guides for Doors and Hardware" of the Door and Hardware Institute.

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Building Requirements. LEED Building submittals shall include the following, as applicable:

- 1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
- 2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
- 3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate

the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).

4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Pressure Treatment: Include certification by treating plant stating chemicals and process used, net amount of salts retained and conformance with applicable standards.
  - C. Fire-Retardant Treatment: Include certification by treating plant that treatment material complies with governing ordinances and that treatment will not bleed through finished surfaces.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 PRODUCT HANDLING

- A. Deliver carpentry materials to the site ready to use with each piece of lumber clearly marked as to grade, type and mill, and place in an area protected from the elements.
- B. Deliver rough hardware in sealed kegs and/or other containers which shall bear labels as to type and kind.
- C. Pile lumber for rough usage, when delivered to the site in stacks to insure drainage and with a minimum clearance of six (6) inches above grade. Cover stacks with tarpaulins or other watertight coverings. Store grounds and similar small sized lumber inside the building as soon as possible after delivery.
- D. Do not store seasoned lumber in wet or damp portions of the building.
- E. Protect fire retardant treated materials against high humidity and moisture during storage and erection.
- F. Remove delivered materials which do not conform to specified grading rules or are otherwise not suitable for installation from the job site and replace with acceptable materials.

- G. All items specified in Section 087100 of this specification entitled "Finish Hardware" shall be received, accounted for, stored and applied under this Section.
- H. Hardware shall be sorted and stored in space assigned by Contractor and shall be kept at all times under lock and key. The safety and preservation of all items delivered will be the responsibility of the Contractor.

## 1.8 JOB CONDITIONS

- A. Installer must examine the substrates and supporting structure and the conditions under which the carpentry work is to be installed, and notify the Contractor in writing of conditions detrimental to the work. Do not proceed with the installation until unsatisfactory conditions have been corrected in a manner acceptable to the Installer and the Commissioner.
- B. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other work.

## PART 2 PRODUCTS

### 2.1 WOOD MATERIAL

#### A. General

1. All wood shall be sound, flat, straight, well seasoned, thoroughly dry and free from all defects. Warped or twisted wood shall not be used.
2. For miscellaneous wood blocking, grounds, furring as required, use Utility Grade Coastal Douglas Fir or Southern Pine, free from knots, shakes, rot or other defects, straight, square edges and straight grain, air seasoned with maximum moisture content of nineteen (19) percent. Wood shall be S4S, S-Dry, complying with PS-20.
3. Plywood and rough carpentry for telephone and electric closets, provide 3/4" thick C-D EXT-APA plywood, fire retardant treated as specified herein.
4. Plywood Sheathing: Provide APA Structural 1 Rated Sheathing, Exposure 1, with span rating to suit stud spacing; thickness as noted on drawings.

#### B. Wood Treatment

1. All interior wood material specified herein shall be fire retardant treated to comply with the AWPA standards (C20 for lumber, C27 for plywood) for pressure impregnation with fire retardant chemical to achieve a flame spread rating of not more than 25 (UL Class "FR-S") when tested in accordance with UL Test 723 or ASTM E 84. The fire retardant chemicals used to treat the lumber must comply with FR-1 of AWPA Standard P17 and be free of halogens, sulfates and ammonium phosphate.
  - a. After treatment, kiln dry to a moisture content of fifteen (15) percent; if wood is to be painted or finished, kiln dry to a moisture content of twelve (12) percent. Treatment shall be equal to "Dricon" made by Arch Wood

Protection Inc. or approved equal. Provide UL approved identification on treated materials.

2. For exterior blocking, roofing and sheet metal, pressure treat wood with copper azole, Type A (CBA-A); ammoniacal copper quat (ACQ) or similar preservative product that contains no arsenic or chromium. Preservative shall comply with AWPA Standard C-2 for lumber and C-9 for plywood, (.25 lbs./cubic foot of chemical in wood).
  - a. After treatment, kiln dry to a maximum moisture content of fifteen (15) percent. Treatment shall be equal to "Wolmanized Natural Select" made by Arch Wood Protection Inc. or approved equal.
3. Treated wood which is cut or otherwise damaged shall be further treated in accordance with the AWPA Standard M-4.

## 2.2 HARDWARE

- A. Rough Hardware for Treated Woods and Exterior Use: Hot-dipped galvanized or Type 304 stainless steel.
- B. Nails: Common steel wire, untreated for interior work as per ASTM F 1667.
- C. Bolts: Standard mild steel, square head machine bolts with square nuts and malleable iron or steel plate washers or carriage bolts with square nuts and cut washers conforming to the following:
  1. Bolts: ASTM A 307, Grade A.
  2. Nuts: ASTM A 563.
  3. Lag Screws and Bolts: ASME B 18.2.1.
- D. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
  1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
  2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2; use stainless steel for treated woods and exterior use.
- E. Wood Screws: ASME B 18.6.1.
- F. Concrete and Masonry Anchors: Standard expansion-shield self-drilling type concrete anchors where so shown or noted on the drawings, or where approved by the Commissioner, unless otherwise noted on the drawings.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where carpentry is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 INSTALLATION OF FINISH HARDWARE

- A. All finishing hardware specified in Section 087100 of this specification entitled "Finish Hardware" shall be received, accounted for, stored and applied under this Section.
- B. Hardware shall be sorted and stored in space assigned by Contractor and shall be kept at all times under lock and key. The safety and preservation of all items delivered will be the responsibility of the Contractor.
- C. Hardware shall be carefully fitted and securely attached, in accordance with these specifications and the instructions of the various manufacturers.
- D. Unless otherwise noted, mount hardware units at heights established in Section 081113.
- E. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, re-install each item. Do not install surface-mounted items until finishes have been completed on the substrate.
- F. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- G. Drill and countersink units which are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- H. Cut and fit threshold and floor covers to profile of door frames, with mitered corners and hair-line joints. Join units with concealed welds or concealed mechanical joints. Cut smooth openings for spindles, bolts and similar items, if any.
- I. All keys used shall be construction keys which are to be tagged with fiber discs as approved, clearly labeled with identifying inscriptions and then neatly arranged in a temporary cabinet. All construction keys shall be returned to the City of New York.
- J. Adjusting and Cleaning
  - 1. Adjust and check each operating item of hardware and each door, to ensure proper operation and function of every unit. Lubricate moving parts with type lubrication recommended by manufacturer (graphite type if no other recommended). Replace units which cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.
  - 2. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make a final check and adjustment of all hardware items in such space or area. Clean and re-lubricate operating items as necessary to restore proper function and finish of hardware and doors. Adjust

door control devices to compensate for final operation of heating and ventilating equipment.

### 3.3 INSTALLATION OF DOORS AND FRAMES

#### A. Preparation

1. Remove welded-in shipping spreaders installed at factory.
2. Prior to installation and with installation spreaders in place, adjust and securely brace standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
  - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
  - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - d. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
3. Drill and tap doors and frames to receive non-templated mortised and surface-mounted door hardware.

#### B. Installation

1. General: Provide doors and frames of sizes, thicknesses, and designs indicated. Install steel doors and frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
2. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
  - a. Install frames in accordance with ANSI 250.11-20001, Recommended Erection Instructions for Steel Frames, unless more stringent requirements are specified herein.
  - b. At fire-protection-rated openings, install frames according to NFPA 80.
  - c. Where frames are fabricated in sections due to shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
  - d. Install frames with removable glazing stops located on secure side of opening.
  - e. Frames set in masonry walls shall have door silencers installed in frames before grouting.
  - f. Remove temporary braces necessary for installation only after frames have been properly set and secured.
  - g. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
3. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with post-installed expansion anchors.

- a. Floor anchors may be set with powder-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.
4. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames conforming to the requirements of Section 072100 – "Thermal Insulation."
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar; refer to Section 042000 "Unit Masonry" for installation of frames in masonry walls.
6. In-Place Concrete or Masonry Construction: Secure frames in place with post-installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
7. In-Place Gypsum Board Partitions: Secure frames in place with post-installed expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
8. In-Place Structural Steel Posts: Secure frames in place as detailed on the drawings and in accordance with manufacturer's written instructions.
9. Ceiling Struts: Extend struts vertically from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb members.
10. Installation Tolerances: Adjust steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
  - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
  - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
11. Steel Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
  - a. Non-Fire-Rated Standard Steel Doors:
    - 1). Jambs and Head: 1/8 inch plus or minus 1/16 inch.
    - 2). Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
    - 3). Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
    - 4). Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
  - b. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
12. Glazing: Comply with installation requirements in Division 8 Section "Glass and Glazing" and with standard steel door and frame manufacturer's written instructions.

- a. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c., and not more than 2 inches o.c. from each corner.
- C. Adjustments: Check and readjust operating finish hardware items just prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including doors or frames which are warped, bowed or otherwise unacceptable.

### 3.4 BLOCKING AND MISCELLANEOUS WOOD

#### A. General

1. Erect rough carpentry true to line, levels and dimensions required; squared, aligned, plumbed, and securely fastened in place.
2. Shim where required to true up furring, blocking and the like. Use wood or metal shims only.
3. Do all cutting, fitting, drilling and tapping of other work as required to secure work in place and to perform the work included herein. Do all the cutting and fitting of carpentry work, for the work of other trades as required.

#### B. Blocking and Miscellaneous Wood

1. Furnish and install all wood grounds, furring, blocking, curbs, bucks, nailers, etc., that may be necessary and required in connection with the carpentry and with the work described for any other trades and including required carpentry for electrical fixtures. All blocking and nailers shall be continuous wherever required, whether or not so indicated.
2. Blocking shall be as required for the proper installation of the finished work and for items in mechanical sections as required. Blocking, edgings, stops, nailing strips, etc., shall be continuous, unless distinctly noted otherwise. Provide blocking as required to install all equipment. Provide blocking and nailers where shown or required to fasten interior sheet metal work.
3. Fastening for wood grounds, furring and blocking shall be of metal and of type and spacing as best suited to conditions. Hardened steel nails, expansion screws, toggle bolts, self-clinching nails, metal plugs, inserts or similar fastenings shall be used, of suitable type and size to draw the members into place and securely hold same.

#### C. Rough Lumber for Roofing and Sheet Metal

1. Furnish and install all wood nailing strips and wood blocking required in connection with respective types of roofing, fans, flashings, and sheet metal work, using preservative treated wood as herein before specified.
2. Wood blocking shall be of sizes and shapes as indicated on the drawings and/or designed for the reception of curb flashings for roof ventilators and similar items.
3. All nailing strips and blocking shall be carried out in accordance with the printed installation instructions, and/or recommendations of the accepted manufacturer of the roofing materials, and in coordination and cooperation with the sheet metal work trades.



4. All blocking and nailing strips shall be firmly secured in place using counter bored bolt and nut fastenings, or secured by any other proposed flush surfaced fastenings.
5. Wood nailing strips or blocking required to be embedded in concrete work shall be furnished in time due for placing, prior to start of concrete operations. Locations and spacings of nailing strips or blocking shall be performed in coordination with the concrete trades, as required for respective installations.

### 3.5 TELEPHONE AND ELECTRIC EQUIPMENT MOUNTING BOARDS

- A. Furnish and install 3/4" thick plywood panels to the walls of the telephone and electric equipment rooms in accordance with the requirements of the local utility company.
- B. Secure to wall using proper devices for substrates encountered, spaced twelve (12) inches o.c., maximum around the edges, 1-1/2" from corners, and in three (3) rows of three (3) each in the field. Recess fastening devices flush with the plywood surface. Adjacent panels shall be butted with 1/16" space between without lapping.

### 3.6 PLYWOOD SHEATHING

- A. Install plywood sheathing horizontally or vertically using panels continuous over 2 or more spans. Nail edges and ends over supports at 6" o.c. and at 12" o.c. over intermediate studs using 6d nails for panels not more than 1/2" thick and 8d nails for thicker panels. Allow 1/8" spacing at panel ends and 1/4" at panel edges.

### 3.7 ROUGH HARDWARE

- A. Securely fasten rough carpentry together. Nail, spike, lag screw or bolt as required by conditions encountered in the field and the Contract Documents.
- B. Provide rough or framing hardware, such as nails, screws, bolts, anchors, hangers, clips, inserts, miscellaneous fastenings, and similar items of the best quality and of the proper size and kind to adequately secure the work together and in place, in a rigid and substantial manner.
- C. Secure rough carpentry to masonry with countersunk bolts in expansion sleeves or other acceptable manner, with fastenings not more than sixteen (16) inches apart. Secure woodwork to hollow masonry with toggle bolts spaced not more than sixteen (16) inches apart.
- D. Countersink bolts in nailers and other rough woodwork and include washers and nuts. Cut bolts off flush with surfaces and peen as may be required to receive finished work.
- E. Inserts to secure wood nailers to concrete shall be malleable iron threaded inserts with 3/8" diameter bolts of length to allow for countersinking. Locate at end of each nailer and at intervals not exceeding thirty (30) inches o.c.
- F. Furnish to the mason for building into the work, or attaching the work which is to be built in, anchors, bolts, wall plates bolted to masonry, corrugated wall plugs, nailing blocks, etc., which are required for the proper fastening and installation for the work or other items as called for in this Section.
- G. Detailed instructions with sketches of necessary requirements, shall be given to the masonry trade showing the location and other details of such nailing devices.

3.8 TEMPORARY PROTECTION BY CARPENTER

- A. General: Provide temporary protection as follows:
  - 1. Temporary wood doors at exterior entrances, as required.
  - 2. Temporary protection and enclosures at exterior entrances.
  - 3. Temporary sills at door thresholds and other openings.
- B. Exterior Openings: Provide temporary enclosures for exterior openings where required, properly secured and maintained until finished work is in place. Provide a sufficient number of temporary doors to give access to the building, all provided with hardware, locks and keys.
- C. Maintenance: Maintain all temporary protection in good repair during the construction period. Remove when no longer required.
- D. Temporary Locks: Provide temporary locks, including keys, for temporary doors. Use of permanent building hardware in connection with temporary doors is prohibited.

3.9 CLEANING UP

- A. General: Keep the premises in a neat, safe and orderly condition at all times during execution of this portion of the work, free from accumulation of sawdust, cut-ends and debris.
- B. Sweeping: At the end of each working day, or more often if necessary, thoroughly sweep all surfaces where refuse from this portion of the work has settled.
  - 1. Remove the refuse to the area of the job site set aside for its storage.
  - 2. Upon completion of this portion of the work, thoroughly broom clean all surfaces.

END OF SECTION

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SECTION 06 40 00  
ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the architectural woodwork as shown on the drawings and/or specified herein, including but not limited to, the following:

1. Wood wall panels.
2. Wood ceiling panels
3. Built-in Benches.
4. Homasote wall panels.
5. Wood computer counters.
6. Wood banquette.
7. Fabric-wrapped foam cushions for banquette.
8. Wood base and wall cabinets.
9. Custom podiums.
10. Plastic laminate countertops and backsplash.
11. Wood framing and rough lumber as required for work of this Section.
12. Wood grounds, blocking, nailers, furring as required for work of this Section.
13. All rough hardware and fastenings for work of this Section.
14. Drilling concrete and masonry, drilling and/or tapping metal work, as required, for the installation of work of this Section.
15. Back painting as specified herein.
16. Shop finish of work of this Section, except items indicated herein to be shop primed only.

1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions
- B. Carpentry - Section 06 20 00.

- C. Wood doors - Section 08 14 00.
- D. Field finishing - Section 09 90 00.

#### 1.4 QUALITY STANDARDS

- A. The quality standards of the Architectural Woodwork Institute, latest edition, shall apply to all workmanship for architectural woodwork and by reference are made a part of this specification. All work shall conform to "Premium" grade requirements of the AWI Quality Standards, unless otherwise modified herein.
- B. In the event of a dispute as to the quality grade (or grades), all parties involved will (1) call upon the Architectural Woodwork Institute for an inspection under AWI's established inspection procedures, and (2) agree to abide by the decision of AWI. The cost of said inspection shall be borne by the Contractor.
- C. Employ only tradesmen experienced in the fabrication and installation of architectural woodwork.

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Building Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings

applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).

4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.

B. Shop Drawings

1. Submit shop drawings of all woodwork specified and indicated on the drawings. Shop drawings shall indicate room plans and elevations at 3/4" equals 1'-0" scale and typical construction details at 3" equals 1'-0" scale. Shop drawings shall indicate all materials, thicknesses and finishes.
2. Shop drawings shall show all finish hardware, anchors, fastenings and accessories.
3. Shop drawings shall show all jointing, joint treatment and butt jointing in veneers and plastic laminate.
4. Shop drawings for wood paneling must show complete elevations of rooms to receive paneling as well as panel matching required by these specifications.

C. Samples: Submit samples of each of the following items:

1. Plastic laminate, twelve (12) inches square, including a section of outside corner.
2. Transparent finish for each species of wood veneer laminated to substrate specified, twelve (12) inches square, for each finish specified or shown.
3. Homasote, twelve (12) inches square.
4. Each finish type of wood panel, 24" wide x 24" high.
5. Fabric-wrapped foam cushion, twelve (12) inches square.
6. Cabinet hardware.

1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.

- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 QUALIFICATIONS

- A. The work of this Section shall be provided by a firm having a minimum of three (3) years experience on projects of similar size and quality to that specified and shown.

#### 1.8 COORDINATION

- A. Coordinate the work of this Section with other appropriate Sections of the specifications to insure proper scheduling for fabrication and installation of the work specified herein
- B. Coordinate with partition and finish trades to insure that proper provisions are made for the installation of the work specified herein.
- C. Verify all dimensions in the field prior to fabrication of all Architectural Woodwork to assure proper fit.

#### 1.9 PRODUCT HANDLING

- A. All materials and work of this Section shall be protected from damage, from time of shipment from shop to final acceptance of work. Cover, ventilate, and protect work of this Section from damage caused by weather, moisture, heat, staining, dirt, abrasions, any other causes which may adversely affect appearance or use, or which may cause deterioration of finish, warping, distortion, twisting, opening of joints and seams, delamination, loosening, etc., of work of this Section.
- B. Keep all finish carpentry, millwork, and cabinet work under cover both in transit and at the premises. Do not deliver any finish carpentry, millwork or cabinet work before it is required for installation. Protect such work to avoid damage in transit, during erection and after erection until acceptance of the building; use all such methods to provide the proper protection. Remove such protection when directed by the Commissioner.
- C. Deliver finish carpentry, millwork, and cabinet work in a dry stable condition; protect same against injury and dampness. Do not store or install finish carpentry, millwork or cabinet work until after the concrete, masonry and plaster work are thoroughly dry.
- D. Damaged or defective items or work of this Section are subject to rejection and replacement with new by Contractor, at no cost to City of New York.

#### 1.10 JOB CONDITIONS

- A. Humidity and Temperature Controls: Advise Contractor of requirements for maintaining heating, cooling and ventilation in installation areas as required to reach relative humidity necessary to maintain optimum moisture content specified for woodwork.
- B. Determine equilibrium moisture content and maintain required temperature and relative humidity as required for a tolerance of plus or minus one (1) percent of the specified optimum moisture content until woodwork receives specified finishes. Refer to "Guide to Wood Species Selection", AWI, for method of determining equilibrium moisture content values.
- C. Examination of Substrate and Conditions: The installer must examine the substrate and the conditions under which the work of this Section is to be performed, and notify

the Contractor in writing of unsatisfactory conditions. Do not proceed with work under this Section until unsatisfactory conditions have been corrected in a manner acceptable to the Commissioner.

## PART 2 PRODUCTS

### 2.1 BASIC REQUIREMENTS

- A. Wood Moisture Content: Provide kiln-dried (KD) lumber with an average moisture content range of nine (9) to twelve (12) percent for exterior work and six (6) to eleven (11) percent for interior work. Maintain temperature and relative humidity during fabrication, storage and finishing operations so that moisture content values for woodwork at time of installation do not exceed seven (7) percent.
- B. Measurements: Before proceeding with woodwork required to be fitted to other construction, obtain field measurements and verify all dimensions of shop drawing details as required for accurate fit.
- C. Compatibility of Grain and Color: Commissioner reserves the right to select materials for best compatibility between visually related members and veneers.
- D. Machine and sand woodwork to comply with requirements of Standards for specified grade.
- E. Fabricate woodwork to dimensions, profiles and details shown. Rout or groove back of flat trim members, kerf backs of other wide flat members except plywood or veneered members.
- F. Miter joints by joining, splining and gluing to comply with requirements for the specified grade.
- G. Inspect each piece of lumber and plywood or each unit of woodwork after drying; do not use twisted, warped, bowed or otherwise damaged or defective wood.

### 2.2 GENERAL - MATERIALS

- A. Softwood lumber shall conform to the requirements of the latest edition of American Lumber Standards Simplified Practice Recommendation R-16. Grades shall conform to the grading rules of the Northeast Lumber Manufacturer's Association (NELMA), and shall bear its official grade and trademark and a mark of mill identification.
- B. Framing and Rough Lumber: No. 1 KD grade Southern Pine or Dense Construction grade Douglas Fir, having extreme fiber in bending stress of at least 1700 psi, surfaced four sides (S4S). Provide fire retardant treatment meeting requirements of Section 06200.
- C. Grounds, Blocking, Nailers, Furring: Southern Pine, Douglas Fir or Sitka Spruce, grade to suit particular purpose and to be straight, square edged, straight grained, surfaced four sides (S4S), and which will retain nails and screws without splitting. Provide fire retardant treatment.
- D. Lumber: AWI Section 100 with the following requirements:



1. Hardwood for Transparent Finish: Premium Grade, select American Walnut matching adjoining veneers unless otherwise shown or specified, and free from cat's eyes, bird's eyes, burls, curls or cross grains.
  2. Hardwood for Opaque Finish: Any hardwood which, when finished, will not show any grain, imperfection or other surface defects when used with the opaque finish specified.
- E. Plywood: AWI Section 200; Veneer core, particle or plywood core unless otherwise specified, and with the following requirements:
1. Hardwood: Premium Grade, Section 200, face veneers as shown or specified
  2. Particleboard: Premium Grade, Section 200, fire retardant for wall paneling only equal to Duraflake FR and Duraflake for cabinets.
  3. Edges: Banded with hardwood in accordance with Premium Grade Standards, solid where indicated.
- F. Veneers
1. Face Veneers for Transparent Finish: AWI Section 500, Premium Grade of American Walnut. Veneer must be flitch matched, sequence matched, book matched, end matched and centered balanced.
    - a. Veneer shall be laminated to plywood substrate for benches, counters, etc. or laminated to medium-density fiberboard for hung panels; see drawings for locations.
    - b. Solid edges where indicated on drawings.
  2. Face Veneers for Opaque Finish: Any closed grain hardwood veneer that, when finished, will not show grain, imperfection or other surface defects when used with the opaque finish specified.
- G. Finishing (Wood)
1. Transparent Finish for Paneling, Casework and Trim
    - a. AWI Factory Finish System No. TR-2 catalyzed lacquer.
    - b. AWI Premium Grade.
    - c. Stain: Clear.
    - d. Degree of Sheen: Satin
    - e. Filled or Unfilled Finish.
  2. Opaque Finish for Casework
    - a. AWI Factory Finish System No. TR-2
    - b. AWI Premium Grade.
    - c. Degree of Sheen: Satin

- d. No grain to show.

## 2.3 HOMASOTE

- A. Basis of Design: 'PINacclle N.C.F.R.' Class A fire rated panels by Homasote Co.; or equal product by USG Micore 300 Mineral Fiber Board or Fabricmate ReCore Single-Solution Substrate.

1. Thickness: 1/2 inch, typical.
2. Fire Hazard Classification: Class A Flame Spread rating 25 or less, Fuel Contributed 0, Smoke Developed 20 or less, per ASTM E84 and UL.
3. NCR of 0.20 or higher, per ASTM C423.
4. Basis of Design Finish: Natural. Smooth side exposed.
5. Exposed Edges: to be cut to clean, burr-free, straight and square edges.

## 2.4 METAL

### A. Steel

1. Structural Steel Shapes and Plates: ASTM A 36.
2. Hot-Rolled Carbon Steel Sheets: Commercial quality, ASTM A 569, may be used for concealed parts only. Galvanize sheets for planters.
3. Finishes
  - a. Primer for Unexposed Metal: Zinc chromate primer.

### B. Aluminum

1. Comply with the following standards for the forms and types of aluminum for the required items of work:
  - a. Alloy and Temper: Provide alloy and temper as indicated or as otherwise recommended by the aluminum producer or finisher.
  - b. Aluminum Extrusions, Bars and Shapes: Alloy and temper recommended by aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T6.
  - c. Extruded Pipe and Tube: ASTM B 429, alloy 6063-T6.
  - d. Aluminum Plate and Sheet: Alloy and temper recommended by aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 209, alloy 6061-T6.
  - e. Bars, Rods and Wire: ASTM B 211.
  - f. Drawn Seamless Tube: ASTM B 483, alloy 6063-T832.
  - g. Castings: ASTM B 26; alloy A356-T6.

- h. Forgings: ASTM B 247, alloy 6061-T6.

## 2.5 MISCELLANEOUS PRODUCTS

### A. Fasteners

1. Wood Screws: FS FF-S-111, type, size, material and finish as required for the condition of use.
2. Nails: FS FF-N-105, type, size, material and finish as required for the condition of use.
3. Anchors: Type, size, material and finish as required for the condition of use.
4. Panel Z-clips: Aluminum, mill finish, lift-off depth and of thickness and construction as required for the weights and condition of use. Products equal to Monarch Z Clips, by Eagle Moldings, Orange Aluminum or New York Metal.
5. Staples: Upholstery type staples of sufficient strength to hold fabric taut in place without sagging.

### B. Adhesives

1. For Laminating Plastic Laminate Surfaces: Melamine, phenol-resin, or resorcinol-resin complying with FS MMM-A-181; type, grade and best suited for the purpose.
2. For All Other Uses: Moisture resistant complying with FS MMM-A125, Type II, or MMM-A-188, Type I II or III.
3. All adhesives shall comply with LEED Requirements 018113 and VOC Limits in section 018419.

## 2.6 CABINETS AND PANELS WITH PLASTIC LAMINATE FINISH

### A. General

1. Fabricate all cabinetry and millwork to the "Premium Grade" standards of the AWI, Section 400.
2. Provide 3/4" thick doors, drawer fronts and fixed panels (including thickness of plastic) except where required to be thicker by Standards; and provide flush units.
3. Exposed Edges: Plastic laminate matching exposed panel surfaces. Ease exposed edge of overlap sheet.

### B. Plastic Laminate

1. Face Sheets: NEMA Publication LD3, Grade GP50, Type I, 0.05" thick, as manufactured by Formica, Nevamar, Wilson-Art. Basis of design color is 'Terril' in Matte finish (2297-58) by Formica.
2. Backing Sheets: Non-decorative, high-pressure plastic laminate, NEMA LD3, Grade BK20, 0.02" thick.
3. Edges: Finish with plastic laminate to match face and applied before face sheets

- C. Shop Assembly: All work shall be shop assembled. Work that is too large for entrance into the use area shall be fabricated in attachable sections with provisions for reconnection in the using space.
- D. Material Thicknesses: See drawings for general materials thicknesses. Minimum thickness of solid lumber for web frames, trim, bases, etc., shall be 3/4". Minimum thickness of plywood and particleboard shall be 3/4".
- E. Sizes: See drawings for woodwork sizes required. The manufacturer shall check field dimensions and verify all openings and actual field conditions prior to fabrication of work.
- F. Manufacturer is responsible for rigidity and structural stability.

## 2.7 PLASTIC LAMINATE COUNTERTOPS

- A. Grade: Same as AWI grade required for cabinet work; plastic laminate finish.
- B. Construction
  - 1. Provide back-splash and end-splash, where detailed; top-mounted square butt joint, fully covered with matching plastic laminate, eased edges.
  - 2. Exposed Counter Edges: Plastic laminate matching surface, except as otherwise indicated. Ease exposed edges of overlap sheet.
  - 3. Cut openings for equipment to be installed. Comply with equipment manufacturer's requirements, but provide internal corners of 1/8" minimum radius. Smooth saw cut and ease edges.
  - 4. Seal cut edges of counter at openings for sinks and other "wet" equipment, using waterproofing compound recommended by plastic manufacturer and compatible with laminating adhesive.

## 2.8 BUILT-IN CABINETS, COUNTERTOPS, WOODWORK WITH WOOD VENEER FINISH

- A. Construction: Details of cabinet and wood work construction shall conform to design as detailed on the drawings and shall be constructed in accordance with AWI Section 400, Premium Grade.
- B. Finishing: All work shall be factory pre-finished. No field finishing will be permitted, except minor retouching that is necessary after installation to leave work in perfect condition. Field touch-up shall be accomplished using the same finishes as originally applied at the factory. All finishes shall be free from runs, sags and other visual defects. All wood shall be thoroughly hand smoothed and hand sanded to remove all traces of machine and tool marks. All steel or other metal components shall be deburred, thoroughly cleaned and degreased prior to finishing. Requirements for surface preparation shall be in accordance with AWI Standards specified. Surfaces shall be finished as follows:
  - 1. Wood veneers shall be as specified herein, flitches to be selected by Commissioner. Veneer shall be minimum 1/28" thick.
  - 2. All wood veneer surfaces shall be given transparent finish as specified herein.

3. Backing Veneer: Provide backing veneer, of same thickness and strength as face veneer for balanced construction, where plywood surface not exposed, not semi-exposed, or not to be finished. Note that interior surface of cabinets, closets, are to be finished.
- C. Edge Banding: All visible edges of case and body members fabricated from plywood shall be banded, unless otherwise noted. Transparent finished wood veneer panels shall be banded with wood species to match face veneers.

## 2.9 CABINETS HARDWARE

- A. Architectural Woodwork Hardware: Provide the following items, or their approved equal, as required:
1. Hinges: Hafele concealed European style hinges, or equal by Grass or Hafele..
  2. Catches: Magnetic catches; top and bottom.
  3. Pulls: Linnea Hardware, 2" wide squared drop down back-mounted edge pull, or equal by Mockett or Hafele.
  4. Locks: Directed by the Commissioner.
  5. Drawer Slides: Accuride, Model 7434, full extension, 100 lb. capacity, or equal by Centerline or Hafele.
  6. Shelf Supports: Pin and grommet system in nickel-plated steel equal to No. 282.01.701 pin and 282.50.704 grommet made by Hafele, or equal by Vertex or Brusso.
  7. Finish: Satin Stainless Steel or nickel-plated steel.
  8. Countertop Grommet: 2-1/2" diameter plastic grommet with notched flip-top cap by Mockett, Inc. or equal by Hafele.

## 2.10 WOOD FOR RAILS, CAPS, TRIM, BASES, MOLDINGS AND FRAMES

- A. Quality Standard: For the following types of interior architectural woodwork, comply with indicated standards as applicable.
1. Standing and Running Trim: AWI Section 300.
  2. Miscellaneous Millwork: AWI Section 700.
  3. Stair Handrails: AWI Section 800.
- B. Wood Work for Transparent Finish: Except as otherwise indicated, comply with the following:
1. Grade: Premium.
  2. Species of Solid Wood: Quarter Sawn Species as noted on drawings.
- C. Woodwork for Paint Finish: Except as otherwise indicated, comply with the following:
1. Grade: Premium.

2. Species of Solid Wood: Solid, paint grade, sound clear Poplar or Birch.

#### 2.11 HARDWOOD VENEERED PLYWOOD AND MDF PANELS

- A. Type: Interior grade, hot press laminated with waterproof adhesive, pre-finished, with face veneers and core construction as specified herein.
- B. Core Construction: Shall be fire retardant treated, meeting requirements of Section 062000
  1. Plywood panels shall be multi-laminated core per Section 2.2.E above.
  2. Medium-density fiberboard core panels shall be per Section 2.2.E above and comply with LEED Requirements in Section 018113, 018116 and 018419.
- C. Thickness: 3/4" thick, or as indicated on drawings.
- D. Face Veneers: per Section 2.2.F above.
  1. American Walnut; minimum 1/28" thick.
- E. Finish: Veneers shall be finely sanded and clear factory pre-finished using AWI System noted herein.
- F. Panel Sizes: See drawings for panel sizes required.
- G. Perforated Hardwood Veneer Panels: Fabricate perforated hardwood veneered panels by means of Computer Numerical Control (CNC) milling, in patterns indicated on drawings. Holes shall not be taped with edge banding, but shall be finished.
- H. Perforation Patterns: See drawings for perforation patterns. The AutoCAD files of the panel patterns shall be provided by the Commissioner for use in generating shop drawings and in developing the milling patterns.
- I. Where wood doors are set adjacent to fixed veneered wood paneling, veneer on door shall be sequenced to fit veneer pattern; doors to meet the requirements of Section 08 14 00.

#### 2.12 UPHOLSTERED BANQUETTE CUSHIONS

- A. Type: Interior grade, closed-cell polyesther foam slab wrapped in sewn fabric cover.
- B. Foam and fabric to be Class A Flame Spread rated.
- C. Fabric cover shall have integral concealed metal zipper on bottom edge for removal from foam.
- D. Fabric: Basis of Design: Maharam Highfield by Kvadrat 465957 or approved equal.

#### 2.13 FABRICATION - GENERAL

- A. Provide lumber framing for architectural woodwork, complete with all bracing and fastening devices as required for a rigid installation, and as required to sustain the imposed loads.
- B. Do all fabrication from field measurement with provision for scribing as required to meet built-in conditions.

- C. Coordinate the work of this Section with the work of other trades.
- D. Fabricate units in largest practicable sections. Assemble in the shop for trial fit, disassemble for shipment and reassemble with concealed fasteners.
- E. Maintain relative humidity and temperature during fabrication, storage and finishing operations matching that of the areas of installation.
- F. Details indicate the required type and quality of construction. Modifications to conform to manufacturer's standards will be considered providing they comply with the Contract Documents, maintain the profiles shown and subject to acceptance by the Commissioner.
- G. Reinforcing shown is minimum. Provide additional reinforcing as required to ensure a rigid assembly. Exposed surfaces shall be free from dents, tool marks, warpage, buckle, glue and open joints, or other defects affecting serviceability or appearance. Accurately fit all joints, corners and miters. Conceal all fasteners. Make threaded connections up tight so that threads are entirely concealed.
- H. Factory finish all items where possible. Defer final touch-up, cleaning and polishing until after delivery and installation.
- I. Comply with AWI Section 1500, Premium Grade for sanding, filling countersunk fasteners, back priming and similar preparations for the finishing of architectural woodwork, as applicable to each unit of work.
- J. Prepare all countersunk wood screw attachments for wood plugs. Wood plugs shall match surrounding species and grain direction; putty filling is not acceptable.

#### 2.14 FABRICATION - SPECIFIC ITEMS

##### A. Casework

- 1. Provide casework in accordance with AWI Section 400, Premium Grade.
- 2. Include all preparations for mechanical, electrical, telephone and plumbing work required.
- 3. Provide cabinet hardware for casework as shown.
- 4. Provide dust panels in body webs and between drawer units.
- 5. Provide wood veneers for exposed surfaces as specified herein before.
- 6. Hollow core doors will not be permitted.
- 7. Provide matching veneers for edge treatments of case body members where transparent finishes are indicated or specified.
- 8. Provide drawers with slides as specified. Drawers shall not rest on web body frames.
- 9. Provide wood veneers for transparent finish, of matching and continuing grain, for drawer and door edges.

##### B. Paneling

1. General Paneling Requirements
  - a. Panel type shall be AWI, Premium Grade construction.
  - b. Panel joints shall be flush type unless otherwise shown.
  - c. Provide concealed wood blocking and framing, anchors, clips, splines, supporting and attaching devices.
  - d. Provide cut-outs to receive attachments, mechanical and electrical work as required.
2. Wood Veneer Paneling
  - a. Comply with AWI Section 500.
  - b. Provide veneers as specified and as shown, including all matching requirements. Run veneer in the direction shown.

### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions where architectural woodwork is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

#### 3.2 FRAMING

- A. Use specified framing lumber, sizes and spacing as indicated on drawings and as required to support loads.
- B. Framing shall be cut square on bearings, closely fitted, accurately set to required lines and levels, rigidly secured in place at bearings and connection with nails, lag screws and/or bolts as required by conditions.

#### 3.3 GROUNDS, BLOCKING, NAILERS AND FURRING

- A. Provide all wood grounds, blocking, nailers, furring, and the like for work of this Section, where shown and where required, dressed to size indicated or required to suit the condition. Install grounds, blocking, nailers, furring, etc., rigidly, in proper alignment, trued with a long straight edge.

#### 3.4 ROUGH HARDWARE

- A. Provide all rough hardware, such as nails, screws, bolts, anchors, hangers, clips and similar items. Hardware shall be of the proper size and kind to adequately secure the work together and in place, in a rigid and substantial manner. Use galvanized hardware at exterior walls, and at other locations where subject to moisture or where water will be present.
- B. Secure wood to concrete and to solid masonry with countersunk bolts in expansion sleeves or other approved manner, to steel with countersunk bolts, to hollow masonry



and to drywall with heavy duty countersunk toggle bolts. Space fastenings not more than sixteen (16) inches apart. Hardened cut nails, power-driven fastenings, or other suitable devices may be used where approved by the Commissioner.

- C. Connections and fastenings shall be made in such manner as will compensate for swelling and shrinkage and shall permit the work to remain permanently in place without any splitting or opening of joints.

### 3.5 INSTALLATION OF CABINET FINISH HARDWARE

- A. All items of finish hardware furnished under this Section shall be carefully fitted and secured in place as part of the work of this Section. Locations and positioning of hardware shall be subject to the Commissioner's approval. Care shall be taken not to mar or damage hardware, or other work. Install doors plumb and true. Hardware shall be fitted to assure operation without forcing.
- B. After preliminary fitting of hardware, the Contractor shall remove trim for painting and finishing work; after which he shall reinstall the hardware in a permanent manner.
- C. Upon completion of the work, before final acceptance of the building by the Commissioner, the Contractor shall, in the presence of the Commissioner, show that all hardware is in satisfactory working order; fit all keys in their respective locks and, upon acceptance of the work, shall tag and deliver all keys to the Commissioner.
- D. When directed by the Commissioner, at any time during the first year after the completion of the Contract, the Contractor shall return to the building and adjust and refit the work and hardware, and leave such items in satisfactory working order.

### 3.6 GENERAL INSTALLATION

- A. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level (including countertops), and with 1/16" maximum offset in flush adjoining surfaces, 1/8" maximum offset in revealed adjoining surfaces.
- B. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- C. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation.

### 3.7 TRIM, MOLDINGS, ETC.

- A. Install with minimum number of joints possible, using full-length pieces for each run. Stagger joints in adjacent and related members. Cope at returns, miter corner.
- B. Joints of all trim and/or moldings shall be set tight, miter exterior angles and cope interior angles. Joints, except end joints less than twelve (12) feet apart, will not be permitted in straight runs of trim and/or moldings and rails.
- C. Secure all trim and/or moldings with glue and blind nail with finishing nails. Set exposed nail heads in finished work and putty. Sand all work to remove any tool marks and irregularities.
- D. Wood shall receive finish as specified in Section 099000 - Painting.

### 3.8 VENEERED WOOD PANELS

- A. Provide a system of concealed panel hanger clips, shims and corresponding wall clips to support the panel system. Face nailing shall not be permitted.
- B. Hang the panels in the designated locations. Panels shall be straight, level, flat and flush with adjoining panels.
- C. Where reveals are indicated, keep panels spaced so that reveals are parallel and of widths shown.

### 3.9 HOMASOTE PANELS

- A. Homasote panels shall be adhered and pneumatically fastened with finish nailer to the plywood substrate.
- B. Provide a system of concealed panel hanger clips, shims and corresponding wall clips to support the panel system as indicated on drawings. Face nailing shall not be permitted.
- C. Hang the panels in the designated locations. Panels shall be straight, level, flat and flush with adjoining panels.
- D. Where reveals are indicated, keep panels spaced so that reveals are parallel and of widths shown.
- E. Field holes cut for utilities shall be smooth and straight and completely concealed by a face plate or escutcheon.

### 3.10 CABINET WORK AND MILLWORK

#### A. General

- 1. Materials and workmanship shall conform to the Quality Standards of the Architectural Woodwork Institute specified herein and to the drawings.
- 2. Cabinet work and millwork shall be performed by experienced cabinet work and millwork company, having craftsmen skilled in their trade.
- 3. Fabricate all cabinet work and millwork completely in the shop, in complete and/or as large units as practical, leaving only fitting, assembly, installation and a minimum of fabrication and finishing to be done at the building. Assembled work shall be rigidly secured and permanently fastened together with concealed fasteners.
- 4. Afford Commissioner every facility for inspection of work at shop or mill at such times as the Commissioner may select.
- 5. As far as practicable, use concealed fastenings for joining and assembling the work. Where this is impossible, the means of securing shall be placed in inconspicuous places and methods of joining and assembling submitted for Commissioner's approval prior to fabrication.
- 6. Mill all finish wood accurately to detail, with clean cut moldings, profiles and lines, machined, sanded smooth, housed, jointed, blocked, put together in the best manner, with provision for swelling and shrinkage, and to assure the work remaining in place without warping, splitting or opening of joints.

7. Cut trim to dimensions and profiles shown, from solid stock.
  8. Make all trim and the like in single lengths wherever possible; joints mitered, glued and splined. Continuous members shall have tight flush joints, doweled or splined and glued.
  9. Make all joints hairline tight, fitted accurately and joined with hardwood splines or dowels, glued together, or by other method approved by Commissioner. Use screws, not nails, for fastenings.
  10. Gluing shall, where practicable, be by the hot plate press method and glued surfaces shall be in close contact throughout. Glue stains on finished work will not be permitted.
  11. Cover surface fastenings, where permitted, with matching wood plugs or wood putty. Finish exposed edges of plywood with matching solid stock. Lock miter external corners; tongue and groove internal corners to allow for contraction and expansion.
  12. Machine sand with grain, finish with hand sanding, leave exposed surfaces free from machine or tool marks that will show through the finish.
  13. Work which adjoins drywall, concrete, or other finish shall be fitted and scribed in a careful manner and ample allowance shall be given for cutting and scribing.
  14. Erect work true to lines, levels and dimensions, square, aligned and plumb, securely and rigidly fastened in place.
- B. Cabinet Work: Provide all items of cabinet work indicated on drawings and as herein specified.
1. Tops, sides, backs, bottoms, dividers, shelves, fronts, doors and drawer fronts shall be of plywood core, with the specified wood veneer or plastic laminate as indicated on drawings.
  2. Drawer sides and backs shall be 1/2" thick solid clear selected white birch, suitable for clear finish. Drawer bottom shall be 3/8" thick plywood with clear selected white birch veneers, suitable for clear finish.
  3. Cabinet doors and drawers shall be mounted as indicated on drawings.
  4. Adjustable shelves in cabinets shall have grommets spaced 2" o.c. Assume two shelves per wall cabinets, one per base cabinet, unless otherwise noted.
  5. Fixed shelves shall be dadoed into side supports and glued.
  6. Shelves shall be 3/4" thick for spans up to 30"; for spans in excess of 30" to 48" shelves shall be 1" thick.
  7. All cabinets shall have closed top, sides, bottom, and back with veneers to match face work. Cabinets to fit accurately into indicated locations; scribe moldings permitted only where indicated.
  8. Countertops, counters, counter fronts, shelves, etc., indicated on drawings to have plastic laminate, shall have plastic laminate shop applied to 3/4" thick core, with plastic laminate backing sheet on underside or back of countertops, counters and

shelves. Plastic laminate shall be pressure laminated to core with laminate at external corners. Provide concealed wood framing to support plastic laminate counters, securely fastened to wall and to underside of counters.

### 3.11 WOOD BASES

- A. Provide plywood backing, toggle bolted to substrate, if substrate not suitable for securing wood base.
- B. Machine wood bases from specified wood, to profiles indicated on drawings.
- C. Set base level and plumb. Where indicated on drawings, face of wood base shall be flush with wall above. Glue wood base to substrate or to plywood backing, and screw or nail wood base to substrate or to plywood backing with countersunk wood screws or with finishing nails, recess wood screw heads, and spackle with wood putty, set and spackle nails with wood putty. Do not nail or fasten wood base to floor. Ends of wood base shall be either splined or ship lapped.
- D. Where no wood backing occurs, screw apply base at each stud with screw countersunk and wood putty applied and sanded smooth and flush with base.

### 3.12 WOOD DOOR FLUSH FRAMES

- A. Where indicated on drawings, provide wood frames for wood doors. Frames shall be braced, set straight and plumb and have anchors for building into adjoining construction; space anchors not over two (2) feet apart (one foot from corners). Machine wood frames from specified solid wood to profiles indicated on drawings. Set frames plumb, level, square; securely attached to adjoining construction. Wood frames, bucks and trim shall conform to details.

### 3.13 PAINTING AND FINISHING

- A. General: All painting and finishing work of this Section shall be shop applied, unless otherwise noted, as specified below. All painting and finishing shall match approved samples. Field finish painting, where specified below, shall be by painting Subcontractor, as specified for in Painting Section.
- B. Schedule of Painting and Finishing
  - 1. Shop Primer On:
    - a. Wood bases.
    - b. Wood trim and moldings to be field finish painted.
    - c. Ferrous metal work.
  - 2. Shop Natural Finish On:
    - a. Wood paneling.
    - b. Wood cabinets with wood veneers.
- C. Back-Painting: All work of this Section in contact with concrete or masonry or other moisture areas and all concealed surfaces of cabinet and millwork, shall be back-painted with one (1) coat of oil based paint prior to installation, shop applied where practicable.

- D. Field Touch-Up: Field touch-up shall be the responsibility of the installing Subcontractor, and shall include the filling and touch-up of exposed job made nail or screw holes, refinishing of raw surfaces resulting from job fitting, repair of job inflicted scratches and mars, and final cleaning up of the finished surfaces.

3.14 CLEAN UP AND PROTECTION

- A. Clean Up: At regular intervals during the course of the work, all debris and excess material shall be cleaned up and removed from the site. Upon completion of installation, clean all spaces of debris caused by woodwork installation.
- B. Protection: Protect all woodwork from marring, defacement of other damage until final completion and acceptance of the project by the Commissioner. Repair or replace all defective units prior to final inspection as directed by the Commissioner. Any units that cannot be satisfactorily repaired in the opinion of the Commissioner shall be replaced with new units of same original design, at no additional cost to the City of New York.

END OF SECTION

## SECTION 07 13 26

## SHEET MEMBRANE WATERPROOFING

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the sheet membrane waterproofing as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:
  - 1. Sheet membrane waterproofing, for foundation wall surfaces.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Concrete - Section 03 30 00.
- C. Earthwork - Section 31 20 00.

## 1.4 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Building Requirements. LEED Building submittals shall include the following, as applicable:

- 1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.

- c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Shop Drawings: Typical installation details, showing details at flashings, at terminations, at joints, at intersection of horizontal and vertical surfaces, and at penetrations in membrane system.
- C. Samples - Submit
1. Membrane, 6" x 6" samples of each membrane.
  2. 6" x 6" sample of flashing.
  3. 6" x 6" sample of drainage board.
- D. Manufacturer's literature: Submit manufacturer's technical, safety data sheets, and installation literature for all materials of this Section. Submit Independent Test data indicating that membrane meets properties specified herein.
- E. General Contractor's Certification: Submit per Article 1.9.C.
- 1.5 LEED PERFORMANCE CRITERIA
- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.

- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.6 STORAGE OF MATERIALS

- A. All materials shall be stored in their original tightly sealed containers or unopened packages; shall be clearly labeled with the manufacturer's name, brand name and number, and batch number of the material with expiration date where appropriate.
- B. Materials shall be stored in a neat and safe manner so as not to exceed the allowable live load of the storage area.
- C. Material shall be stored out of the weather in a clean, dry area.
- D. Liquid materials, such as adhesives, thinners and primers, shall be stored in areas away from sparks, open flames and excessive heat.

#### 1.7 JOB CONDITIONS

- A. No application of liquid applied urethane flashing shall commence or proceed during inclement weather, or the threat of imminent precipitation.
- B. All surfaces to receive the system shall be thoroughly dry and free of dew or frost.
- C. Application temperatures are not limited except that materials shall be stored until time of mixing at temperatures above 60 deg. F. to maintain a consistency suitable for mixing. Do no work below 40 deg. F.
- D. Prior to and during application, all dirt and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air, or similar methods.
- E. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

#### 1.8 WARRANTY

- A. **Manufacturer's Warranty:** Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period. Warranty period shall be three years from date of Substantial Completion.
- B. **Installer's Special Warranty:** Specified for, signed by Installer, covering work of this Section, for warranty period of two years from date of Substantial Completion. Warranty includes repair and/or replacement, at no additional cost to the City of New York, of all other work which may be damaged as a result of such defective work, and which becomes defective during the warranty period.



## 1.9 QUALITY ASSURANCE

- A. Preinstallation Conference: Approximately 2 weeks prior to scheduled commencement of waterproofing installation, meet at Project site with Waterproofing Installer; preparer of substrate to receive waterproofing; installers of other work in and around waterproofing that must precede, follow, or penetrate waterproofing (including Mechanical and Electrical Installers as applicable); Commissioner; City of New York; and waterproofing manufacturer's representative to review materials, procedures, schedules, and other requirements and conditions related to installing waterproofing.
- B. Manufacturer: The manufacturer providing the material or equipment specified in this Section must, for the past three years, have been regularly engaged in the manufacture of material or equipment similar in type to that required for this Project. Such similar material or equipment provided by the manufacturer must have been in satisfactory service for not less than three years.
- C. Installer: The contractor or subcontractor performing the work of this Section must, within the last three consecutive years prior to the bid opening, have successfully completed in a timely fashion projects similar in scope and type to the required work.

## 1.10 PROTECTION

- A. Against Loads: Protect work of this Section against concentrated loads and any other loads or equipment that would damage the materials or work.
- B. Against Traffic: Do not permit traffic on horizontally installed work of this Section, except for workmen doing the work, during the installation, and after the installation until membrane systems are covered with protective boards or with the specified finishing materials.
- C. Against Damage: Protect vertically installed work of this section from damage by reinforcing and placement.
  - 1. Take and maintain necessary preventative measures to protect work of this Section from damage until Project is accepted.
  - 2. Rejection of Damaged Work
    - a. Damaged materials or work will be rejected.
    - b. Rejected materials or work must be immediately removed and replaced with new materials.

## 1.11 FIELD QUALITY CONTROL

- A. Construction Traffic:
  - 1. Limit construction traffic over completed membrane.
  - 2. General Contractor shall provide 1/2 inch plywood protection layer, where construction traffic is unavoidable.
- B. Inform Commissioner in writing on a daily basis of any of the following events. State specific location of each occurrence.
  - 1. Buckling to the Waterproofing and other deformations as a result of ground water events.

2. Leakage through the finished waterproofing installation.
  3. Damage by other trades.
- C. Provide Manufacturer's Representative's report (prior to backfill) stating that the waterproofing has been inspected and is acceptable.

## PART 2 PRODUCTS

### 2.1 WATERPROOFING MEMBRANE

- A. Manufacturers: Subject to compliance with requirements, provide products manufactured by one of the following, or approved equal:
1. W. R. Grace Co.
  2. Carlisle.
  3. Polyguard Products, Inc.
- B. Basis for Project Design: Product names, numbers and other designations are those of W.R. Grace, used to set a design standard only.
- C. For foundation walls, provide "Bituthene 4000" sheet waterproofing membrane, 60 mils thick, and "Bituthene Liquid Membrane," 60 mils thick, for flashing, as manufactured by W. R. Grace or equal by Carlisle, Polyguard Products, Inc., or approved equal.
- D. Bituthene Surface Conditioner: Latex/water based primer specifically formulated to provide adhesion of Bituthene Waterproofing Membranes.
- E. Bituthene Elastomeric Mastic: Rubberized asphalt base mastic.
- F. Bitustik Tape: Double sided synthetic adhesive tape.
- G. Protection Board: 1/4" thick semi-rigid protection board, Bituthene Asphaltic Hardboard.
- H. Bituthene Liquid Membrane: Two-component 100% solids trowel grade asphalt modified urethane.
- I. Hydroduct 220 Drainage Board/Composite: Prefabricated dimpled polystyrene drainage core with a non-woven filter fabric on one side and a polymer film on the reverse side.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where membrane waterproofing is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 PREPARATION OF SURFACES TO RECEIVE WATERPROOFING

- A. Conform to the requirements of Bituthene Techletter No. BTL 82-02, published by W. R. Grace.

### 3.3 INSTALLATION

- A. General: Conform to recommendations and published specifications of the manufacturer' including environmental requirements.

- B. Foundation Walls (Accessible Walls)

1. General: The membrane, when in place must withstand a minimum static ground water pressure of 150 feet.
2. Priming: Application of primer shall be limited to what can be covered with Bituthene Waterproofing Membrane in a given work day. Primed areas not covered by membrane during the work day will be reprimed. Apply primer by spray, roller or brush at a rate of 250 - 350 sq. ft. per gallon. Roller shall be natural material such as lamb's wool, having a nap of approximately one inch. Primer shall be applied to a clean, dry, frost-free and dust-free surface. Sufficient primer must be used on the day surface to condition it to a dust-free state suitable for the application of Bituthene Waterproofing Membranes.
  - a. Bituthene Surface Conditioner should not be applied below 40 deg. F. on vertical surfaces. Allow primer to dry 30 minutes.
3. Membrane Installation: Apply Bituthene Waterproofing Membrane vertically in sections of 8' in length or less. On higher walls apply two or more sections with the upper overlapping the lower by a least 2-1/2". Press all membrane in place with heavy hand pressure or rollers during application.
4. Sealing Edges: Bituthene Waterproofing Membrane shall be applied over the edge of the slab or over the top of the foundation or parapet wall. If the membranes are terminated on the vertical surface, a reglet or counter flashing may be used or the membrane may be terminated directly on the vertical surface by pressing very firmly to the wall. Press edges with a metal or hardwood tool such as a hammer or knife handle. Apply a troweled bead of Bituthene Mastic to all vertical and horizontal terminations. Bituthene Liquid Membrane can be used as an alternative method at the General Contractor's option.
5. Sealing Seams: All edges and end seams must be overlapped at least 2-1/2". Apply succeeding sheets with a minimum 2-1/2" overlap and stagger end laps. Roll or press the entire membrane firmly and completely as soon as possible. Patch misaligned or inadequately lapped seams with Bituthene Membrane. Slit any fish mouths, overlap the flaps, and repair with a patch of Bituthene and press or roll in place. The edges of the patch shall be sealed with a troweling of mastic. Laps within 12" of all corners shall be sealed with a troweling of mastic.
6. Corner Forming: Outside corners must be free of sharp edges. Inside corners shall receive a fillet formed with Liquid Membrane, latex modified cement mortar equal to Daraweld C made by Grace mixed with cement mortar or epoxy mortar. Do not use fiber or wood cants. One of two methods may be used for treating corners at the General Contractor's option:

- a. Apply Bituthene Liquid Membrane 6" in each direction from the corner and form a fillet with a minimum 3/4" face.
  - b. Install an 11" minimum strip of Bituthene Membrane centered on the corner. Install Bituthene Membrane over the treated inside and outside corners.
7. Over waterproofing, apply drainage composite board by adhering board to cured membrane using tape or adhesive per manufacturer's recommendations.

3.4 CLEAN-UP

- A. Upon completion of the waterproofing system, the General Contractor shall remove all equipment, material and debris from the work and storage area, and leave those areas in an undamaged and acceptable condition.

END OF SECTION

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SECTION 07 21 00  
THERMAL INSULATION

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the thermal insulation as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Rigid foundation insulation.
  - 2. Mineral Fiber Insulation in exterior envelope as noted.
  - 3. Blanket insulation.
  - 4. Aerogel insulation.
  - 5. Attachment devices.
- B. Note that Concrete Masonry Wall thermal insulation is integral to the CMU, and is covered under Section 04 20 00.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Masonry - Section 04 20 00.
- C. Roof insulation - Section 07 52 00.
- D. Firestops and Smoke seals - Section 07 84 13.
- E. Acoustical insulation - Section 09 26 00.
- F. Earthwork - Section 31 20 00.

## 1.4 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 013300: Submittals LEED Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Submit product data for each type of product indicated, including re-cycled content.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.

## 1.5 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## 1.6 QUALITY ASSURANCE

- A. Fiberglass insulation shall contain a minimum of 20% (by weight) recycled content, calculated by adding the post-consumer recycled content percentage to one-half of the post-industrial recycled content percentage.
- B. Mineral wool insulation shall contain a minimum of 75% (by weight) recycled content, calculated by adding the post-consumer recycled content percentage to one-half of the post-industrial recycled content percentage.
- C. Extruded polystyrene insulation shall contain a minimum of 5% (by weight) recycled content, calculated by adding the post-consumer recycled content percentage to one-half of the post-industrial recycled content percentage.
- D. To the greatest extent possible, the Contractor shall use extruded polystyrene insulation products that do not utilize chlorine based gases in the production process.

## 1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type and brand. Delivered materials shall be identical to approved samples.
- B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged or otherwise not suitable for installation and replace with acceptable materials.
- C. Take every precaution to prevent the insulation from becoming wet, cover with tarps or other weather/watertight sheet goods.

## PART 2 PRODUCTS

### 2.1 RIGID INSULATION

- A. Slab-on-Grade Perimeter Insulation: Provide extruded polystyrene board, high-compressive-strength insulation equal to "Styrofoam Highload 60" manufactured by Dow Chemical Co., or equivalent product made by Owens Corning, PACTIV Building Products, or approved equal, conforming to ASTM C 578, Type VII, with a maximum flame spread and smoke developed indices of 15 and 165 respectively.



1. Insulation shall have an aged R value of not less than 5.0/inch; shall be 3" thick unless otherwise noted on the drawings
- B. Rigid Insulation For CMU Back-Up Wall – Exterior Face of Perimeter Wall: Provide foil-faced, polyisocyanurate board insulation equal to "Thermax Sheathing," manufactured by Dow Chemical Co. or approved equal conforming to ASTM C 1289, Type I, Class 2, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, based on tests performed on unfaced core on thicknesses up to 4 inches, and minimum compressive strength of 25 psi.

1. Boards shall be nominal 1.0" thick unless otherwise noted on the drawings.
2. Insulation shall have an aged R value of not less than 6.5/inch.

2.2 MINERAL FIBER BOARD INSULATION

- A. Mineral fiber board insulation shall be "Top Rock DD" made by Roxul Inc. or approved equal by Owens Corning or Thermafiber conforming to the following:

- |    |                    |  |                               |
|----|--------------------|--|-------------------------------|
| 1. | ASTM C 726         | Mineral Fiber Block and Board Thermal Insulation | Type 4B, Complies             |
| 2. | ASTM E 108         | Class A  |                               |
| 3. | ASTM C 356         | Linear Shrinkage                                 | .01% @350 deg. F (177 deg. C) |
| 4. | ASTM C 209         | Moisture Absorption                              | <1%                           |
| 5. | ASTM C 1104        | Water Vapor Sorption                             | 0.03%                         |
| 6. | ASTM E 96          | Water Vapor Transmission                         | >1716 ng/Pa.s.m <sup>2</sup>  |
| 7. | ASTM C 518 (C 177) | R-value/inch @75 deg. F.                         | 3.7hr.ft <sup>2</sup> F/Btu   |

2.3 BLANKET INSULATION

- A. Provide flexible glass fiber blankets/batts equal to "Fiberglass Flame Spread 25 Insulation" by Owens Corning or equal by Manville, Certainteed or approved equal conforming to ASTM C 612, Type 1A or ASTM C 665, Type III, Class A, faced on one side with foil reinforced Kraft vapor retarder; maximum flame spread and smoke developed indices 25 and 50 respectively.
- B. Insulation shall have an R value of not less than 3.7/inch and shall be 3" thick unless otherwise noted on the drawings.

2.4 AEROGEL THERMAL WRAP INSULATION

- A. Provide aerogel thermal wrap insulation equal to Thermablok by Thermablok Inc. or equal by Cabot Corp. or Aspen Aerogels conforming to the following:
1. Thickness as indicated on drawings. with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
  2. Minimum density of 9.4 lb/cu. ft.
  3. Thermal resistivity of 10.3 deg F x h x sq. ft./Btu x in. at 75 deg F.

## 2.5 ACCESSORIES

- A. Clips for Securing Insulation to Encountered Surfaces: Spindle anchor and washer type consisting of perforated metal plates with spindle welded to center and snap on washers. Spindle and washers shall receive a corrosion-resistant electro-zinc plating. Adhesives for securing clips in place shall be recommended by the approved clip manufacturer.
  - 1. Acceptable Manufacturers
    - a. Miracle Adhesives Corp.
    - b. Stic-Klip Mfg. Co., Inc.
    - c. Midwest Fasteners
    - d. or approved equal
- B. Adhesive for Bonding Insulation: The type recommended by the insulation manufacturer, and complying with fire-resistance requirements.
  - 1. For bonding rigid polystyrene insulation to masonry or concrete, provide adhesive equal to "Foamgrab PS" by Dacor Products Co. or equal made by ChemRex Inc., Miracle Adhesives, or approved equal.
- C. Protection Board: Premolded, semi-rigid asphalt/fiber composition board, 1/4" thick, formed under heat and pressure, standard sizes.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where thermal insulation is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 INSTALLATION

- A. General
  - 1. Cooperate in the coordination and scheduling of the work of this section with the work of other sections so as not to delay job progress.
  - 2. Install insulation in as large components as practical and to cover entire areas indicated on the drawings, closely butted together at sides and ends, and against walls, beams, etc. Neatly fit and cut insulation around all projections such as pipes, conduits, hangers and all other elements encountered in the field, which will result in complete coverage of the scheduled areas.
  - 3. Discard, off the site, insulation which becomes damaged during the course of installation, or is no longer in a physical condition to function for use intended, and replace with new material.

4. Clean surfaces on which adhesives are used to secure the insulation in place of dirt, grime, grease, oil and other foreign materials, to assure that the surfaces are properly prepared to accept the bond of the approved adhesives.
5. Exercise extreme care to avoid damage and soiling of faces on insulation units which will be exposed to view. Align joints accurately, with adjoining surfaces set flush.
6. Set vapor barrier faced units with vapor barrier to inside of construction, except as otherwise shown. Do not obstruct ventilation spaces. All joints in vapor barriers shall be sealed with 4" wide, foil faced duct tape to prevent vapor and air migration.
7. Tape joints and ruptures in vapor barriers, using tape specified above, and seal each continuous area of insulation to surrounding construction so as to ensure vapor tight installation of the units.
8. Where insulation is impaled on stick clips, provide clips not less than 3" from corners or edges and not more than 12" o.c.
9. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.
10. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.
11. Apply a single layer of insulation to the required thickness, unless a double layer is required, to make up the total thickness shown.
12. Furnish mason trades rigid insulation to be installed within masonry cavity.

### 3.3 INSTALLATION OF UNDERSLAB INSULATION

- A. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
- B. Protect top surface of horizontal insulation (from damage during concrete work) by application of protection board.

### 3.4 INSTALLATION OF BLANKET OR BATT FIBERGLASS INSULATION

- A. Install blanket fiberglass insulation in largest pieces as practical with edges closely butted. Cut and fit insulation to closely fit intersecting or penetrating surfaces.
  1. Face vapor barrier towards warm side, tape joints with 4" wide vaporproof aluminum tape applied over vapor barrier.

### 3.5 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

## SECTION 07 27 13

## MODIFIED BITUMINOUS SHEET AIR BARRIER

## PART 1 – GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to locate, furnish, deliver, install and maintain all landscaping work as shown on the Drawings and as specified herein, including but not limited to the following:
  - 1. Self-adhering, vapor-retarding, modified bituminous sheet air barriers.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Rough Carpentry – Section 06 10 00.
- F. Siding – Section 07 46 00.
- G. Flashing – Section 07 62 00.
- H. Roofing – 07 52 00.
- I. Glazed Aluminum Curtain Walls – 08 44 13.
- J. Aluminum Windows – 08 51 00.
- K. Skylight – 08 63 10.

## 1.4 DEFINITIONS

- A. Air Barrier Assembly: The collection of air barrier materials and auxiliary materials

applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

## 1.5 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous vapor-retarding air barrier. Air barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

## 1.6 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.

- B. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of air barrier.
- C. Shop Drawings: Submit detailed shop drawings showing locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strip, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
  - 1. Include details of interfaces with other materials that form part of air barrier.
- D. Product Certificates: For air barriers, certifying compatibility of air barrier and accessory materials with Project materials that connect to or that come in contact with air barrier; signed by product manufacturer.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for air barriers.

#### 1.7 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 0181113.13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 01 33 29.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.8 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm experienced in applying air barrier materials similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance and who is an ABAA-licensed contractor.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air barrier manufacturer.
- B. Protect stored materials from direct sunlight.

#### 1.10 PROJECT CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air barrier manufacturer. Protect substrates from environmental conditions that affect performance of air barrier. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

## PART 2 - PRODUCTS

### 2.1 SELF-ADHERING SHEET AIR BARRIER

- A. Modified Bituminous Sheet: 40 mil thick, self-adhering sheet consisting of 36 mils of rubberized asphalt laminated to a 4-mil thick, polyethylene film with release liner on adhesive side and formulated for application with primer that complies with VOC limits of authorities having jurisdiction.
  - 1. Products: Subject to compliance with requirements, provide Blueskin SA, by Henry Company, or approved equal from one of the following:
    - a. Carlisle Coatings & Waterproofing.
    - b. Grace, W. R. & Co.
    - c. Meadows, W. R., Inc.
  - 2. Physical and Performance Properties:
    - a. Membrane Air Permeance: Not to exceed 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
    - b. Tensile Strength: 250 psi minimum; ASTM D 412, Die C, modified.
    - c. Ultimate Elongation: 200 percent minimum; ASTM D 412, Die C, modified.
    - d. Low-Temperature Flexibility: Pass at minus 20 deg F; ASTM D 1970.
    - e. Crack Cycling: Unaffected after 100 cycles of 1/8-inch movement; ASTM C 836.
    - f. Puncture Resistance: 40 lbf minimum; ASTM E 154.
    - g. Water Absorption: 0.15 percent weight-gain maximum after 48-hour immersion at 70 deg F; ASTM D 570.
    - h. Vapor Permeance: 0.05 perms; ASTM E 96, Water Method.

### 2.2 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by air barrier manufacturer for intended use and compatible with air barrier. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid waterborne primer recommended for substrate by manufacturer of air barrier material.
- C. Counterflashing Strip: Modified bituminous 40-mil thick, self-adhering sheet consisting of 32 mils of rubberized asphalt laminated to an 8-mil thick, crosslaminated polyethylene film with release liner backing.
- D. Modified Bituminous Strip: Vapor-retarding, 40-mil thick, smooth-surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil thick polyethylene film with release liner backing.
- E. Termination Mastic: Cold fluid-applied elastomeric liquid; trowel grade.
- F. Substrate Patching Membrane: Manufacturer's standard trowel-grade substrate filler.

- G. Adhesive and Tape: Air barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- H. Modified Bituminous Transition Strip: Vapor-retarding, 40-mil thick, smooth-surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil thick polyethylene film with release liner backing.
- I. Elastomeric Flashing Sheet: ASTM D 2000, 2BC415 to 3BC620, minimum 50- to 65-mil thick, cured sheet neoprene with manufacturer's recommended contact adhesives and lap sealant with stainless-steel termination bars and fasteners.
- J. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low-modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Division 07 Section "Joint Sealants."

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
  - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
  - 2. Verify that concrete has cured and aged for minimum time period recommended by air barrier manufacturer.
  - 3. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
  - 4. Verify that masonry joints are flush and completely filled with mortar.
  - 5. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
  - 1. Install modified bituminous strips and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch.



- G. Bridge and cover isolation joints, expansion joints, and discontinuous deck-to-wall and deck-to-deck joints with overlapping modified bituminous strips.
- H. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- I. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

### 3.3 INSTALLATION

- A. Install modified bituminous sheets according to air barrier manufacturer's written instructions and according to recommendations in ASTM D 6135.
  - 1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous air barrier sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F.
- B. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.
  - 1. Install modified bituminous strips centered over vertical inside corners. Install 3/4-inch fillets of termination mastic on horizontal inside corners.
- C. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations with termination mastic and according to ASTM D 6135.
- D. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by air barrier sheet in same day. Reprime areas exposed for more than 24 hours.
  - 1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- E. Apply and firmly adhere modified bituminous sheets horizontally over area to receive air barrier sheets. Accurately align sheets and maintain a uniform 2-1/2-inch minimum lap widths and end laps. Overlap and seal seams and stagger end laps to ensure airtight installation.
  - 1. Apply sheets in a shingled manner to shed water without interception by any exposed sheet edges.
  - 2. Roll sheets firmly to enhance adhesion to substrate.
- F. Apply continuous modified bituminous sheets over modified bituminous strips bridging substrate cracks, construction, and contraction joints.
- G. Seal top of through-wall flashings to air barrier sheet with an additional 6-inch wide, modified bituminous strip.
- H. Seal exposed edges of sheets at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

- I. Install air barrier sheets and auxiliary materials to form a seal with adjacent construction and to maintain a continuous air barrier.
  - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
  - 2. Install butyl or modified bituminous strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over both substrates.
- J. Connect and seal exterior wall air barrier membrane continuously to roofing membrane air barrier, concrete below-grade structures, floor-to floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings using accessory materials as indicated and according to manufacturer's tested assembly.
- K. Wall Openings: Prime concealed perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip or flashing sheet so that a minimum of 3 inches of coverage is achieved over both substrates. Maintain 3 inches of full contact over firm bearing to perimeter frames with not less than 1 inch of full contact.
  - 1. Modified Bituminous Transition Strip: Roll firmly to enhance adhesion.
  - 2. Elastomeric Flashing Sheet: Apply adhesive to wall, frame, and flashing sheet. Install flashing sheet and termination bars, fastened at 6 inches o.c. Apply lap sealant over exposed edges and on cavity side of flashing sheet.
  - 3. Preformed Silicone-Sealant Extrusion: Set in full bed of silicone sealant applied to walls, frame, and membrane.
- L. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, doors, and miscellaneous penetrations of air barrier membrane with foam sealant.
- M. At end or each working day, seal top edge of membrane to substrate with termination mastic.
- N. Apply joint sealants forming part of air barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- O. Repair punctures, voids, and deficient lapped seams in air barrier. Slit and flatten fishmouths and blisters. Patch with air barrier sheet extending 6 inches beyond repaired areas in all directions.
- P. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air barrier components.

### 3.4 CLEANING AND PROTECTION

- A. Protect air barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
  - 1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. Remove and replace air barrier exposed to these conditions for more than 30 days.
  - 2. Protect air barrier from contact with creosote, uncured coal-tar products, TPO, EPDM, flexible PVC membranes, and sealants not approved by air barrier

manufacturer.

- B. Clean spills, stains, and soiling from adjacent construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

## SECTION 07 46 00

## SIDING

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the exterior siding as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Aluminum corrugated panels.
  - 2. Fiber cement panels.
  - 3. Miscellaneous aluminum trim.

## 1.3 RELATED SECTIONS

- A. Division 1 – DDC General Conditions.
- B. Carpentry- Section 06 20 00.
- C. Thermal Protection – Section 07 21 00.
- D. Flashing and Sheet Metal – Section 07 62 00.
- E. Joint Sealers – Section 07 90 00.

## 1.4 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies
- B. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- C. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- D. Samples: Submit samples for each type, color, texture and pattern required.
- E. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
1. Warranty Period (Aluminum Siding): 20 years (minimum) from date of Substantial Completion.

2. Warranty Period (Fiber Cement): 10 years (minimum) from date of Substantial Completion.

#### 1.5 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.6 QUALITY ASSURANCE

- A. Source Limitations for Siding: Obtain each type, color, texture, and pattern of siding, including related accessories, through one source from a single manufacturer.
- B. Mockup: Build 48 inch by 60 inch mockup of typical wall area, including an outside corner, to verify selections made under sample submittals and to demonstrate aesthetic effects.
- C. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials in a dry, well-ventilated, weathertight place and per manufacturer's instructions.

#### 1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with siding installation only if substrate is completely dry and if existing and forecasted weather conditions permit siding to be installed according to manufacturer's written instructions.

#### 1.9 SEQUENCING

- A. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.

#### 1.10 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Furnish full lengths of siding in a quantity equal to 2 percent of amount installed.

## PART 2 - PRODUCTS

### 2.1 ALUMINUM SIDING

- A. Aluminum Siding: Formed and anodized aluminum siding complying with AA-C22A41.
  - 1. Basis-of-Design Product: Centria, Econolap  $\frac{3}{4}$  inch or a comparable product by one of the following:
    - a. Alcoa Building Products, Inc.
    - b. Gentek Building Products, Inc.
    - c. Kaycan Ltd.
    - d. Norandex Inc./Reynolds Distribution Company.
    - e. Rollex Corporation.
- B. Type: Formed and smooth surface coil-coated aluminum, ASTM B209, 3003-H14 or 5052-H32 alloy.
- C. Panel Coverage: 34.66 inches, min.
- D. Panel Height: .75 inches, min.
- E. Corrugation Spacing: 2 inches, minimum.
- F. Minimum Nominal Thickness: .05" thick
- G. Finish: Manufacturer's standard Class I Clear Anodized Finish per AA-C22A41.
- H. Color: Clear.

### 2.2 FIBER CEMENT SIDING

- A. General: ASTM C 1186, Type A, Grade II, integrally-colored fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84.
  - 1. Basis-of-Design Product: Provide Natura TC by American Fiber Cement Corp./Eastern Architectural Products LLC or comparable product by one of the following:
    - a. Swisspearl 'Xpressive'
    - b. 'Carat'; by Eternit.
    - c. Natura Pro; by Europanels
    - d. Vectr by Taktyl.
  - 2. Description:
    - a. Panel Thickness: 5/16" thick;  $\frac{1}{4}$ " minimum.
    - b. Density: 103 lbs/cu. ft. (1650 kg/m<sup>3</sup>).
    - c. Max. Water Absorption: 20%.
    - d. Fire Performance: Non-combustable; ASTM E 94, Class A, NFPA 70.

- e. Finish: Smooth finish with transparent water-based acrylic dispersion on face; PVDC on back.
- f. Color: Anthracite (N 251) – from Basis of Design Product.

## 2.3 ALUMINUM FRAMING

### A. General: Provide

- 1. Z-Shaped Furring: 1-3/16" aluminum z strips, horizontally oriented, to secure mineral wool insulation (as part of rainscreen system) in place.
- 2. Hat-Shaped, Rigid Furring Channels: 1-3/16" aluminum channels, vertically oriented at each vertical joint.

## 2.4 ACCESSORIES

### A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.

- 1. Provide accessories made from same material as and matching color and texture of adjacent siding unless otherwise indicated.

### B. Decorative Accessories: Provide the following fiber-cement decorative accessories as indicated:

- 1. Door and window casings.
- 2. Entrance and window head pediments.
- 3. Moldings and trim.

### C. Colors for Decorative Accessories: Match adjacent siding.

### D. Flashing: Provide stainless steel flashing complying with Division 07 Section "Sheet Metal Flashing and Trim" at window and door heads and where indicated.

### E. Fasteners: Unless otherwise indicated, use manufacturer's recommended stainless-steel fasteners.

- 1. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch, or three screw-threads, into substrate.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.



### 3.3 INSTALLATION

- A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Ensure that furring is in place and free of burrs and obstructions that would prevent level and flush installation of parallel boards.
- C. Install aluminum panels and accessories according to AAMA 1402.
- D. Where framing of rainscreen system and components will contact dissimilar metals, isolate dissimilar metals by separating with rubber gaskets or elastomeric sealant. Use rubber washers where fasteners made from dissimilar metal penetrate siding. Isolate dissimilar metals behind siding by covering with polyethylene film.
- E. Install fiber-cement siding to framing components and back-up structure. Install fasteners no more than 24 inches o.c.
  - 1. Install related accessories in accordance with the manufacturers written instructions and as required for a complete installation.

### 3.4 ADJUSTING AND CLEANING

- A. Remove damaged, improperly installed, or otherwise defective siding materials and replace with new materials complying with specified requirements.
- B. Clean finished surfaces according to siding manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION

## SECTION 07 52 00

## MODIFIED BITUMEN ROOFING

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: heat island effect, roof; use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the modified bitumen roofing as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. SBS modified bitumen roof membrane.
  - 2. Roof insulation.
  - 3. SBS modified flashing.
  - 4. Accessories.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Wood blocking - Section 06 20 00.
- C. Flashing and sheet metal - Section 07 62 00.
- D. Roof drains - Division 22.

## 1.4 QUALITY ASSURANCE

- A. Manufacturer: The manufacturer providing the material or equipment specified in this Section must, for the past three years, have been regularly engaged in the manufacture of material or equipment similar in type to that required for this Project. Such similar material or equipment provided by the manufacturer must have been in satisfactory service for not less than three years.

- B. Experience Requirements for Installer: The contractor or subcontractor performing the work of this Section must, within the last three consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three projects similar in scope and type to the required work.
- C. Submit the following:
1. Letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.
  2. Letter from the primary roofing manufacturer stating that the proposed application will comply with the Manufacturer's requirements in order to qualify the project for the specified guarantee.
- D. Pre-Roofing Conference: Prior to installation of roofing and associated work, meet at project site, or other mutually agreed location, with Installer, roofing manufacturer, installers of related work, Contractor and other entities concerned with roofing performance, including the Commissioner and City of New York. Record discussions and agreements and furnish copy to each participant. Provide at least seventy-two (72) hours advance notice to participants prior to convening pre-roofing conference. Review methods and procedures related to roofing work, including but not limited to the following:
1. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by other trades.
  2. Review roofing system requirements (drawings, specifications and other Contract Documents).
  3. Review required submittals, both completed and yet to be completed.
  4. Review and finalize construction schedule related to roofing work and verify availability of materials, Installer's personnel, equipment and facilities needed to make progress and avoid delays.
  5. Review required inspection, testing, certifying and material usage accounting procedures.
  6. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not a mandatory requirement).
- E. UL Listing: Provide labeled materials which have been tested and listed by UL in "Building Materials Directory" for application indicated, with "Class A" rated materials/system for roof slopes shown.
1. Provide roof covering materials bearing Classification Marking (UL) on bundle, package or container indicating that materials have been produced under UL's Classification and follow-up Service.
- F. Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction:

1. Surface Burning Characteristics: ASTM E 84.
  2. Fire Resistance Rating: ASTM E 119.
  3. Combustibility Characteristics: ASTM E 136.
- G. Provide roofing system and component materials which have been evaluated by Factory Mutual System for fire spread, wind-uplift Class 90, and hail damage and are listed in "Factory Mutual Approval Guide" for Class I construction. System shall also meet ASCE-7 for wind uplift standards.
1. Provide roof covering materials bearing FM approval marking on bundle, package or container, indicating that material has been subjected to FM's examination and follow-up inspection service.

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).

4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit manufacturer's technical product data, installation instructions and recommendations for each type of roofing product required. Include data substantiating that materials comply with requirements.
1. For asphalt bitumen, provide label on each container or certification with each load of bulk bitumen, indicating flash point (FP), finished blowing temperature (FBT), softening point (SP) and equiviscous temperature (EVT).
- C. Samples: Submit for the following products:
1. Cap sheet, of color required.
  2. Flashing sheet, of color required.
  3. Aggregate surfacing material in gradation and color required.
  4. Walkway pads or rolls, of color required.
- D. Pre-Roofing Conference: Submit copies of pre-roofing conference records.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.
- D. Solar Reflectance Index: Not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

#### 1.7 JOB CONDITIONS

- A. Weather Condition Limitations: Proceed with roofing work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer's recommendations and warranty requirements.

#### 1.8 PRODUCT HANDLING

- A. Store and handle roofing sheets in a manner which will ensure that there is no possibility of significant moisture pick-up.

- B. Store in a dry, well ventilated, weather-tight place. Unless protected from weather or other moisture sources, do not leave unused felts on the roof overnight or when roofing work is not in progress. Store rolls of felt and other sheet materials on end on pallets or other raised surface. Handle and store materials or equipment in a manner to avoid significant or permanent deflection of deck.

#### 1.9 WARRANTY

- A. Special Project Warranty: Provide written warranty, signed by Manufacturer of primary roofing materials and his authorized Installer, agreeing to replace/repair defective materials and workmanship as required to maintain roofing system in watertight condition, warranty to include pitch pockets.
- B. Warranty period for manufacturer is twenty (20) years after date of Substantial Completion; no dollar limit.
- C. Warranty period for installer is two (2) years after date of Substantial Completion; no dollar limit.

### PART 2 PRODUCTS

#### 2.1 ROOFING SYSTEM

- A. Roofing system to be multiple layer, SBS modified bitumen (polyester reinforced), granule surfaced Siplast Paradiene 30 CR FR, with white synthetic chips.
- B. Base Sheet: ASTM D 4897, Type II, venting, nonperforated, heavyweight, asphalt-impregnated and -coated, glass-fiber base sheet with coarse granular surfacing or embossed venting channels on bottom surface
- C. Roofing Membrane Sheet: ASTM D 6164, Grade S, Type I or II, polyester reinforced, SBS-modified asphalt sheet; suitable for application in cold applied adhesive.
- D. Membrane Cap Sheet: ASTM D 6164, Grade S, Type I or II, polyester reinforced, SBS-modified asphalt sheet; granular surfaced, suitable for application in cold applied adhesive.
- E. Cold-Applied Adhesive: Roofing system manufacturer's standard asphalt based, one or two part, asbestos-free, cold applied adhesive that is compatible with roofing membrane and flashings.

#### 2.2 ROOF INSULATION

- A. Polyisocyanurate Board Roof Insulation: Rigid, sloped (1/4" per foot minimum) and flat, cellular thermal insulation with polyisocyanurate closed-cell foam core and manufacturer's standard facing laminated to both sides; complying with ASTM C 1289, average LTTR value as designated at mean temperatures indicated, after testing per ASTM C 1303 as follows:
  - 1. Surface Burning Characteristics: Maximum flame spread of 25.
  - 2. LTTR R-Value: 6.0/inch at 75 deg. F.
- B. Acceptable Product/Manufacturer: "Enrgy 3" by Johns Manville, or equal by Apache or GAF.

1. Roof membrane manufacturer must approve insulation in writing.

### 2.3 MODIFIED BITUMINOUS BASE FLASHING

- A. Provide modified bituminous base flashing system as determined by edge details and that is acceptable to roofing manufacturer.

### 2.4 CANT STRIPS

- A. Provide cant strips formed of rigid insulation matching roof insulation or molded asphalt or coal tar impregnated organic fiber insulation material, 45° cant, unless otherwise indicated.

### 2.5 MISCELLANEOUS MATERIALS

- A. Lead flashing sheet of 4 lb. flashing lead for pipe flashing of common desilverized pig lead; all other roof flashing shall be stainless steel.
- B. FM approved mechanical fasteners for attaching insulation to substrate.
- C. Roof Walkway: Preformed, skid-resistant boards consisting of modified asphalt, reinforcements and fillers with a ceramic granule surface on both sides. Dimension shall be 32" x 32" x 5/16". "DynaTred Roof Walkway" by Johns Manville or approved equal.
- D. Pitch Pockets: J.M. Chem-Curb system, consisting of a preformed structural urethane outer shell filled with a two-part sealant J.M. Flashing Cement by Johns Mansville, or equal system by GAF, Soprema or Siplast. A two-part sealant adhesive equal to J.M. Flashing Cement shall be used to bond the shell to the roof finished surface as well as seal the edges.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where modified bituminous roofing is to be installed for compliance with requirements. Report conditions detrimental to built-up roofing work. Proceed after unsatisfactory conditions are corrected to permit proper installation of the work.
- B. Clean substrate of dust, debris, and other substances detrimental to built-up roofing work. Remove sharp projections.

### 3.2 INSTALLATION, GENERAL

- A. Install built-up roofing in accordance with manufacturer's recommendations and requirements of authorities having jurisdiction.
- B. Substrate shall be clean, smooth and dry, free of projections which might puncture the felts.
- C. Insure that all drains, curbs, blocking and roof penetrating components are in place before any roofing work starts. See that all roof drains are set 1" below the normal finish roof level to insure that additional flashing around the drains will not be built-up above the normal roof level and prevent proper drainage.

- D. Install flashing, including counter flashing, as roof application progresses. If delay is unavoidable, trowel the top of the flashing with flashing cement close to the joint to prevent water from entering behind the flashing until the counter flashing is in place.
- E. Start roofing application at far points of the deck and work toward area where base materials are fastened to the roof deck (to minimize traffic over newly applied roofing).
- F. Weigh down all membrane edges left incomplete before splicing with other sections of membrane.
- G. Prohibit phased application in which saturated felts are left exposed overnight or longer before top plies and topcoat are applied. Place aggregate surface on same day as felts.
- H. Inspect roof drains for obstructions and debris after the roofing work is completed.

### 3.3 INSULATION

- A. Extend insulation and cover board full thickness over entire surface to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation and mastic.
- B. Apply a double layer of insulation of the required thickness, to make up the total thickness. Stagger joints between layers as recommended by the manufacturer.
- C. Set first layer of insulation using mechanical fasteners spaced in accordance with FM requirements to meet I-90 wind uplift. Apply second layer of insulation and cover board in cold-applied adhesive.
- D. Do not advance the laying of insulation ahead of roofing more than necessary for sequence of operations. Cover insulation exposed at end of each day's work (and when rain threatens) with waterproofing materials. Do not permit insulation to become wet. Remove and dispose of insulation which has become wet; replace before proceeding with roofing work.
- E. Lay with edges in moderate contact but do not force into place.
- F. Stagger end joints; or tape joints where recommended by the manufacturer.
- G. Install temporary water cut-offs at completion of each day's work and remove upon resumption of work.

### 3.4 ROOFING

- A. Install modified bituminous membrane sheets according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, adhering to substrate in cold applied adhesive.
- B. Shingling of Plies: Lay plied bituminous membranes over insulation and Perlite board with felts shingled uniformly to achieve the required plies in accordance with manufacturer's instructions.
- C. Set on Accessories: Where small roof accessories are set on built-up roofing membrane, set metal flanges in a bed of roofing cement, and seal penetration of membrane with bead of roofing cement.



- D. Walkway Cap Sheet Strips: Install roofing membrane walkway cap sheet strips over roofing membrane in cold-applied adhesive.

### 3.5 COMPOSITION FLASHING AND STRIPPING

- A. Provide composition flashing at cant strips and other sloping and vertical surfaces, and at roof edges, and at penetrations through roof. Nail or provide other forms of mechanical anchorage of composition flashing to vertical surfaces, as recommended by manufacturer of primary roofing materials. Except where concealed by elastic flashing, apply a heavy coating of roofing cement over composition flashing.

### 3.6 ROOF DRAINS

- A. Install 1-1/2" x 18" Tapered Edge Strips to form a gradually tapered sump transition from top of insulation to roof drain flange. Minimum sump size to be 4 ft. by 4 ft.
- B. Install roofing plies, starting at the low point (roof drain) in a shingle fashion so that four plies are provided, trimming felt plies at edge of drain flange.
- C. Install a 4# lead flashing (minimum size 30" x 30"), set in bed of flashing cement, on top of roofing plies. Form lead to shape of sump and into drain bowl, trimming neatly approx. 1" beyond ring. Install clamping ring immediately.
- D. Prime top surface of lead with asphalt primer. Allow to dry completely.
- E. Strip in lead with one ply of SBS Modified Bitumen membrane, extending from clamping ring out a minimum of 6" beyond lead.

END OF SECTION

## SECTION 07 62 00

## FLASHING AND SHEET METAL

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the sheet metal work, as indicated on the drawings and/or specified herein, including but not limited to, the following:
  - 1. Aluminum cap metal flashing.
  - 2. Stainless steel and aluminum through wall flashing.
  - 3. Field fabricating (including bending, cutting, soldering, etc.), if required, of stainless steel flashing.
  - 4. Stainless steel and aluminum flashing elsewhere, where metal flashing is indicated on drawings.
  - 5. Separation of contacting surfaces of dissimilar metals.
  - 6. Aluminum downspouts.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Unit masonry – Section 04 20 00.
- C. Roofing - Section 07 52 00.

## 1.4 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Shop Drawings: Submit, showing all materials, finishes, fastenings, joint details, fabrication, construction and relation to adjoining construction.
- C. Samples: Submit 12" x 12" samples of flashing materials and finishes.
- 1.5 LEED PERFORMANCE CRITERIA
- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.

- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.6 WARRANTY

- A. The Contractor shall warrant that all Metal Flashing Work executed under this Section will be free from defects in materials and workmanship for a period of two (2) years from date of acceptance of the Project, and he shall remedy any defects in the Metal Flashing Work.

#### 1.7 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary at no additional cost to the City of New York.

### PART 2 PRODUCTS

#### 2.1 STAINLESS STEEL MATERIALS

##### A. Stainless Steel Flashing Materials

1. Stainless Steel Flashing: ASTM A167, Type 304, stainless steel, with 2D finish, dead soft temper, fully annealed, as manufactured by International Nickel Co., Republic Steel Corp., United States Steel, Washington Steel Corp. or approved equal. Thickness of stainless steel shall be as listed below, unless otherwise indicated on the drawings:
    - a. Concealed Flashings: .012" thick, thirty (30) gauge (U.S. Standard).
    - b. Exposed Flashings: .015" thick, twenty eight (28) gauge (U.S. Standard).
    - c. Edge Strips: .025" thick, twenty four (24) gauge (U.S. Standard).
  2. Through wall flashing shall have sawtooth ribs at three (3) inch interval as manufactured by Keystone Flashing Co., or approved equal.
  3. Accessories and Fastenings: AISI, Types 302 and 304 stainless steel.
  4. Solder: Composed of sixty (60) percent block tin and forty (40) percent pig lead, except that solder at seams exposed to public view shall be eighty (80) percent tin and twenty (20) percent lead.
  5. Flux: An acid type flux manufactured specifically for soldering stainless steel, as approved.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type non-corrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

## 2.2 ALUMINUM MATERIALS

- A. Aluminum Sheet: ASTM B 209, Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:
1. Factory Prime Coating: Where painting after installation is indicated, provide pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat; with a minimum dry film thickness of 0.2 mil (0.005 mm).
  2. Siliconized-Polyester Coating: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil (0.005 mm) for primer and 0.8 mil (0.02 mm) for topcoat.
    - a. Color: As selected by Commissioner from manufacturer's full range.
  3. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    - a. Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2604.
      - 1). Color: As selected by Commissioner from manufacturer's full range.
  4. Anodized Finish: Apply the following coil-anodized finish:
    - a. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
  5. Finish on aluminum flashing shall match adjacent materials.

## 2.3 UNDERLAYMENT MATERIALS

- A. Polyethylene Sheet: 6-mil- (0.15-mm-) thick polyethylene sheet complying with ASTM D 4397.
- B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- C. Slip Sheet: Rosin-sized paper, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

## 2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.

2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
  3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
  4. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
- C. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer
- D. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- E. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

## 2.5 ALUMINUM DOWNSPOUTS

- A. Provide aluminum downspouts fabricated of formed aluminum, 0.050" thick, alloy 5005-H154, smooth, no pattern.
- B. Downspout shall be manufactured in 10'-0" lengths, rectangular closed-face with mitered elbows, factory offset on one end to provide for a 3/4" telescope joint. Downspout shall contain a factory mounted back, non-sealed to allow seepage of water in overflow conditions.
1. Elbows for downspouts shall be of welded construction, with matching finish applied after welding. Such finish shall be of quality equal to finish for non-welded parts. Grinding and spray painting of parts to match will not be permitted. Elbows shall be provided with a factory offset on its lower end to allow a 3/4" telescope joint.
  2. Provide manufacturer's standard wall brackets of compatible material to downspout with matching finish and color.
- C. Roof Mounted Splash Pans: Fabricate from 0.040-inch thick formed aluminum.
- D. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: Cleaned with inhibited chemicals; Chemical Finish: Acid-chromate-fluoride-phosphate conversion coating; Organic Coating: As specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions.
1. Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605-98.
  2. Custom color and gloss as selected by the Commissioner.
- E. Provide units manufactured by MM Systems, or equal made by Cheney, Hickman, or approved equal.

**PART 3 EXECUTION****3.1 INSPECTION**

- A. Examine the areas and conditions where sheet metal work is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

**3.2 METAL FLASHING INSTALLATION**

- A. Reference Standard: Conform to the requirements of 5<sup>th</sup> Edition of the Sheet Metal and Air Conditioning Contractors Association (SMACNA) Architectural Sheet Metal Manual.
- B. General: Fabricate and install metal flashing work in accordance with details and specifications of above Reference Standard, with manufacturer's instructions, and as herein specified, to provide a watertight installation. Apply metal flashing to smooth, even, sound, clean, dry surfaces free from defects. Make provisions to allow for expansion and contraction of metal flashing work. Wherever practicable, shop form all metal flashing work and deliver ready for installation. Form metal flashing work accurately to required profiles, with flat surfaces, straight edges and corners, free from defects. Fold exposed metal edges back not less than 1/2" and form drip.
- C. Metal Types: Stainless steel flashing should be used in all conditions where flashing will come in contact with concrete, masonry or mortar. Do not use aluminum flashing at these locations. In cases where aluminum is indicated on the drawings and will come in contact with concrete, masonry or mortar, please alert the Commissioner. If aluminum is to be used, it shall have a coating that will mitigate any corrosion from contact with the alkalis in these materials.
- D. Nailing: Confine to sheets twelve (12) inches or less in width. Confine nailing to one edge only, locate nails where concealed. Use No. 12 x 1" long flat headed, annular threaded, Type 302 stainless steel nails for nailing to wood blocking; use one (1) inch long masonry nails for nailing to concrete. Space nails four (4) inches o.c. maximum.
- E. Cleating: Use cleats where sheets are more than twelve (12) inches in width. Space cleats approximately twelve (12) inches o.c.. Cleats two (2) inches wide by three (3) inches long, of the same material and weight as the metal flashing being installed. Secure one end of the cleat with two (2) nails and fold edge back over the nail heads. Lock other end into seam or into folded edge of metal flashing sheets. Pre-tin cleats for soldered seams.
- F. Joining: Join metal flashings with one (1) inch locked and soldered seams except at slip joints. Mallet seams flat and solder full length of seam as specified below.
- G. Soldering: Clean and pre-tin edges of metal flashing to be soldered before soldering is begun with solder on both sides for a width of not less than 1-1/2". Solder slowly with well heated metal surfaces. Use ample solder. Show not less than one full inch of evenly flowed solder on seam. Seams shall have a liberal amount of flux brushed in before soldering is commenced. Where soldering paste or killed acid is employed as a flux, soldering shall follow immediately after application of the flux. Upon completion of soldering, clean surfaces of all flux.
- H. Slip Joints: Locate slip joints not more than twenty four (24) feet apart and not more than eight (8) feet from corners. Form slip joints as three (3) inch wide joints with cover piece behind flashing, and fill locked ends neatly with sealant.

- I. Cap Flashing: Install over base flashings, in eight (8) to ten (10) foot lengths, lapped six (6) inches at ends. Cap flashing shall be increased longitudinally to produce spring action to hold bottom edge of cap flashing firmly against base flashing. Cap flashing shall lap base flashing at least four (4) inches, with exposed bottom edge at a forty five (45) degree angle downward and folded back on underside at least 1/2" to form drip. Make cap flashing continuous at corners and angles.
- J. Miscellaneous Flashing: Provide all other miscellaneous metal flashing not specifically mentioned herein, but indicated on drawings and/or required to provide a watertight installation.
- K. Separation of Dissimilar Materials: Back paint surfaces of metal flashing in contact with dissimilar metals or with concrete or masonry with bituminous paint.
- L. Reglets
  - 1. Provide watertight reglets in masonry and concrete work to receive cap flashing. Form reglets of stainless steel using same thickness as stainless steel sheet metal specified.
  - 2. In masonry work use open or closed slot reglets with slot at least one (1) inch deep and 3/16" wide. Provide hook dams or turn-ups for anchoring securely into mortar joints. Insert cap flashing into slot full depth using button punch or lead wedges to lock in place.
  - 3. In concrete work, use open or closed slot reglets with slot sloped upward at forty five (45) degrees, at least one (1) inch deep and 3/16" wide. For fastening reglets to concrete forms use double-head stainless steel nails spaced twelve (12) inches apart maximum.
  - 4. Insert cap flashing full depth into reglet slot, and wedge in place using lead strips spaced on twelve (12) inch centers maximum or lead caulking rope. When lead strips are used for continuous caulked reglets, use approved weather-resistant fibrous compounds.
- M. Through-the-Wall Flashings: Provide through-the-wall flashings as shown. Form bonding features so as not to puddle water on surface. Lap cross joints to interlock design pattern at least three (3) inches. Stop typical flashings in mortar joint 1/2" from exterior face of wall.
- N. Downspouts
  - 1. Install downspouts with brackets 24" o.c.; attach brackets to structure, use non-corrosive screw anchors.
  - 2. Join sections with manufacturer's standard telescoping joints. Provide fasteners designed to hold downspouts securely 1" away from walls, locate fasteners at top and bottom and at approximately 60" o.c. in between.
- O. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in asphalt roofing cement or elastomeric sealant.
- P. Scupper: Continuously support scupper, set to correct elevation, and seam frames to interior wall face, over cants or tapered edge strips, and under roofing membrane, unless otherwise indicated on the drawings.



END OF SECTION

## SECTION 07 84 13

## FIRESTOPPING

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the firestops and smoke seals as shown on the drawings and/or specified herein, including, but not 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. Sealant joints in fire-resistance-rated construction.
  - 5. Construction joints, including those between top of fire rated walls and underside of floors above.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Cast-in-place concrete - Section 03 30 00.
- C. Unit masonry - Section 04 20 00.
- D. Joint sealers - Section 07 92 00.

- E. Gypsum Assemblies- Section 09 29 00.
- F. Piping penetrations - Division 22.
- G. Duct penetrations – Division 23.
- H. Cable and conduit penetrations - Division 26.

#### 1.4 REFERENCES

- A. ASTM E 814 "Standard Method of Fire Tests of Through-Penetration Firestops."
- B. UL 1479, UBC 7-5 (Both are same as A. above).
- C. ASTM E 119 "Standard Method of Fire Tests of Building Construction and Materials."
- D. UL 263, UBC 7-1 (Both are same as C. above).
- E. UL 2079 "Tests For Fire Resistance of Building Joint Systems."
- F. ASTM E 1399 "Test For Dynamic Movement Conditions."
- G. ASTM E 1966 (Same as E. above).
- H. Published Through-Penetration Systems by recognized independent testing agencies.
  - 1. UL Fire Resistance Directory, Volume II of current year.
  - 2. Warnock Hersey Certification Listings, current year.
  - 3. Omega Point Laboratories, current year.

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

- 1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.

- d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Submit manufacturer's product literature for each type of firestop material to be installed. Literature shall indicate product characteristics, typical uses, performance, limitation criteria, test data and indication that products comply with specified requirements.
- C. Submit shop drawings detailing materials, installation methods, and relationships to adjoining construction for each firestop system, and each kind of construction condition penetrated and kind of penetrating item. Include firestop design designation of qualified testing and inspection agency evidencing compliance with requirements for each condition indicated.
1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop configuration for construction and penetrating items.
- D. Material Safety Data Sheets: Submit MSDS for each firestop product.
- E. Submit qualifications of firestop installer, including letter from firestop manufacturer of products proposed to be installed, wherein manufacturer recognizes as trained installer for installation of that manufacturer's products.
- F. Manufacturer's Letters: For installations or configurations not covered by a UL or Warnock Hersey design number, a recommendation shall be obtained from the manufacturer, in writing, for the specific application.
- 1.6 LEED PERFORMANCE CRITERIA
- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.

- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 QUALITY ASSURANCE

- A. General: Provide firestopping systems that are produced and installed to resist the spread of fire, and the passage of smoke and other gases.
- B. Firestopping materials shall conform to Flame (F) and Temperature (T) ratings as required by local building code and as tested by nationally accepted test agencies per ASTM E 814 or UL 1479. The F rating must be a minimum of one (1) hour but not less than the fire resistance rating of the assembly being penetrated. T rating, when required by code authority, shall be based on measurement of the temperature rise on the penetrating item(s). The fire test shall be conducted with a minimum positive pressure differential of 0.01 inches of water column.
- C. Firestopping products shall be asbestos free and free of any PCBs.
- D. Do not use any product containing solvents or that requires hazardous waste disposal.
- E. Do not use firestop products which after curing, dissolve in water.
- F. Do not use firestop products that contain ceramic fibers.
- G. Firestopping Installer Qualifications: Firestop application shall be performed by a single firestopping contractor who specializes in the installation of firestop systems, whose personnel to be utilized have received specific training from the proposed respective firestop manufacturer, and firestop installer shall have a minimum of three years experience (under present company name) installing firestop systems of the type herein specified.
- H. Mock-Up: Prepare job site mock-ups of each typical Firestop System proposed for use in the project. Approved mock-ups will be left in place as part of the finished project and will constitute the quality standard for the remaining work.
- I. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
  - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
  - 2. For floor penetrations with annular spaces exceeding 4 inches or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means.
  - 3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

#### 1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original unopened containers with manufacturer's name, product identification, lot numbers, UL or Warnock Hersey labels, and mixing and installation instructions, as applicable.
- B. Store materials in the original, unopened containers or packages, and under conditions recommended by manufacturer.
- C. All firestop materials shall be installed prior to expiration of shelf life.

#### 1.9 PROJECT CONDITIONS

- A. Verify existing conditions and substrates before starting work
- B. Do not use materials that contain solvents, show sign of damage or are beyond their shelf life.
- C. During installation, provide masking and drop cloths as needed to prevent firestopping products from contaminating any adjacent surfaces.
- D. Conform to ventilation requirements if required by manufacturer's installation instructions or Material Safety Data Sheet.
- E. Weather Conditions: Do not proceed with installation of firestop products when temperatures are in excess or below the manufacturer's recommendations.
- F. Schedule installation of firestop products after completion of penetrating item installation but prior to covering or concealing of openings.
- G. Coordinate this work as required with work of other trades.

#### 1.10 SEQUENCING AND SCHEDULING

- A. Pre-Installation Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.
- B. Sequence: Perform work of this and other sections in proper sequence to prevent damage to the firestop systems and to ensure that their installation will occur prior to enclosing or concealing work.
- C. Install all firestop systems after voids and joints are prepared sufficiently to accept the applicable firestop system.
- D. Do not cover firestop systems until they have been properly inspected and accepted by the authority having jurisdiction.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with requirements, provide products of one of the following manufacturers:
  - 1. Tremco
  - 2. Bio-Fireshield
  - 3. 3M

4. Specified Technologies Inc.
5. U.S. Gypsum Co.
6. Nelson
7. Hilti, Inc.
8. Grace Flame Safe
9. or approved equal

## 2.2 FIRESTOPPING, GENERAL

- A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.
- B. Accessories: Provide components for each firestopping system that are needed to install fill materials. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include but are not limited to the following items:
  1. Permanent forming/damming/backing materials including the following:
    - a. Semirefractory fiber (mineral wool) insulation.
    - b. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
    - c. Fire-rated form board.
    - d. Joint fillers for joint sealants.
  2. Temporary forming materials.
  3. Substrate primers.
  4. Collars.
  5. Steel sleeves.
- C. Applications: Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.
- D. Smoke seals at top of partitions shall be flexible to allow for partition deflection.

## 2.3 FILL MATERIALS FOR THROUGH-PENETRATION FIRESTOP SYSTEMS

- A. Endothermic, Latex Compound Sealant: Single-component, endothermic, latex formulation.
- B. Intumescent, Latex Sealant: Single-component, Intumescent, latex formulation.
- C. Intumescent Putty: Non-hardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.

- D. Intumescent Wrap Strips: Single-component, elastomeric sheet with aluminum or polyethylene foil on one side.
- E. Job-Mixed Vinyl Compound: Prepackaged vinyl-based powder product for mixing with water at Project site to produce a paintable compound, passing ASTM E 136, with flame-spread and smoke-developed ratings of zero per ASTM E 84.
- F. Mortar: Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.
- G. Pillows/Bags: Re-usable, heat-expanding pillows/bags composed of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.
- H. Silicone Foam: Two-component, silicone-based liquid elastomer that, when mixed, expands and cures in place to produce a flexible, non-shrinking foam.
- I. Silicone Sealant: Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealant of grade indicated below:
  - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces and non-sag formulation for openings in vertical and other surfaces requiring a non-slumping/gunnable sealant, unless firestop system limits use to non-sag grade for both opening conditions.

#### 2.4 FIRE-RESISTIVE ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated that complies with ASTM C 920 requirements, including those referenced for Type, Grade, Class, and Uses, and requirements specified in this Section applicable to fire-resistive joint sealants.
  - 1. Sealant Colors: Color of exposed joint sealants as selected by the Commissioner.
- B. Single-Component, Neutral-Curing Silicone Sealant: Type S; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, G, A, and (as applicable to joint substrates indicated) O.
  - 1. Additional Movement Capability: Provide sealant with the capability to withstand 33 percent movement in both extension and compression for a total of 66 percent movement.
- C. Multi-Component, Non-Sag, Urethane Sealant: Type M; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, A, and (as applicable to joint substrates indicated) O.
  - 1. Additional Movement Capability: Provide sealant with the capability to withstand 40 percent movement in extension and 25 percent in compression for a total of 65 percent movement in joint width existing at time of installation, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, and remain in compliance with other requirements of ASTM C 920 for uses indicated.
- D. Single-Component, Non-Sag, Urethane Sealant: Type S; Grade NS; Class 25; and Uses NT, M, A, and (as applicable to joint substrates indicated) O.



## 2.5 MINERAL FIBER/CERAMIC WOOL NON-COMBUSTIBLE INSULATION (FIRE SAFING)

- A. Provide min. 4 pcf Thermafiber as manufactured by Thermafiber Co., min. 4 pcf FBX Safing Insulation as manufactured by Fibrex, or approved equal to suit conditions and to comply with fire resistance and firestop manufacturer's requirements.
- B. Material shall be classified non-combustible per ASTM E 119.

## 2.6 MIXING

- A. For those products requiring mixing prior to application, comply with firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce firestopping products of uniform quality with optimum performance characteristics for application indicated.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions with Installer present, for compliance with requirements for opening configuration, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
  - 1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
  - 2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
  - 3. Remove laitance and form release agents from concrete.
- B. Priming: Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing seal of firestopping with substrates.

### 3.3 CONDITIONS REQUIRING FIRESTOPPING

- A. Interior Walls and Partitions
  - 1. Construction joints between top of fire rated walls and underside of floors above, shall be firestopped.

2. Firestop system installed shall have been tested by either UL or Omega Point, including exposure to hose stream test and including for use with steel fluted deck floor assemblies.
3. Firestop system used shall allow for deflection of floor above.

B. Penetrations

1. Penetrations include conduit, cable, wire, pipe, duct, or other elements which pass through one or both outer surfaces of a fire rated floor, wall, or partition.
2. Except for floors on grade, where a penetration occurs through a structural floor or roof and a space would otherwise remain open between the surfaces of the penetration and the edge of the adjoining structural floor or roof, provide firestopping to fill such spaces in accordance with ASTM E 814.
3. These requirements for penetrations shall apply whether or not sleeves have been provided, and whether or not penetrations are to be equipped with escutcheons or other trim. If penetrations are sleeved, firestop annular space, if any, between sleeve and wall of opening.

- C. Provide firestopping to fill miscellaneous voids and openings in fire rated construction in a manner essentially the same as specified herein before.

3.4 INSTALLING THROUGH PENETRATION FIRESTOPS

- A. General: Comply with the through penetrations firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for through penetration firestop systems by proven techniques to produce the following results:
  1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
  2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
  3. For fill materials that will remain exposed after completing work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.5 INSTALLING FIRE RESISTIVE JOINT SEALANTS

- A. General: Comply with ASTM C 1193, and with the sealant manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install joint fillers to provide support of sealants during application and at position required to produce the cross sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire resistance rating required.

- C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross sectional shapes and depths relative to joint width that optimum sealant movement capability. Install sealants at the same time joint fillers are installed.
- D. Tool no sag sealants immediately after sealant application and prior to the time skinning or curing begins. Form smooth, uniform beads of configuration indicated or required to produce fire resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

### 3.6 INSTALLING FIRESAFING INSULATION

- A. Install fire safing insulation utilizing welded or screw applied galvanized steel impaling pins and retaining clips; space clips or pins 24" o.c. maximum.
- B. Completely fill voids in areas where safing insulation is required. At spandrel conditions/floor edges, depth of insulation top to bottom shall be at least four (4) inches.
- C. Cover top of all safing insulation with firestop sealant or spray.

### 3.7 FIELD QUALITY CONTROL

- A. Special Inspecting agency employed and paid by the City of New York will examine completed firestopping to determine, in general, if it is being installed in compliance with requirements.
- B. Special Inspecting agency will report observations promptly and in writing to Contractor, City of New York and Commissioner.
- C. Do not proceed to enclose firestopping with other construction until reports of examinations are issued.
- D. Where deficiencies are found, Contractor must 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 product firestopping complying with specified requirements.

END OF SECTION

## SECTION 07 90 00

## JOINT SEALERS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the joint sealers work as shown on the drawings and/or specified herein, including but not necessarily limited to the following:
  - 1. Flashing reglets and retainers.
  - 2. Coping joints.
  - 3. Exterior wall joints not specified to be sealed in other Sections of work.
  - 4. Interior wall joints not specified to be sealed in other Sections of work, including caulking to fill between architectural woodwork and any wall, floor and/or ceiling imperfections.
  - 5. Control and expansion joints in walls.
  - 6. Joints at wall penetrations.
  - 7. Joints between items of equipment and other construction.
  - 8. All other joints required to be sealed to provide a positive barrier against penetration of air and moisture.

## 1.3 RELATED SECTIONS

- A. Division 01 –DDC General Conditions.
- B. Roofing – Section 07 52 00.
- C. Firestop sealants – Section 07 84 13.
- D. Glazing sealants - Section 08 80 00.

- E. Sealant within drywall construction - Section 09 26 00.
- F. Sealant at tile work - Section 09 30 00.

#### 1.4 QUALITY ASSURANCE

- A. Qualification of Installers: Use only personnel who are thoroughly familiar, skilled and specially trained in the techniques of sealant work, and who are completely familiar with the published recommendations of the sealant manufacturer.
- B. Pre-Construction Field Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to project joint substrates according to the method in ASTM C 794 and C 1521 that is appropriate for the types of Project joints.
- C. Perform testing per ASTM C 1248 on interior and exterior sealants to determine if sealants or primers will stain adjacent surfaces. No sealant work shall start until results of these tests have been submitted to the Commissioner and he has given his written approval to proceed with the work.

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate

the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).

4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Shop Drawings: Submit shop drawings showing all joint conditions, indicating relation of adjacent materials, all sealant materials (sealant, bond breakers, backing, primers, etc.), and method of installation.
1. Submit joint sizing calculations certifying that movement capability of sealant is not being exceeded.
- C. Samples: Submit the following:
1. Color samples of sealants.
  2. Sealant bond breaker and joint backing.
- D. Product Data: Submit manufacturer's technical information and installation instructions for:
1. Sealant materials, indicating that material meets standards specified herein.
  2. Backing rods.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 ENVIRONMENTAL CONDITIONS

- A. Temperature: Install all work of this Section when air temperature is above forty (40) degrees F. and below eighty (80) degrees F., unless manufacturer submits written instructions permitting sealant use outside of this temperature range.
- B. Moisture: Do not apply work of this Section on surfaces which are wet, damp, or have frost.

## 1.8 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section, before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.
- C. Storage
  - 1. Store sealant materials and equipment under conditions recommended by their manufacturer.
  - 2. Do not use materials stored for a period of time exceeding the maximum recommended shelf life of the material.

## 1.9 GUARANTEE

- A. Provide a written, notarized guarantee from the applicator stating that the applied sealants shall remain watertight for a period of two (2) years.
- B. Guarantee shall be in a form acceptable to the City of New York and executed by an authorized individual.
- C. Guarantee shall further state that installed sealant is guaranteed against:
  - 1. Adhesive or cohesive failure of sealant joints.
  - 2. Cracking greater than three (3) mils in depth developing on surface of material.
  - 3. Staining of surfaces adjacent to joints by sealants or primer by migration through building materials in contact with them.
  - 4. Chalking, or visible color change on surface of cured sealant.
  - 5. Increase or decrease of "Shore A" durometer hardness (5 second reading) of sealant of more than thirty (30) percent of seven (7) day value of "Shore A" durometer hardness of sealant.
- D. Include in guarantee provision, agreement to repair and/or replace, sealant defects which develop during guarantee period, because of faulty labor and/or materials.

## PART 2 PRODUCTS

### 2.1 SEALANT MATERIALS

- A. Exterior Wall Sealant: Provide one (1) part non-sag sealant equal to No. 790 or 795 by Dow Corning, "Silpruf SCS 2000" or "LM SCS 2700" by G.E., "Spectrem 1" or "Spectrem 3" by Tremco, "Sonolastic 150" by Sonneborn, or approved equal, conforming to the minimum standards of ASTM C 920, Type S, Grade NS, Class 50.
- B. Interior Sealant: Provide a one (1) part acrylic based sealant conforming to ASTM C 834, equal to "AC-20+ Silicone" by Pecora or equal made by Tremco, Dow Corning, or approved equal.
- C. Acoustical Sealant: USG "Acoustical Sealant," "Tremco Acoustical Caulking" of Tremco Mfg. Co., "AC-20 FTR" of Pecora Corp., or approved equal.

- D. Colors: Custom colors of sealants as selected by the Commissioner.

## 2.2 MISCELLANEOUS MATERIALS

- A. Back-Up Materials: Provide back-up materials and preformed joint fillers, non-staining, non-absorbent, compatible with sealant and primer, and of a resilient nature, equal to "Sof-Rod" by Nomaco Inc. or approved equal, twenty-five (25) percent wider than joint width. Materials impregnated with oil, bitumen or similar materials shall not be used. Provide back-up materials only as recommended by sealant manufacturer in writing.
- B. Provide bond breakers, where required, of polyethylene tape as recommended by manufacturer of sealant.
- C. Provide primers recommended by the sealant manufacturer for each material to receive sealant. Note that each exterior joint must be primed prior to sealing.
- D. Provide solvent, cleaning agents and other accessory materials as recommended by the sealant manufacturer.
- E. Materials shall be delivered to the job in sealed containers with manufacturer's original labels attached. Materials shall be used per manufacturer's printed instructions.
- F. Provide continuous neoprene or EPDM closure strips at the underside of roof deck /top of partitions and walls.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where joint sealers are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions required by this Project where more stringent installation requirements are specified herein, such requirements shall apply.
- B. Sample Section of Sealant
  1. During sealant installation work in exterior wall, the manufacturer of sealant shall send his representative to the site, under whose supervision a section of the wall (used as "control section") shall be completed for purposes of determining performance characteristics of sealant in joints. Commissioner shall be informed of time and place of such installation of control section.
  2. Control section shall be installed according to specification given herein and shall not be considered as acceptable until written acceptance is provided by the Commissioner.
  3. Accepted control section shall be standard to which all other sealant work must conform.



- C. Supervision: The Contractor shall submit to the Commissioner written certification from the sealant manufacturer that the applicators have been instructed in the proper application of their materials. The Contractor shall use only skilled and experienced workmen for installation of sealant.
- D. Apply sealant under pressure with a hand or power actuated gun or other appropriate means. Gun shall have nozzle of proper size and provide sufficient pressure to completely fill joints as detailed. Neatly point or tool joint to provide the contour as indicated on the drawings.
- E. Preparation and Application
1. Thoroughly clean all joints, removing all foreign matter such as dust, oil, grease, water, surface dirt and frost. Sealant must be applied to the base surface. Previously applied film must be entirely removed.
  2. Stone, masonry and concrete surfaces to receive sealant shall be cleaned where necessary by grinding, water blast cleaning, mechanical abrading, or combination of these methods as required to provide a clean, sound base surface for sealant adhesion.
    - a. Do not use any acid or other material which might stain surfaces.
    - b. Remove laitance by grinding or mechanical abrading.
    - c. Remove loose particles present or resulting from grinding, abrading, or blast cleaning by blowing out joints with compressed air, oil and water free, or vacuuming joints prior to application of primer or sealant.
  3. Clean non-porous surfaces such as metal and glass chemically. Remove protective coatings on metallic surfaces by solvent that leaves no residue and is compatible with sealant. Use solvent and wipe dry with clean, dry lint free paper towels. Do not allow solvent to air dry without wiping. Clean joint areas protected with masking tape or strippable films as above after removal of tape film.
  4. Do not seal joints until they are in compliance with drawings, or meet with the control section standard.
  5. Joint Size and Sealant Size: Joints to receive sealant shall be at least 1/4" wide. In joint 1/4" to 3/8" wide, sealant shall be 1/4" deep. In joints wider than 3/8" and up to 1" wide, sealant depth shall be one half the joint width. For joints wider than 1", sealant depth shall be as recommended by the sealant manufacturer. Depth of joint is defined as distance from outside face of joint to closest point of the filler.
  6. Primer: Thoroughly clean joints and apply primer to all surfaces that will receive sealant. Apply primer on clean, dry surfaces, and prior to installation of joint backing. Completely wet both inner faces of the joint with primer. Mask adjacent surfaces of joint with non-staining masking tape prior to priming.
  7. Joint Backing: In joints where depth of joint exceeds required depth of sealant, install joint backing (after primer is dry) in joints to provide backing and proper joint shape for sealant. Proper shape for sealant is a very slight "hourglass" shape, with back and front face having slight concave curvature. Use special blunt T-shaped tool or roller to install joint backing to the proper and uniform depth required for the sealant. Joint backing shall be installed with approximately twenty-

- five (25) percent compressions. Do not stretch, twist, braid, puncture, or tear joint backing. Butt joint backing at intersections.
8. Bond Breaker: Install bond breaker smoothly over joint backing so that sealant adheres only to the sides of the joint and not backing.
  9. Sealant Application: Apply sealant in accordance with the manufacturer's application manual and manufacturer's instructions, using hand guns or pressure equipment, on clean, dry, properly prepared substrates, completely filling joints to eliminate air pockets and voids. Mask adjacent surfaces of joint with non-staining masking tape. Force sealant into joint in front of the tip of the "caulking gun" (not pulled after it) and force sealant against sides to make uniform contact with sides of joint and to prevent entrapped air or pulling of sealant off of sides. Fill sealant space solid with sealant.
  10. Tooling: Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 5A in ASTM C 1193. Finished joints shall be straight, uniform, smooth and neatly finished. Remove masking tape immediately after tooling of sealant and before sealant face starts to "skin" over. Neatly remove any excess sealant from adjacent surfaces of joint, leaving the work in a neat, clean condition.
  11. Replace sealant which is damaged during construction process.

END OF SECTION

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## SECTION 08 11 13

## STEEL DOORS AND FRAMES

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the steel doors and frames work as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Interior and exterior hollow metal doors and frames for fire rated and unrated door openings.
  - 2. Trimmed openings.
  - 3. Interior hollow metal vision panels.
  - 4. Preparation of metal doors and frames to receive finish hardware, including reinforcements, drilling and tapping necessary.
  - 5. Preparation of hollow metal doors to receive glazing where required.
  - 6. Furnishing anchors for building into masonry and drywall.
  - 7. Factory prime painting of work of this Section.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Unit Masonry - Section 04 20 00.
- C. Installation of doors and frames - Section 06 20 00.
- D. Finish hardware - Section 08 71 00.
- E. Glass and glazing - Section 08 80 00.

F. Gypsum drywall – Section 09 26 00.

G. Painting - Section 09 90 00.

#### 1.4 SUBMITTALS

A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: LEED Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Include construction details, material descriptions, core descriptions, label compliance, compliance with standards referenced herein, sound and fire-resistance ratings, and finishes for each type of door and frame specified.

- C. Shop Drawings: Show fabrication and installation of doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, reinforcement for surface applied hardware, dimensions of profiles and hardware preparation, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessories.
- D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Drawings.
  - 1. Coordinate glazing frames and stops with glass and glazing requirements.
- E. Oversize Construction Certification: For door assemblies required to be fire rated and exceeding limitations of labeled assemblies, submit certification of a testing agency acceptable to authorities having jurisdiction that each door and frame assembly has been constructed to comply with design, materials, and construction equivalent to requirements for labeled construction.

#### 1.5 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 0133200.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing custom steel doors and frames similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- C. Source Limitations: Obtain custom steel doors and frames through one source from a single manufacturer.
- D. Fire-Rated Door and Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated.
  - 1. Test Pressure: Test according to NFPA 252 or UL 10C. After 5 minutes into the test, the neutral pressure level in furnace shall be established at 40" or less above the sill.

2. **Oversize Fire-Rated Door Assemblies:** For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors comply with standard construction requirements for tested and labeled fire-protection-rated door assemblies except for size.
  3. **Temperature-Rise Rating:** At exit enclosures, provide doors that have a temperature-rise rating of 250 deg. F. (or greater if required by Code) maximum in 30 minutes of fire exposure.
- E. **Fire-Rated, Borrowed-Light Frame Assemblies:** Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9. Label each individual glazed lite.
- F. **Smoke-Control Door Assemblies:** Comply with NFPA 105 or UL 1784.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames palleted, wrapped, or crated to provide protection during transit and Project site storage. Do not use nonvented plastic.
- B. Inspect doors and frames, on delivery, for damage. Minor damage may be repaired provided refinished items match new work and are approved by Commissioner; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames under cover at building site. Conform to the requirements of ANSI A 250-11-2001 for site storage unless more stringent requirements are noted herein. Place units on minimum 4-inch high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. If wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch spaces between stacked doors to permit air circulation.

### PART 2 PRODUCTS

#### 2.1 FABRICATION - GENERAL

- A. Fabricate hollow metal units to be rigid, neat in appearance and free from defects, warp or buckle. Accurately form metal to required sizes and profiles. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible. Metallic filler to conceal manufacturing defects is not acceptable.
- B. Unless otherwise indicated, provide countersunk flat Phillips or Jackson heads for exposed screws and bolts.
- C. Prepare hollow metal units to receive finish hardware, including cutouts, reinforcing, drilling and tapping in accordance with Finish Hardware Schedule and templates provided by hardware suppliers. Comply with applicable requirements of ANSI A115 "Specifications for Door and Frame Preparation for Hardware."
- D. Locate finish hardware as shown on final shop drawings in accordance with locations noted herein.

## 2.2 MANUFACTURERS

- A. Provide products manufactured by Steelcraft, Curries, Ceco Door Products, or approved equal meeting these specifications.

## 2.3 FRAMES

### A. Materials

1. Frames for exterior openings shall be made of commercial grade cold-rolled steel conforming to ASTM A 1008/A, Type B not less than 14 ga., and shall have a hot dipped galvanized coating conforming to ASTM A 924 and A 653 with A-60 coating. The zinc-alloy coating shall be a dull matte surface treated for paint adhesion.
2. Frames for interior openings shall be either commercial grade cold-rolled steel conforming to ASTM A 1008/A, Type B or commercial grade hot-rolled steel conforming to ASTM A 1011/A, Commercial Steel, Type B. Metal thickness shall be not less than sixteen (16) ga. for frames in openings 4'-0" or less in width; not less than fourteen (14) ga. for frames in openings over 4'-0" in width.

### B. Design and Construction

1. All frames shall be welded units with integral trim, of the sizes and shapes shown on approved shop drawings.
2. All finished work shall be strong and rigid, neat in appearance, square, true and free of defects, warp or buckle. Molded members shall be clean cut, straight and of uniform profile throughout their lengths.
3. Jamb depths, trim, profile and backbends shall be as shown on drawings.
  - a. Frames at drywall partitions shall be formed with double return backbends to prevent cutting into drywall surface.
4. Welded frames shall have corners mitered and reinforced and faces of welded frames shall be continuously back welded full depth and width of frame conforming to NAAMM Standard HMMA-820; face joints shall be hairline.
5. Minimum depth of stops shall be 5/8".
6. Frames for multiple or special openings shall have mullion and/or rail members which are closed tubular shapes having no visible seams or joints. All joints between faces of abutting members shall be securely welded and finished smooth.
  - a. Mullions shall have 16 ga. internal steel stiffeners welded not less than 4" o.c.
7. Hardware Reinforcements
  - a. Frames shall be mortised, reinforced, drilled and tapped at the factory for fully-templated mortised hardware only, in accordance with approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates.
  - b. Minimum thickness of hardware reinforcing plates shall be as follows:



- 1). Hinge and pivot reinforcements - seven (7) ga., 1-1/4" x 10" minimum size.
  - 2). Strike reinforcements - twelve (12) gauge
  - 3). Flush bolt reinforcements - twelve (12) gauge
  - 4). Closer reinforcements - twelve (12) gauge
  - 5). Reinforcements for surface mounted hardware - twelve (12) gauge.
8. Floor Anchors
- a. Provide adjustable floor anchors, providing not less than two (2) inch height adjustment.
  - b. Minimum thickness of floor anchors shall be fourteen (14) gauge.
9. Jamb Anchors
- a. Frames for installation in masonry walls shall be provided with adjustable jamb anchors of the wire type. Anchors shall be not less than 0.156" diameter steel wire. The number of anchors provided on each jamb shall be as follows:
    - 1). Frames up to 7'-6" height - three (3) anchors.
    - 2). Frames 7'-6" to 8'-0" height - four (4) anchors.
    - 3). Frames over 8'-0" height - one (1) anchor for each 2'-0" or fraction thereof in height
  - b. Frames to be anchored to previously placed concrete or masonry shall be provided with minimum 3/8" concealed bolts set into expansion shields or inserts at six (6) inches from top and bottom and twenty-four (24) inches o.c. Reinforce frames at anchor locations with sixteen (16) gauge sheet steel stiffeners welded to frame at each anchor.
10. Anchors in exterior frames and in masonry walls shall be hot dip galvanized per ASTM A 153.
11. Frames for installation in masonry wall openings more than 4'-0" in width shall have an angle or channel stiffener factory welded into the head. Such stiffeners shall be not less than twelve (12) gauge steel and not longer than the opening width, and shall not be used as lintels or load bearing members.
12. Frames to be installed below polycarbonate clerestory panels that are to receive overhead concealed closers shall be provided with stiffening steel shoe fittings.
13. Dust cover boxes (or mortar guards) of not thinner than twenty-six (26) gauge steel shall be provided at all hardware mortises on frames to be set in masonry or plaster partitions.
14. Ceiling Struts: Minimum 3/8" thick x 2" wide steel.
15. All frames shall be provided with a steel spreader temporarily attached to the feet of both jambs to serve as a brace during shipping and handling.
16. Loose glazing stops shall be of cold rolled steel, not less than twenty (20) gauge thickness, butted at corner joints and secured to the frame with countersunk cadmium-or zinc-plated screws. Interior frames may be provided with snap-on glazing stops.

17. Except on weather-stripped frames and sound control door assemblies, drill stops to receive three (3) silencers on strike jambs of single door frames and two (2) silencers on heads of double-door frames.
- C. Finish: After fabrication, all tool marks and surface imperfections shall be removed, and exposed faces of all welded joints shall be dressed smooth. Frames shall then be chemically treated to insure maximum paint adhesion and shall be coated on all surfaces with one coat of rust-inhibitive baked-on alkyd primer standard with the manufacturer which is fully cured before shipment to a dry film thickness of 2.0 mils.
1. Frames set in masonry walls shall be grouted in as described in Section 042000 – Unit Masonry. These frames shall have surfaces in contact with grout shop coated with epoxy coating equal to Series 27 FC Typoxy made by Tnemec or approved equal spray applied at 4 to 6 mils, passing NFPA 101, Class A for smoke and flame spread, tested per ASTM E 84.

#### 2.4 HOLLOW METAL DOORS

- A. Materials: Doors shall be made of commercial quality, level, cold rolled steel conforming to ASTM A 1008/A, Commercial Steel, Type B and free of scale, pitting or other surface defects. Face sheets for interior doors shall be not less than eighteen (18) gauge on doors 8'-0" tall or less; sixteen (16) gauge for doors greater than 8'-0" tall. Face sheets for exterior doors shall be not less than sixteen (16) gauge and shall have a hot dipped galvanized coating conforming to ASTM A 924 and A 653, A-60 coating. The zinc alloy coating shall be a dull matte surface treated for paint adhesion.
- B. Design and Construction
1. All doors shall be of the types and sizes shown on the approved shop drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Minimum door thickness shall be 1-3/4".
  2. All doors shall be strong, rigid and neat in appearance, free from warpage or buckles. Corner bends shall be true and straight and of minimum radius for the gauge of metal used.
  3. Face sheets shall be stiffened by continuous vertical formed steel sections spanning the full thickness of the interior space between door faces. These stiffeners shall be not less than twenty two (22) gauge spaced not more than six (6) inches apart and securely attached to face sheets by spot welds not more than five (5) inches o.c. Spaces between stiffeners shall be sound deadened and thermal insulated the full height of the door with an inorganic non-combustible batt type material.
  4. Door faces shall be joined at their vertical edges by a continuous weld extending the full height of the door. All such welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.
  5. Top and bottom edges of all doors shall be closed with a continuous recessed steel channel not less than fourteen (14) gauge, extending the full width of the door and spot welded to both faces. Exterior doors shall have an additional flush closing channel at their top edges and, where required for attachment of weatherstripping, a flush closure also at their bottom edges. Openings shall be provided in the bottom closure of exterior doors to permit the escape of entrapped moisture.

6. Edge profiles shall be provided on both vertical edges of doors as follows:
  - a. Single-acting swing doors - beveled 1/8" in two (2) inches.
  - b. Double acting swing doors - rounded on 2-1/8" radius.
  - c. No square edge doors permitted.
7. Hardware Reinforcements
  - a. Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware only in accord with the approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware (or hardware, the interrelation of which is to be adjusted upon installation - such as top and bottom pivots, floor closers, etc.) is to be applied, doors shall have reinforcing plates.
  - b. Minimum gauges for hardware reinforcing plates shall be as follows:
    - 1). Hinge and pivot reinforcement - seven (7) gauge.
    - 2). Reinforcement for lock face, flush bolts, concealed holders, concealed or surface mounted closers - twelve (12) gauge.
    - 3). Reinforcements for all other surface mounted hardware - sixteen (16) gauge.
8. Glass Moldings and Stops
  - a. Where specified or scheduled, doors shall be provided with hollow metal moldings to secure glazing by others in accordance with glass opening sizes shown on drawings.
  - b. Fixed moldings shall be securely welded to the door on the security side.
  - c. Loose stops shall be not less than twenty (20) gauge steel, with mitered corner joints, secured to the framed opening by cadmium or zinc-coated countersunk screws spaced eight (8) inches o.c. Snap-on attachments will not be permitted. Stops shall be flush with face of door.
- C. Finish: After fabrication, all tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities. Doors shall then be chemically treated to insure maximum paint adhesion and shall be coated, on all exposed surfaces, with manufacturer's standard rust-inhibitive alkyd primer as specified for frames which shall be fully cured before shipment.
- D. Flatness: Doors shall maintain a flatness tolerance of 1/16" maximum, in any direction, including in a diagonal direction.

## 2.5 LABELED DOORS AND FRAMES

- A. Labeled doors and frames shall be provided for those openings requiring fire protection ratings as scheduled on drawings. Such doors and frames shall be labeled by Underwriters' Laboratories or other nationally recognized agency having a factory inspection service.
- B. If any door or frame specified by the Commissioner to be fire-rated cannot qualify for appropriate labeling because of its design, size, hardware or any other reason, the Commissioner shall be so advised before fabricating work on that item is started.

## 2.6 HARDWARE LOCATIONS

- A. The location of hardware on doors and frames shall be as noted in "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames" of the Door Hardware Institute unless otherwise required by prevailing Handicap Codes.

## 2.7 CLEARANCES

- A. Fabricate doors and frames to meet edge clearances as follows:

1. Jamb and Head: 1/8" plus or minus 1/16".
2. Meeting Edges, Pairs of Doors: 1/8" Plus or minus 1/16".
3. Bottom: 3/4", if no threshold.
4. Bottom: 3/8", at threshold.

- B. Fire rated doors shall have clearances as required by NFPA 80.

## 2.8 MANUFACTURING TOLERANCES

- A. Manufacturing tolerance shall be maintained within the following limits:

### 1. Frames for Single Door or Pair of Doors

- a. Width, Measured Between Rabbets at the Head

- 1). Nominal opening width +1/16", -1/32"

- b. Height (total length of jamb rabbet):

- 1). Nominal opening height + 3/64"

- c. Cross Sectional Profile Dimensions

- 1). Face: + 1/32"
- 2). Stop: + 1/32"
- 3). Rabbet: + 1/64"
- 4). Depth: + 1/32"
- 5). Throat: + 1/16". Frames overlapping walls to have throat dimension 1/8" greater than dimensioned wall thickness to accommodate irregularities in wall construction.

### 2. Doors

- a. Width: + 3/64"

- b. Height: + 3/64"

- c. Thickness: + 1/16"

- d. Hardware Cutout Dimensions

- 1). Template dimensions +0.015", -0"

- e. Hardware Location: + 1/32"

2.9 PREPARATION FOR FINISH HARDWARE

- A. Prepare door and frames to receive hardware:
  - 1. Hardware supplier shall furnish hollow metal manufacturer approved hardware schedule, hardware templates, and samples of physical hardware where necessary to insure correct fitting and installation.
  - 2. Preparation includes sinkages and cut-outs for mortise and concealed hardware.
- B. Provide reinforcements for both concealed and surface applied hardware:
  - 1. Drill and tap mortise reinforcements at factory, using templates.
  - 2. Install reinforcements with concealed connections designed to develop full strength of reinforcements.

2.10 REJECTION

- A. Hollow metal frames or doors which are defective, have hardware cutouts of improper size or location, or which prevent proper installation of doors, hardware or work of other trades, shall be removed and replaced with new at no cost.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where steel doors and frames are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Refer to Section 06 20 00 for installation procedures for all work of this Section.

END OF SECTION

## SECTION 08 14 00

## WOOD DOORS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the wood doors as shown on the drawings and/or specified herein, including but not limited to, the following:
  - 1. Solid core flush wood doors.
  - 2. Fire rated flush wood doors.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Installation of wood doors - Section 06 20 00.
- C. Hollow metal frames - Section 08 11 13
- D. Finish hardware - Section 08 71 00.
- E. Glass and glazing – Section 08 80 00.
- F. Field painting – Section 09 90 00.

## 1.4 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: LEED Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit door manufacturer's product data, specifications and installation instructions for each type of wood door.
1. Include details of core and edge construction and trim for openings.
  2. Include factory finish specifications.
  3. Include certifications to show compliance with specifications.
  4. Include certification to show compliance with WDMA TM-7 test for 1 million slams.
- C. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for finishing and other pertinent data.
1. Include requirements for veneer matching.
- D. Submit the following

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.

#### 1.5 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.
- B. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated"; latest edition "Premium" grade.
  1. Only manufacturers that are certified and listed by AWI to be QCP qualified are acceptable for this project.
  2. Provide letter of licensing for Project indicating that doors comply with requirements of grade specified.
- C. Fire Rated Wood Doors: Doors complying with Category A, Positive Pressure or Neutral Pressure testing standards per UBC 7-2-1997 and UL 10-C (UBC 7-2-1994 and UL 10B) that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated on Door Schedule, based on testing according to NFPA 252.
  1. Conform to prevailing Code requirements to determine which pressure standard (Positive or Neutral) is required.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.



## 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

## 1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) in excess of permitted standard noted in Article 2.3 herein, or show telegraphing of core construction in face veneers.
  - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
  - 2. Warranty shall be in effect during the following period of time from date of Substantial Completion:
    - a. Solid Core Flush Wood Doors: Life of installation.
    - b. Stile and Rail Wood Doors: Five years.

## PART 2 PRODUCTS

### 2.1 SOLID CORE FLUSH WOOD DOORS

- A. Provide AWI PC-5 Premium Grade solid core particleboard doors, 1-3/4" thick, conforming to standards specified herein. Subject to meeting standards specified herein, the following manufacturers are acceptable: Marshfield Door Systems, Inc., Algoma Hardwoods Inc., or Eggers Hardwood Products Corp.
  - 1. Core shall consist of a formed flat panel consisting of wood particles bonded together with synthetic resins or other added binder, with an average density of 33 lbs. per cubic foot. The material shall meet or exceed the requirements of ANSI A208.1, Grade 1-LD-2 covering mat formed particleboard with face screw holding of 125 lbs., modulus of rupture of 800 psi and modulus of elasticity of 150,000 psi.
  - 2. Core shall be capable of satisfying this WDMA TM-7 cycle slam test for 1 million slams for surface mounted hardware. Where the manufacturer's core does not meet this criteria, stiles and rails must measure a minimum of 5-1/2" and must be fabricated of hardwood.
    - a. Surface mounted hardware must be installed with 1-1/4" screw penetrations using threaded to the head screws; coordinate with Section 087100.
- B. Cross Bands: Shall be 1/16" thick hardwood extending full width of door and laid with grain at right angles to face veneers. Cross bands and faces shall be laminated to the core with Type I MF or PVA glue.
- C. Stiles, Rails: Stile edge bands shall be a minimum of 1-3/8" solid hardwood (after trimming) laminated to the core. Stiles and rails must be securely glued to the core with no voids allowed.
- D. Doors with transparent finish to have center balanced, slip matched, quarter sliced, Select American Walnut veneer. Veneer to conform to AWI, "AA" grade veneer with 3" wide leaf. Minimum veneer thickness shall be not less than 1/28" after sanding. Veneer shall match adjacent fixed panels in direction and grain.

## 2.2 SHOP FINISH

- A. Transparent Finish: Finish in the shop with clear satin catalyzed polyurethane finish conforming to AWI System TR-6, Premium grade.
- B. Opaque Finish: For doors to be field painted, shop prime on all surfaces with one coat of alkyd wood primer applied to a dry film thickness of 1.5 mils.

## 2.3 FABRICATION

- A. Prefit and premachine wood doors at the factory.
- B. Comply with the tolerance requirements specified herein. Machine doors for hardware requiring cutting of doors. Comply with final hardware scheduled and door frame shop drawings, and with hardware templates and other essential information required to ensure proper fit of doors and hardware.
- C. Take accurate field measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with machining in the factory.
- D. Doors shall be factory sized to door opening so that trimming and fitting are not required in the field.
- E. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances unless otherwise indicated.
  - 1. Three degree bevel or bevel to suit frame sizes indicated, with 3/16" prefit in width, +0/-1/32" tolerances. Prefit top of door 1/8" + 1/16"/-0" and undercut as required by floor condition. Undercut shall not exceed 1/8" from bottom of door to top of finished floor; where threshold occurs undercut shall not exceed 1/8" from bottom of door to top of threshold.
  - 2. Comply with requirements in NFPA 80 for fire-rated doors.
- F. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3 unless otherwise noted. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
  - 1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
- G. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kinds of doors required.

## 2.4 SOURCE QUALITY CONTROL

- A. Once installed, maximum allowable warp, bow, cut or twist in doors shall be 1/16" as measured by the 1/16 inch feeler gauge and a straight-edge extending from corner to corner of the door face at stiles, top and bottom rails and along both diagonals.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Refer to Section 06 20 00 for installation of wood doors.

END OF SECTION

## SECTION 08 31 00

## ACCESS DOORS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the access doors as indicated on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Framed flush panel access doors at masonry and tile walls.
  - 2. Watertight flush mounted floor access hatches.
  - 3. Provide access doors and frames for access from occupied spaces to the following, where indicated or required, and as directed by the trades of Divisions 22 - 26.
    - a. All shutoff or balancing valves.
    - b. Fire dampers, as required.
    - c. Points of duct access.
    - d. Pull boxes.
    - e. Controls of mechanical and electrical items.
    - f. Masonry shafts for pipes and conduits, as required.
    - g. Pipe spaces, if required.
    - h. Inlets of fans.
    - i. Fusible link and splitter damper at filter bank.
    - j. Automatic damper and motor.
    - k. Equipment not otherwise accessible.
    - l. House Trap

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Masonry - Section 04 20 00.

- C. Drywall - Section 09 29 00.
- D. Ceramic tile - Section 09 30 00.
- E. Valves and connections - Division 22.

#### 1.4 QUALITY ASSURANCE

- A. For actual installation of the work of this Section, use only personnel who are thoroughly familiar with the manufacturer's recommended methods of installation and who are completely trained in the skills required.
- B. Fire-Resistance Ratings: Wherever a fire-resistance classification is shown, or for construction where access doors are installed, provide required access door assembly with panel door, frame, hinge and latch from manufacturers listed in Underwriters' Laboratories, Inc. "Classified Building Materials Index" for the rating shown.
  - 1. Provide UL label on each access panel.
  - 2. Provide flush, key operated cylinder lock.
- C. Size Variations: Obtain Commissioner's acceptance of manufacturer's standard size units which may vary slightly from sizes shown or scheduled.

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

- 1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
- 2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
- 3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate

the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).

4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Before any materials of this Section are delivered to the job site, submit complete manufacturer's literature to the Commissioner. Submit plans and schedules showing size and location of each and every access door for Commissioner's acceptance prior to installation.
- C. Shop Drawings
1. Shop drawings shall indicate at large scale, profiles, gauges, sizes and reinforcing and anchorage devices, for securing to adjacent construction, indicate finish and all accessory elements.
  2. Shop drawings shall include schedules, listing the qualities of each kind and type of frame, trim and door, size of doors and frames, clearances, location and label requirements.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 01 33 00.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

## PART 2 PRODUCTS

## 2.1 MATERIALS AND FABRICATION

- A. Provide access door assembly manufactured by Milcor Inc, or equal made by Nystrom Inc., Karp Associates, Inc. or approved equal. Assembly shall be an integral unit complete with all parts and ready for installation.
- B. Fabricate units of continuous welded steel construction. Grind welds smooth and flush with adjacent surfaces. Provide attachment devices and fasteners of the type required to secure access panels to the types of supports shown.
- C. Frames for Masonry and Tile Wall Only (Flush Panel Units)
  - 1. Fabricate frame from sixteen (16) gauge steel. Provide frame with exposed flange not less than one (1) inch wide around perimeter of frame for the following construction:
    - a. Exposed masonry.
    - b. Tile finish.
  - 2. For installation in masonry construction, provide frames with adjustable metal masonry anchors.
- D. Panels: Fabricate from fourteen (14) gauge steel, with concealed spring hinges set to open to 175 degrees. Provide removable pin type hinges of the quantity required to support the access panel sizes used in the work. Finish with manufacturer's factory applied baked enamel prime coat applied over phosphate protective coating on steel.
- E. Provide flush mounted floor access hatches by Kador, Acudor, Thompson Fabricating or Commissioner approved equal.
  - 1. Provide watertight floor access door, size as indicated as scheduled.
  - 2. Frame shall be watertight with aluminum extrusion with integral anchor flanges and include drain channel and neoprene gasket.
  - 3. Hinges and hardware shall be stainless steel, flush with floor level.
  - 4. Door leaf shall be diamond tread plate to withstand live load of 300 lbs/sq ft. Operation shall be assisted with stainless steel compression springs. A hold open arm shall automatically lock the door in a 90° position.
  - 5. Provide clear, matte slip resistant coating over mill finish.
- F. Locking Devices
  - 1. For non-rated access doors, provide flush, screwdriver operated cam locks of number required to hold door in flush, smooth plane when closed.
  - 2. For fire rated doors, provide locks as described in paragraph 1.4, B. herein.
- G. Inserts and Anchorage: Furnish inserts and anchoring devices which must be built into masonry for the installation of access panels. Provide setting drawings, templates, instructions, and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where access doors are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 COORDINATION

- A. Coordinate all work with the mechanical trades to insure proper locations and in a timely manner to permit orderly progress of the total work.
- B. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.
- C. Adjust hardware and panels after installation for proper operation.
- D. Remove and replace panels or frames which are warped, bowed, or otherwise damaged.

END OF SECTION



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## SECTION 08 41 00

## ALUMINUM ENTRANCES AND STOREFRONTS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the aluminum entrances and storefronts as indicated on the drawings and/or specified herein including the following:
  - 1. Exterior entrance systems.
  - 2. Interior entrance systems.
  - 3. Interior storefront systems.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Joint Sealers - Section 07 90 00.
- C. Glazed Aluminum Curtain Walls - Section 08 44 13.
- D. Finish Hardware - Section 08 71 00.
- E. Glazing - Section 08 80 00.

## 1.4 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit manufacturer's printed product data, specifications, standard details, installation instructions, use limitations and recommendations for each material used. Provide certifications that materials and systems comply with specified requirements.
- C. Shop Drawings: Provide large scale shop drawings for fabrication, installation and erection of all parts of work. Provide plans, elevations, and details of anchorages, connections and accessory items. Provide installation templates for work installed by others. Show interfaces and relationships to work of other trades.
- D. Field Measurements: Take necessary field measurements before preparation of shop drawings and fabrication. Do not delay progress of job. If field measurements are not possible prior to fabrication, allow for field cutting and fitting.
- E. Initial Selection Samples: Submit samples showing complete range of colors, textures, and finishes available for each material used.
- F. Verification Samples: Submit representative samples of each material that is to be exposed in completed work. Show full color ranges and finish variations expected. Provide samples having minimum size of 144 sq. in.

G. Calculations: Provide professionally prepared calculations and certification of performance of this work. Indicate how design requirements for loading and other performance criteria have been satisfied; refer to Article 1.5, para. D for further description.

H. Test Reports: Provide certified test reports for specified tests.

#### 1.5 LEED PERFORMANCE CRITERIA

A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.

B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.

C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.6 QUALITY ASSURANCE

A. Source: For each material type required for work of this Section, provide primary materials which are products of one manufacturer. Provide secondary or accessory materials which are acceptable to manufacturers of primary materials.

B. Installer: A firm with a minimum of three years experience in type of work required by this Section and which is properly trained by manufacturers of primary materials.

C. Design Criteria: Drawings indicate sizes, member spacings, profiles, and dimensional requirements of work of this Section. Minor deviations will be accepted in order to utilize manufacturer's standard products when, in the Architect's sole judgment, such deviations do not materially detract from the design concept or intended performances.

D. Engineering: Provide services of a Professional Engineer, registered in the jurisdiction in which the Project will be built, to design and certify that work of this Section meets or exceeds performance requirements specified.

#### 1.7 TESTS AND PERFORMANCE REQUIREMENTS

A. Manufacturer's Standard Tests: Provide manufacturer's standard test data showing compliance with specified requirements.

B. Testing and performance data applies to exterior assemblies.

C. Test Sequence: Test sequence is optional, except that air infiltration tests shall precede water resistance tests.

D. Air Infiltration Test: Test unit in accordance with ASTM E 283, as follows:

1. Static Air Pressure Difference: 6.24 psf for fixed storefront units, and 1.567 psf for doors.

2. Performance: Maximum air leakage shall not exceed the following:
    - a. Fixed Storefront Units: 0.06 cfm per sq. ft. of window area.
    - b. Door Units: 0.50 cfm per sq. ft. of single doors, 1.00 cfm per sq. ft. for doors hinged in pairs.
  - E. Water Leakage Test: Test fixed framing system in accordance with ASTM E 331.
    1. Test Pressure: 6.24 psf.
    2. Performance: No leakage as defined in test method at specified test pressure.
  - F. Uniform Load Deflection Test: Test units in accordance with ASTM E 330, at following static air pressure difference (Design Wind Pressure), or loads prescribed by code for this project site, whichever is greater. Apply pressure first to exterior side (positive) and then interior side (negative).
    1. Design Wind Pressure: 30 pounds per square foot minimum.
    2. Test Procedure: Procedure A as specified in ASTM E 330.
    3. Performance: Deflection in each member measured at locations of greatest deflection shall not exceed  $L/175$  at specified Design Wind Pressure.
  - G. Uniform Load Structural Test: Test units in accordance with ASTM E 330 at following static air pressure difference. Apply high pressure load first on one side and then on other side. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or activating mechanisms.
    1. Static Air Pressure: Minimum 1.5 times the Design Wind Pressure.
    2. Permanent Deformation in Any Member: Not to exceed 0.2% of member span.
  - H. Condensation Resistant Factor: Not less than 45 for fixed storefront units, and not less than 48 for doors; per AAMA 1502.7.
  - I. Thermal Movement: Provide storefront systems that allow for expansion and contraction of members throughout an ambient temperature range of 120°F.
  - J. Seismic Loads: Provide entrance and storefront systems, including anchorage, capable of withstanding the effects of earthquake motions calculated according to requirements of authorities having jurisdiction or ASCE 7, "Minimum Design Loads for Buildings and Other Structures", Section 9, "Earthquake Loads", whichever are more stringent.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Deliver materials and products in unopened, factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Store under cover and protect from weather damage.
  - B. Sequence deliveries to avoid delays, but minimize on-site storage.
- 1.9 WARRANTIES
- A. Provide written warranty, signed by manufacturer, agreeing to repair or replace work that exhibits defects in materials or workmanship. "Defects" is defined to include, but

not limited to, leakage of water, abnormal aging or deterioration, abnormal deterioration or fading of finishes, and failure to perform as required. Include requirement for removal and replacement of covering and connected adjacent work.

1. Warranty Period: Three (3) years from date of Substantial Completion; except finish shall be warranted for a period of fifteen (15) years from date of Substantial Completion.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS/PRODUCTS

- A. Provide storefronts and entrance systems of one of the following manufacturers that meet or exceed requirements of these specifications:

1. Kawneer Company, Inc.
2. Wausau Metals Corporation.
3. EFCO.
4. Oldcastle.

- B. Products:

1. Exterior frame system shall be equal to Tri-Fab Versaglaze 451T; 2" sightline, 4-1/2" deep thermal frame; manufactured by Kawneer Company, Inc.; or approved equal manufacturer listed above.
2. Interior frame system shall be equal to Tri-Fab Versaglaze 450 Standard; 1-3/4" sightline, 4-1/2" deep frame; manufactured by the Kawneer Co. Inc. or approved equal manufacturer listed above.
3. Doors for interior and exterior application shall be equal to "Narrow Stile 190" manufactured by the Kawneer Co. Inc. or approved equal manufacturer listed above.

### 2.2 MATERIALS AND ACCESSORIES

- A. Aluminum Members: Provide 6063-T5 alloy and temper as recommended by manufacturer for strength, corrosion resistance, and application of required finish. Comply with ASTM B 221 for extrusions, and ASTM B 209 for sheet/plate. Provide 0.125 in. thick extrusions for door stiles and storefront framing. Provide 0.050 in. thick aluminum for glazing moldings.

1. Structural aluminum shapes shall conform to ASTM B 308.

- B. Fasteners: Provide non-magnetic stainless steel fasteners, warranted by manufacturer to be non-corrosive and compatible with aluminum components.

- C. Concealed Flashing: Dead-soft stainless steel, 26 gage minimum, or extruded aluminum 0.062 in. minimum, of an alloy and type selected by manufacturer for compatibility with other components.

- D. Brackets and Reinforcements: Non-magnetic stainless steel or hot-dip galvanized steel complying with ASTM A 386.

- E. Concrete/Masonry Inserts: Cast-iron, malleable iron, or hot-dip galvanized steel complying with ASTM A 386.
- F. Bituminous Coatings: Cold-applied asphalt mastic compounded for 30-mil thickness per coat.
- G. Compression Weatherstripping: Manufacturer's standard replaceable stripping of molded neoprene or PVC gaskets complying with ASTM D 2287.
- H. Sliding Weatherstripping: Manufacturer's standard replaceable stripping of wool, polypropylene, or nylon woven pile, with nylon fabric or aluminum strip backing.

### 2.3 HARDWARE

- A. Provide hardware units as indicated, scheduled, or required for operation of each door. Refer to Section 087100, Finish Hardware for hardware description.

### 2.4 FABRICATION

- A. Sizes and Profiles: Required sizes for door and frame units, including profile requirements, are indicated on Drawings. Any variable dimensions are indicated, together with maximum and minimum dimensions required to achieve design requirements and coordination with other work.
- B. Prefabrication: To greatest extent possible, complete fabrication, assembly, finishing, hardware application, and other work before shipment to project site. Disassemble components only as necessary for shipment and installation.
  - 1. Preglaze door and frame units to greatest extent possible, in coordination with installation and hardware requirements.
  - 2. Do not drill and tap for surface-mounted hardware items until time of installation at project site.
  - 3. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work in manner which prevents damage to exposed finish surfaces. For hardware, perform these operations prior to application of finishes.
- C. Welding: Comply with recommendations of American Welding Society to avoid discoloration; grind exposed welds smooth and restore mechanical finish.
- D. Reinforcing: Install reinforcing as necessary for performance requirements; separate dissimilar metals with bituminous paint or other separator to prevent corrosion.
- E. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.
- F. Fasteners: Conceal fasteners.
- G. Provide EPDM/vinyl blade gasket weatherstripping in bottom exterior door rail, adjustable for contact with threshold.
- H. At interior doors and other locations without weatherstripping, provide neoprene silencers on stops to prevent metal-to-metal contact.

I. Provisions shall be made in the framing for minimum edge clearance, nominal edge cover, and nominal pocket width for the thickness and type of glazing installed, and shall be in accordance with the FGMA Glazing Manual.

J. Pocket glazed framing shall provide:

	<u>Single Glass</u>	<u>Ins. Glass</u>
1. Nominal edge cover (or bite) framing only	5/16"	1/2"
2. Min. nominal edge clearance	1/8"	1/4"
3. Min. face clearance	1/8"	5/32"

2.5 STOREFRONT FRAMING

- A. General: Provide inside-outside matched resilient flush glazed system with provisions for glass replacement. Shop fabricate and preassemble frame components where possible.
- B. Thermal-Break Construction: Fabricate exterior aluminum storefront framing system with integrally concealed, low conductance thermal barrier, located between exterior materials and exposed interior members, in manner which eliminates direct metal-to-metal contact. Provide manufacturer's standard construction which has been in use for similar projects for at least three years.
- C. For glass and glazing, refer to Section 08 80 00.

2.6 ALUMINUM DOORS

- A. Aluminum entrance doors shall be narrow stile factory-glazed aluminum doors, manufactured by same manufacturer as storefront framing.
- B. Aluminum entrance doors shall be stile and rail type swing doors. Aluminum shall be extruded aluminum conforming to ASTM B 221, 0.125 in. thick for door stiles and 0.050 in. thick for glazing molding.
  - 1. Sections shall be of sizes and profiles indicated; shall present straight, sharply defined lines and arrises; and shall be free from defects impairing strength, durability, and appearance.
  - 2. Fasteners where exposed shall be aluminum stainless steel or plated steel conforming to ASTM A 164.
- C. Each door shall be factory glazed set in neoprene glazing gasket, refer to Section 08 80 00 for glass.
- D. Doors shall meet the following resistance to corner racking when tested by the Dual Moment Load Test.
  - 1. Test section shall consist of a standard top door corner assembly. Side rail section shall be 24" long and top rail section shall be 12" long.
  - 2. Anchor "top rail" positively to test bench so that corner protrudes 3" beyond bench edge.
  - 3. Anchor a lever arm positively to "side rail" at a point 19" from inside edge of "top rail". Attach weight support pad at a point 19" from inner edge of "side rail".



4. Test section shall withstand a load of 235 lbs. On the lever arm before reaching the point of failure, which shall be considered a rotation of the lever arm in excess of 45 deg.
- E. Air Infiltration: (Applies only to single acting offset pivot or butt hung entrances).
  1. Air infiltration shall be tested in accordance with ASTM E 283, at a pressure differential of 1.567 psf. A single 3'-0" x 7'-0" entrance door and frame shall not exceed .50 cfm per linear foot of perimeter crack. A pair of 6'-0" x 7'-0" entrance doors and frame shall not exceed 1.0 cfm per linear foot of perimeter crack.
- F. For door hardware, refer to Section 08 71 00.
- G. Door bottom rail of exterior doors shall have an EPDM blade gasket sweep strip applied with concealed fasteners.
- H. Corner construction shall consist of mechanical clip fastening, SIGMA deep penetration and fillet welds. Glazing stops shall be hook-in type with EPDM glazing gaskets.
- I. The door weatherstripping on a single acting offset pivot or butt hung exterior door and frame (single or pairs) shall be thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.
- J. The door weatherstripping on a double acting, center pivoted door and frame (single or pairs) shall be pile cloth. The door bottom rail shall be weathered with an EPDM blade gasket sweep strip applied with concealed fasteners.
- K. The meeting stiles on pairs of doors shall be equipped with an adjustable astragal.

## 2.7 FINISH

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where aluminum entrances and storefronts are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 INSTALLATION

- A. Install aluminum entrance doors and storefront framing in openings prepared under other Sections plumb, square, level, in exact alignment with surrounding work, with proper clearances, and securely and positively anchored to building structure, to meet

performance requirements specified herein, in accordance with manufacturer's published instructions and approved submittals.

- B. Use only skilled mechanics for erection, under supervision of manufacturer's representative.
- C. Provide protection against galvanic action. Isolate dissimilar materials with bituminous coating or non-absorptive dielectric tape.
- D. Install aluminum entrance doors, storefront frame, and finish hardware. Carefully fit and adjust doors and hardware to frames and weatherstripping. After erection check and adjust operating hardware for smooth and proper operation.
- E. Set continuous sill members and flashing in a full sealant bed to provide weathertight construction, unless otherwise indicated. Comply with requirements of Section 07 90 00.
- F. Erection Tolerances: Install entrance and storefront systems to comply with the following maximum tolerances.
  - 1. Variation from Plane: Limit variation from plane or location shown to 1/8" in 12'; 1/4" over total length.
  - 2. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16". Where surfaces meet at corners, limit offset from true alignment to 1/32".
  - 3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8".

### 3.3 PROTECTION AND CLEANING OF ALUMINUM

- A. Protect finished metal surfaces from damage during fabrication, shipping, storage, and erection, and from then until acceptance by Owner.
- B. Clean metal surfaces promptly after installation, exercising care to avoid damage. Remove excess sealant, dirt, and other substances. Lubricate hardware and other moving parts.

### 3.4 PROTECTION AND CLEANING OF GLASS

- A. Replace glass that is broken, cracked or chipped prior to time of final acceptance of Project by Owner.
- B. Clean glass surfaces promptly after installation, exercising care to avoid damage to same.

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## SECTION 08 44 13

## GLAZED ALUMINUM CURTAIN WALL

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the wood doors as shown on the drawings and/or specified herein, including but not limited to, the following:
  - 1. Conventionally glazed aluminum curtain walls; stick systems.

## 1.3 RELATED SECTIONS:

- A. List below only products and construction that the reader might expect to find in this Section but are specified elsewhere.
- B. Division 01 – DDC General Conditions.
- C. Joint Sealers - Section 07 90 00.
- D. Aluminum Entrances and Storefronts - Section 08 41 00.
- E. Glazing - Section 08 80 00.

## 1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide glazed aluminum curtain-wall systems, including anchorage, capable of withstanding, without failure, the effects of the following:
  - 1. Structural loads.

2. Thermal movements.
  3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
  4. Dimensional tolerances of building frame and other adjacent construction.
  5. Failure includes the following:
    - a. Deflection exceeding specified limits.
    - b. Thermal stresses transferred to building structure.
    - c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
    - d. Noise or vibration created by wind and thermal and structural movements.
    - e. Loosening or weakening of fasteners, attachments, and other components.
    - f. Sealant failure.
- B. Structural Loads:
1. Wind Loads: As required by NYC Code.
  2. Seismic Loads: As required by NYC Code.
- C. Structural-Test Performance: Provide glazed aluminum curtain-wall systems tested according to ASTM E 330 as follows:
1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
  2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
  3. Test Duration: As required by design wind velocity but not less than 10 seconds.
- D. Deflection of Framing Members:
1. Deflection Normal to Wall Plane: Limited to  $1/175$  of clear span for spans up to 13 feet 6 inches and to  $1/240$  of clear span plus  $1/4$  inch, for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to  $3/4$  inch, whichever is less.
  2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and which reduces edge clearance between framing members and glazing or other fixed components to less than  $1/8$  inch.
  3. Cantilever Deflection: Where framing members overhang an anchor point, limited to 2 times the length of cantilevered member, divided by 175.
- E. Thermal Movements: Provide glazed aluminum curtain-wall systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2. Test Performance: No buckling, stress on glass, glazing-edge seal failure, sealant failure, excess stress on curtain-wall framing, anchors and fasteners, or reduction of performance when tested according to AAMA 501.5.
  - a. Test High Exterior Ambient Air Temperature: That which produces an exterior metal surface temperature of 180 deg F.
  - b. Test Low Exterior Ambient Air Temperature: 0 deg F.
  - c. Test Interior Ambient Air Temperature: 75 deg F.
- F. Air Infiltration: Provide glazed aluminum curtain-wall systems with maximum air leakage of 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure differential of 1.57 lbf/sq. ft.
- G. Water Penetration Under Static Pressure: Provide aluminum glazed curtain-wall systems that do not evidence water penetration when tested according to ASTM E 331 at a minimum differential static pressure of 20 percent of positive design wind load, but not less than 10 lbf/sq. ft.
- H. Water Penetration Under Dynamic Pressure: Provide glazed aluminum curtain-wall systems that do not evidence water leakage when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive design wind load, but not less than 10 lbf/sq. ft.
  1. Maximum Water Leakage: No uncontrolled water penetrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained to exterior and cannot damage adjacent materials or finishes is not considered water leakage.
- I. Condensation Resistance: Provide glazed aluminum curtain-wall systems with condensation-resistance factor (CRF) of not less than 45 when tested according to AAMA 1503.
- J. Average Thermal Conductance: Provide glazed aluminum curtain-wall systems with average U-factor of not more than 0.36 Btu/sq. ft. x h x deg F when tested according to AAMA 1503.
- K. Sound Transmission: Provide glazed aluminum curtain-wall systems with minimum STC 32 according to ASTM E 413 and an OITC 26 according to ASTM E 1332, as determined by testing according to ASTM E 90.

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113.13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:

- a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies
- B. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.
- C. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication and assembly of glazed aluminum curtain-wall systems.
1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Samples for Initial Selection: For units with factory-applied color finishes.
- E. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- F. Fabrication Sample: Of each vertical-to-horizontal intersection of systems, made from 12-inch lengths of full-size components and showing details of the following:
1. Joinery.
  2. Anchorage.
  3. Expansion provisions.
  4. Glazing.
  5. Flashing and drainage.

- G. Welding certificates.
- H. Qualification Data: For Installer.
- I. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for glazed aluminum curtain-wall systems.
- J. Field quality-control test reports.
- K. Warranties: Special warranties specified in this Section.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Capable of assuming engineering responsibility and performing Work of this Section and who is properly trained by the manufacturer.
  - 1. Engineering Responsibility: Preparation of data for glazed aluminum curtain-wall systems including the following:
    - a. Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer's standard assemblies.
    - b. Shop Drawings, Project-specific preconstruction-testing program development, and comprehensive engineering analysis by a qualified professional engineer.
- B. Testing Agency Qualifications: An independent agency qualified according to ASTM E 699 for testing indicated.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.



1. Do not modify intended aesthetic effects, as judged solely by Commissioner, except with Commissioner's approval. If modifications are proposed, submit comprehensive explanatory data to Commissioner for review.
- D. Preconstruction Testing Service: Engage a qualified independent testing agency to test glazed aluminum curtain-wall systems for compliance with specified requirements for performance and test methods. Provide test specimens and assemblies representative of proposed materials and construction.
1. Select sizes and configurations of assemblies to adequately demonstrate capability of glazed aluminum curtain-wall systems to comply with performance requirements and according to AAMA 501 recommendations.
  2. Notify Commissioner seven days in advance of the dates and times when assemblies will be constructed.
- E. Welding: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code--Aluminum."
- F. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.
1. Build mockup of typical wall area as shown on Drawings.
  2. Field testing shall be performed on mockups according to requirements in Part 3 "Field Quality Control" Article.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in DDC General Conditions. Review methods and procedures related to glazed aluminum curtain-wall systems including, but not limited to, the following:
1. Review structural load limitations.
  2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  3. Review required testing, inspecting, and certifying procedures.

## 1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for glazed aluminum curtain-wall systems by field measurements before fabrication and indicate measurements on Shop Drawings.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating glazed aluminum curtain-wall systems without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

## 1.9 WARRANTY

- A. When warranties are required, verify with Owner's counsel that special warranties stated in this Article are not less than remedies available to Owner under prevailing local laws. Coordinate with DDC General Conditions.
- B. Special Assembly Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of glazed aluminum curtain-wall systems that

do not comply with requirements or that deteriorate as defined in this Section within specified warranty period.

1. Failures include, but are not limited to, the following:
    - a. Structural failures including, but not limited to, excessive deflection.
    - b. Noise or vibration caused by thermal movements.
    - c. Deterioration of metals and other materials beyond normal weathering.
    - d. Water leakage.
    - e. Failure of operating components to function normally.
  2. Warranty Period: Two years from date of Substantial Completion.
- C. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
1. Warranty Period: 15 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for glazed aluminum curtain-wall systems is based on EFCO Corp. 5500X; 2-1/4" wide sightline x 6" deep thermal frame. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
1. Alimicor (ThermaWall 2600).
  2. EFCO Corporation (5500X).
  3. YKK AP America Inc. (750XT)

### 2.2 FRAMING SYSTEMS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
1. Sheet and Plate: ASTM B 209.
  2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221.
  3. Extruded Structural Pipe and Tubes: ASTM B 429.
  4. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.
- B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
  2. Cold-Rolled Sheet and Strip: ASTM A 611.
  3. Hot-Rolled Sheet and Strip: ASTM A 570/A 570M.

- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
  - 1. Where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
  - 2. Reinforce members as required to receive fastener threads.
  - 3. Use exposed fasteners with countersunk Phillips screw heads.
  - 4. Finish exposed portions to match framing system.
  - 5. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.
- E. Anchors: Three-way adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
  - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- F. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- G. Framing Gaskets: As recommended by manufacturer for joint type.
- H. Framing Sealants: As recommended by manufacturer for joint type and specified in Division 7 Section "Joint Sealants."

### 2.3 GLAZING SYSTEMS

- A. Glazing: As specified in Section 08 80 00 "Glazing."
- B. Glazing Gaskets: As specified in Section 08 80 00 "Glazing."
- C. Glazing Sealants: As specified in Section 08 80 00 "Glazing."

### 2.4 ACCESSORY MATERIALS

- A. Insulating Materials: Specified in Section 07 21 00 "Thermal Protection."
- B. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

### 2.5 FABRICATION

- A. Form aluminum shapes before finishing.
- B. Fabricate components that, when assembled, have the following characteristics:
  - 1. Sharp profiles, straight and free of defects or deformations.

2. Accurately fitted joints with ends coped or mitered.
  3. Internal guttering systems or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
  4. Physical and thermal isolation of glazing from framing members.
  5. Accommodations for thermal and mechanical movements of glazing and framing to prevent glazing-to-glazing contact and to maintain required glazing edge clearances.
  6. Provisions for reglazing from exterior.
- C. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- D. Factory-Assembled Frame Units:
1. Rigidly secure nonmovement joints.
  2. Seal joints watertight, unless otherwise indicated.
  3. Pressure equalize system at its interior face.
  4. Install glazing to comply with requirements in Division 8 Section "Glazing."
- E. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## 2.6 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General:
1. Comply with manufacturer's written instructions.
  2. Do not install damaged components.

3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
7. Seal joints watertight, unless otherwise indicated.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified Section 088000 "Glazing."

G. Install sealants as specified in Section 079000 "Joint Sealers."

H. Install insulation materials as specified in Section 072100 "Thermal Protection."

I. Erection Tolerances: Install glazed aluminum curtain-wall systems to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet.
2. Level: 1/8 inch in 20 feet.
3. Alignment:
  - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
  - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
  - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or greater, limit offset from true alignment to 1/4 inch.
4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

### 3.3 FIELD QUALITY CONTROL

- A. Testing Services: Testing and inspecting of representative areas to determine compliance of installed system with specified requirements shall take place as follows and in successive stages as indicated on Drawings. Do not proceed with installation of the next area until test results for previously completed areas show compliance with requirements.

1. Water Spray Test: After the installation of minimum area of 20-foot glazed aluminum curtain-wall system has been completed but before installation of interior finishes has begun, a 2-bay area of system designated by Commissioner shall be tested according to AAMA 501.2 and shall not evidence water penetration.
- B. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

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## SECTION 08 51 00

## ALUMINUM WINDOWS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the aluminum windows as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Aluminum windows.
  - 2. Miscellaneous insulation at window frames.
  - 3. Anchors, hardware and accessories including trim pieces and panning.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Joint Sealers - Section 07 90 00.
- C. Glazing – Section 08 80 00.

## 1.4 PERFORMANCE REQUIREMENTS

- A. Windows shall conform to the "Voluntary Specification for Aluminum Prime Windows & Sliding Glass Doors" as published by ANSI/AAMA 101/I.S.2-97 unless more stringent requirements are specified. Windows shall conform to minimum standards of AW60 for projected, casement and fixed windows.
- B. Performance and Testing: Except as otherwise indicated, comply with air infiltration tests, water resistance tests and applicable load tests specified in ANSI/AAMA 101/I.S.2-97 for type and classification of window units required in each case.
  - 1. Testing: Where manufacturer's standard window units comply with requirements and have been tested in accordance with specified tests, provide certification by



- manufacturer to the Commissioner showing compliance with such tests; otherwise, perform required tests through an AAMA-accredited testing laboratory or agency, and provide certified test results to the Commissioner.
2. Test reports shall be not more than four years old.
  3. Sample submitted for tests shall be manufacturer's standard construction and whose overall dimensions shall be at least the lay-out size window and window/door unit required for this Project. Sequence of test shall be optional between manufacturer and the testing laboratory except that in all cases, air infiltration test shall be performed before water resistance test. Sash in sample shall contain the approximate configuration as that of windows to be tested.
  4. To evaluate testing and measure product performance, testing shall be conducted on manufacturer's standard product glazed with type of glazing material specified herein.
- C. A thermal transmittance test and a condensation resistance test shall be conducted according to AAMA 1503-04, "Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections." Standard test conditions as specified in Section 9.1 of the 1503.1-04 shall be used. Windows shall meet the following minimum criteria:
1. Condensation Resistance Test (CRF)
    - a. With window sash and ventilators closed and locked, test unit in accordance with AAMA 1502.7.
    - b. Condensation Resistance Factor (CRF) shall be not less than 50.0 for glass and 55.0 for frame.
  2. Thermal Transmittance Test (Conductive U-Value)
    - a. With window sash and ventilators closed and locked, test unit in accordance with AAMA 1503.0.
    - b. Conductive thermal transmittance (U-value) shall be not more than 0.60 BTU/hr/sf/deg. F.
- D. Manufacturers shall have been engaged in the manufacture of aluminum windows of grades specified for not less than 3 years.
- E. Provide anchorage of window to building substrate to withstand pressure or suction winds loads per requirements of the Building Code but not less than 30psf.
- F. Life Cycle Testing: When tested in accordance with AAMA 910-93, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage which would cause the window to be inoperable at the conclusion of testing. Air infiltration and water resistance tests shall not exceed the primary performance requirements specified.
- G. Fabricate and install window to allow for thermal movement of materials when subject to a temperature differential from -30 deg. F. to +180 deg. F. without damage of any finish.
- H. Take field measurements of existing openings prior to submitting shop drawings and show same on shop drawings for each opening. Note that the Contract Drawings show general locations and sizes of windows, but the Contractor shall remain responsible for all field measurements, quantities, etc.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies
- B. Shop Drawings
1. Shop drawings shall show in detail and fully indicate the location and the quantities of all the work, the kind, finish, size, section of each unit, overall and detail dimensions, factory and field joint locations, arrangements and details, location and detail of each piece of anchorage, flashings, supporting construction provisions for the work of others.
  2. Shop drawings shall show all surrounding conditions on elevations and details, including steel, concrete, masonry, lintels, block, and anchorage; all correctly dimensioned.

3. Shop drawings of building elevations shall be at scale of 1/8" = 1'-0", or larger. Other shop drawings shall be at a scale that is normal to trade, or larger if required by Commissioner.
  4. Contract drawings may not be used (reproduced, enlarged, reduced, etc.) by Subcontractor for shop drawings.
  5. Shop drawings also shall fully demonstrate all requirements respecting the manufacture, finishing, handling, storage, carting sequence and erection of all materials specified herein.
  6. Show joinery techniques, provision for horizontal and vertical expansion, drainage and weep systems, glass and metal thicknesses and framing member profiles.
  7. Identify all materials, including metal alloys, glass types, fasteners, and glazing materials. Identify all shop and field sealants by product name and locate on drawings. Glazing details shall be at full size scale.
  8. Show dimensioned position of glass edge relative to metal rabbet.
  9. Shop drawings shall show attachments of window assemblies to adjoining construction and location of all work; kind, finish and size of frames, overall and detail dimensions, location and detail of each anchorage; supporting and adjoining construction; provision for the work of other trades; and all other required information.
  10. Contractor shall verify all measurements of existing window openings in the field before commencing fabrication.
  11. Any proposed deviations from work shown on the Contract drawings shall be indicated and so identified on shop drawings for Commissioner's review.
- C. Samples
1. Submit 12" long sample of extrusion with specified finish.
  2. Full size corner section of all types of aluminum frame, showing construction, glass and finishing - 12" x 12".
  3. Actuator.
  4. All fasteners, straps, hardware, locks and keys, sealant, etc.
- D. Submit certified test results as required herein.
- E. Guarantees as noted in 1.10.
- F. Window manufacturer and Contractor for work of this section must each submit references of prior projects similar in size, scope and window type.
- 1.6 MOCK UP
- A. Provide one full size mock up of window and actuator with all adjacent construction.

### 1.7 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

### 1.8 DELIVERY, STORAGE AND HANDLING

#### A. Protection

- 1. Materials shall be packed, loaded, shipped, unloaded, stored and protected in a manner which will avoid abuse, damage and defacement in accordance with the recommendations contained in the AAMA Aluminum Curtain Wall Manual #10 entitled "Care and Handling of Architectural Aluminum From Shop to Site."
- 2. Remove all paper type wrappings and interleavings that are wet or which could become wet when unloading materials.
- 3. Store inside structure in space designated by Commissioner.
- 4. Stack vertically or on edge so that water cannot accumulate on or within materials using wood or plastic shims between components to provide water drainage and air circulation.
- 5. Cover materials with tarpaulins or plastic hung on frames to provide air circulation and prevent contaminants from contacting aluminum.
- 6. Keep water away from stored assemblies.
- 7. The Contractor shall be responsible for taking the steps necessary to protect the materials from careless handling of tools, weld splatter, acids, roofing tar, solvents, abrasive cleaners, and other items that could damage window components and finish.

### 1.9 MANUFACTURER'S REPRESENTATIVE

- A. Contractor shall require representative of manufacturer of the windows to provide field instructions and supervision of the installation of the windows.
- B. Contractor shall require the manufacturer's representative to make sure that the subcontractor's workmen are fully instructed and trained in the handling and application of all the materials, and shall see that all the materials are correctly installed.
- C. Upon completion of the installation, the Contractor shall submit to the Commissioner in written form certification that the representative of the manufacturer of the windows has supervised the work of this Section and that all windows are correctly installed.

## 1.10 GUARANTEE

- A. Aluminum Windows and Related Materials: Ten (10) year guarantee on materials and workmanship including finish on aluminum and on glass and glazing by the manufacturer.

## PART 2 PRODUCTS

### 2.1 WINDOWS

- A. Basis of Design Product: EFCO Series 2700.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following equal to the Basis of Design product:
  - 1. EFCO
  - 2. Wausau
  - 3. YKK

### 2.2 PROJECTED, FIXED AND CASEMENT WINDOWS

- A. Aluminum Windows and Components
  - 1. Extruded aluminum prime billet 6063TS, aluminum sheet 5005 H32 (anodic) or 3003 H14
  - 2. Minimum principal window member wall thickness 1/8".
  - 3. Minimum frame and vent depth front to back 2-1/2". Vent to be flush with frame.
  - 4. Maximum exposed metal sightlines of main frame members shall be 2" at all members except 3" at horizontal intermediate between fixed and operable areas.
  - 5. Glass plane shall be recessed 1" from exterior plane of window members. Framing members shall possess a sloped profile duplicating an existing exterior putty glazed steel window profile.
  - 6. There shall be no change in exterior sightlines between fixed and operable units including spandrel areas.
  - 7. Vent sections must be tubes.
  - 8. Provide subsill (EFCO 1516) and subsill extension (EFCO 2129) for complete assembly as indicated on drawings.
- B. Hardware - General
  - 1. All steel components 300 Series stainless steel (SS) i.e. - keepers, fasteners, hold open arms, tracks, etc.
  - 2. All aluminum components 6063-T5 (T6) or 6105-T6.
  - 3. Locking handles and cases, white bronze.
  - 4. Hardware members bridging frame or vent thermal barrier to be nylon or suitable low conductivity, non-metallic material.

- C. Remote Electrical Actuator
  - 1. Provide 24VDC low voltage surface mounted actuator for remote operation, equal to Sleekline TO 2700 by EFCO or equal recommended by window manufacturer and compatible with window system and operation indicated.
- D. Thermal-Break, Frame and Vent: Factory poured in place polyurethane into prefinished cavity in manufacturer's plant providing minimum 3/8" separation.
- E. Weatherstrip: Extruded sponge neoprene meeting ASTM C509.
- F. Glass and Glazing: Shop glaze.
- G. Fabrication
  - 1. General
    - a. Finish, fabricate and shop assemble frame and sash members into complete windows under responsibility of one manufacturer.
    - b. No bolts, screws or fastenings to bridge thermal barriers or impair independent frame movement.
  - 2. Main Frame Members: Miter all corners and continuously weld along unexposed surfaces so as not to affect the structural or thermal integrity of the thermal barrier, then seal weathertight.
  - 3. Weatherstripping
    - a. Two rows (both inner and outer overlap contacts) of extruded neoprene meeting ASTM C509 in extruded races about perimeter of operating sash.
    - b. Securely stake and join at corners.
  - 4. Glass Drainage: Provision shall be made to insure that water will not accumulate and remain in contact with the perimeter areas of sealed insulating glass.
  - 5. Hardware
    - a. Hinges
      - 1). Each operating sash shall be provided with a minimum of two extruded aluminum, three knuckle hinges with stainless steel pins. Windows over 4'-4" in height shall be provided with an intermediate hinge.
      - 2). The hinge shall be attached to both the frame and sash with concealed fasteners. The hinge shall be furnished to match the window.
    - b. Locks
      - 1). Each operating sash shall be provided with a minimum of one die cast locking handle up to a ventilator height of 4'-0" and two locking handles on vents over 4'-0" high.
      - 2). All locking hardware shall be provided with a stainless steel strike backed up with an extruded aluminum leg a minimum of .125" in thickness. Locking directly against aluminum, will not be accepted.
    - c. Riser Blocks: Each operating vent shall be equipped with a nylon riser block at the sill.

### 2.3 GLASS

- A. For glass and glazing, refer to Section 08 80 00.

### 2.4 GASKETS / WEATHERSTRIPPING

- A. All gaskets / weatherstripping shall be neoprene, except where used in contact with a silicone sealant. In contact with silicone sealants, gaskets and spacers shall be preformed heat cured silicone rubber, chemically compatible with the silicone sealant and suitable for the specific purpose intended or equal, as recommended by the sealant manufacturer and approved by the Commissioner. All gaskets / weatherstripping/spacers shall have continuous mechanical engagement to framing members; adhesive attachment is not acceptable. All weatherstrips and gaskets shall be continuous with vulcanized/molded corners where possible.
- B. Sponge gaskets / weatherstripping/spacers shall be extruded black neoprene or silicone rubber (or equal as provided for in 2.04 A) with a hardness of 40 + 5 durometer Shore A and conform to ASTM C-509-79 (for neoprene). Sponge gaskets shall be compressed 20% to 35% in the final installed position.
- C. Dense gaskets / weatherstripping shall be extruded black neoprene conforming to NAAMM SG-1-70 or silicone rubber (or equal as provided for in 2.04 A) with a hardness of 75 + 5 durometer Shore A for hollow profiles and 60 + 5 for solid profiles.

### 2.5 SEALANTS (NON-STRUCTURAL)

- A. All joints, which are sealed with sealant as part of the fabrication or erection procedure, shall be sealed with an approved butyl (concealed) or low modulus silicone (exposed or concealed) sealant in color to match the adjoining surfaces or as may be required by the Commissioner. All perimeter sealant (metal to adjacent construction) shall be low or medium modulus silicone sealant. Silicone sealant shall be as manufactured by General Electric, Dow Corning or Pecora. Butyl sealant shall be PTI 707.
- B. In using specified sealants, strictly observe the printed instructions of sealant manufacturer regarding joint size, limitations, backer rod, mixing, cleaning, surface preparation, priming and application. A primer shall be used, unless printed instructions advise to the contrary, and sealant manufacturer certifies that the use thereof will reduce its performance. Sealant shall not be applied when substrates are wet or when the temperature is below 40 deg. F.
- C. Care shall be exercised to insure against "Three Surface Adhesion". Bond breakers shall be provided where necessary.
- D. Contractor shall provide certification from sealant manufacturer that the sealant manufacturer has reviewed all sealant details and finds same suitable for the purpose intended, compatible with and will not stain the surfaces with which they are in contact. Statement as to compatibility, adhesion sufficiency and non-staining shall be accompanied by actual test results on production substrates performed in accordance with applicable ASTM procedures.

### 2.6 FINISH OF ALUMINUM

- A. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

## PART 3 EXECUTION

### 3.1 INSPECTION AND REMOVALS

- A. Examine surfaces and conditions where aluminum windows are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.
- B. Verify dimensions taken at the job site affecting the work. Bring field dimensions which are at variance to the attention of the Commissioner. Obtain decision regarding corrective measures before the start of installation.

### 3.2 INSTALLATION

- A. Use only skilled tradesman with work done in accordance with approved Shop Drawings and specifications.
- B. Plumb and align window faces in a single plane for each wall plane and erect windows and materials square and true adequately anchored to maintain positions permanently when subjected to normal thermal and building movement and specified wind loads.
- C. Adjust windows for proper operation after installation.
- D. Furnish and apply sealants to provide a weathertight installation at all metal-to-metal joints and intersections of frames and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.
- E. Aluminum shall be insulated from direct contact with steel, masonry, concrete, or non-compatible materials by bituminous paint, zinc chromate primer, or other suitable insulation material.
- F. Blanket insulation shall be installed behind aluminum covers, panning and trim to insure thermally insulated seal.

### 3.3 ADJUSTING AND CLEANING

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, etc.
- B. Glass that is broken, damaged, cracked, or permanently stained shall be replaced.
- C. Final cleaning of finish shall be in accordance with AAMA 610.1.

END OF SECTION



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## SECTION 08 63 10

## POLYCARBONATE-INSULATING-PANEL SKYLIGHTS

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the aluminum entrances and storefronts as indicated on the drawings and/or specified herein including the following:
  - 1. Sealed assemblies at Young Adult Room and Interior Court.
  - 2. Sealed assembly at Main Entry.
  - 3. Laylight at Interior Court.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Structural Steel Framing – 05 12 00.
- C. Metal Fabrications - Section 05 50 00.
- D. Flashing and Sheet Metal – 07 62 00.
- E. Joint Sealers - Section 07 90 00.

## 1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide skylights capable of withstanding loads and thermal and structural movements indicated without failure. Failure includes the following:

1. Supporting-frame deflection exceeding specified limits.
  2. Polycarbonate-insulating-panel deflection exceeding manufacturer's recommended limits or causing panel failure.
  3. Thermal stresses transferred to the building structure.
  4. Noise or vibration created by thermal and structural movement and wind.
  5. Loosening or weakening of fasteners, attachments, and other components.
  6. Sealant failure.
- B. Supporting-Frame-Member Deflection Limits: As follows:
1. Deflection of the entire length of framing members in direction normal to the skylight plane is limited to 1/180, unless otherwise indicated.
  2. Deflection of the entire length of framing members for spans exceeding 20 feet is limited to 1/240 of clear span.
- C. Structural Loads: Provide skylights, including anchorage, capable of withstanding the effects of the following design loads when supporting full dead loads:
1. Wind Loads: As per NYC Code.
  2. Snow Loads: As per NYC Code.
  3. Roof Loads: As follows:
    - a. Concentrated Load: 300 lbf applied to skylight at location that produces the most severe stress or deflection.
    - b. Live Load: As per NYC Code.
  4. Seismic Loads: As per NYC Code.
- D. Thermal Movement: Provide skylights that allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, sealant failure, and other detrimental effects.
1. Temperature Change (Range): 120 deg F ambient; 180 deg F material surfaces.
- E. Air Infiltration: Provide skylights with maximum air leakage of 0.06 cfm/sq. ft. of surface when tested according to ASTM E 283.
- F. Water Penetration: Provide skylights that do not evidence water penetration when tested according to ASTM E 331 at a minimum static pressure differential of 20 percent of positive design wind load.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 18 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:

- a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Include construction details, material descriptions, dimensions, profiles, and finishes of skylight components.
- C. Shop Drawings: For skylights, include plans, elevations, sections, details, and attachments to other Work.
1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Samples for Initial Selection: Manufacturer's color charts consisting of sections of units showing the full range of colors available for the following:
1. Factory-finished aluminum.
  2. Polycarbonate insulating panels.
- E. Samples for Verification: For each exposed finish required, in same thickness and material indicated for the Work and in size indicated below. If finishes involve normal color variations, include sample sets consisting of two or more units showing the full range of variations expected.
1. Factory-Finished Aluminum: 12-inch long sections.
  2. Polycarbonate Insulating Panels: 12-inch square units.

- F. Cutaway Sample: Of framing intersection, made from 12-inch long lengths of full-size components and showing details of the following:
  - 1. Primary framing members.
  - 2. Joinery.
  - 3. Expansion provisions.
  - 4. Polycarbonate insulating panels.
  - 5. Methods of drainage.
- G. Installer Certificates: Signed by manufacturer certifying that installers comply with requirements.
- H. Field Test Reports: Indicate and interpret test results for compliance with requirements.
- I. Product Test Reports: From a qualified testing agency indicating skylights comply with requirements, based on comprehensive testing of current products.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer to assume engineering responsibility who has specialized in installing skylights similar to those indicated for this Project and who is properly trained by the manufacturer.
  - 1. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of skylights that are similar to those indicated for this Project in material, design, and extent.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

- D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of skylights. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including testing or in-service performance.
- E. Product Options: Drawings indicate size, profiles, and dimensional requirements of skylights and are based on ExTech products as indicated. Other manufacturers' skylight systems that comply with requirements may be considered. Refer to DDC General Conditions.
1. Do not modify intended aesthetic effects, as judged solely by Commissioner, except with Commissioner's approval. If modifications are proposed, submit comprehensive explanatory data to Commissioner for review.
- F. Insulating-Panel Fire-Test-Response Characteristics: Provide polycarbonate insulating panels identical to those tested for the following fire-test-response characteristics per test method indicated below by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
1. Plastic Self-Ignition Temperature: 650 deg F or more when tested per ASTM D 1929.
  2. Interior-Face Burning Extent: 1 inch or less per ASTM D 635.
  3. Interior-Face Surface Burning: Flame-spread and smoke-developed ratings of not more than 25 and 450, respectively, per ASTM E 84.
  4. Exterior-Face Surface Burning: Class A, burning brand only, per ASTM E 108.
- G. Mockups: Before installing skylights, build mockups for each form of construction and finish required to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Commissioner.
  2. Notify Commissioner seven 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 fabrication.
  5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  6. Demolish and remove mockups when directed.
  7. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in DDC General Conditions. Review methods and procedures related to skylights including, but not limited to, the following:
1. Inspect and discuss condition of preparatory work performed by other trades.
  2. Review structural load limitations.
  3. Review skylight curb structural requirements.
  4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
  5. Review required testing procedures.

6. Review weather and forecasted weather conditions and procedures for unfavorable conditions.
7. Review protection of adjacent roof areas.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Where skylights are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating skylights without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Commissioner of other rights Commissioner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of skylights that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
  1. Structural failures.
  2. Deterioration of metals, metal finishes, polycarbonate insulating panels, and other materials beyond normal weathering.
  3. Water leakage, defined as uncontrolled water appearing on normally exposed interior surfaces of skylights from sources other than condensation. Water controlled by flashing and gutters and drained back to the exterior and that cannot damage adjacent materials or finishes is not water leakage.
  4. Warranty Period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements below, provide products by one of the following:
  1. Extech Exterior Technologies Inc.;
  2. Duo-Gard Industries Inc.;
  3. CPI International; or approved equal.

2.2 MATERIALS AND PRODUCTS

- A. Aluminum: Alloy and temper recommended by manufacturer for use and finish indicated, and as follows:
  - 1. Extrusions: ASTM B 221.
  - 2. Sheet and Plate: ASTM B 209.
  - 3. Bars, Rods, and Wire: ASTM B 211.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum units.
- C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing; compatible with adjacent materials.
- D. Exposed Flashing and Closures: Aluminum sheet, minimum 0.060 inch thick.
- E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories; compatible with adjacent materials.
  - 1. Movement Joints: Provide slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.
  - 2. Aluminum-Retaining-Cap Fasteners: ASTM A 193/A 193M, Series 300 stainless-steel screws; type as recommended by manufacturer.
  - 3. Connections to Supporting Structure: ASTM A 307, zinc-coated steel fasteners.
  - 4. Anchor Bolts: ASTM A 307, Grade A, zinc-coated steel anchor bolts.
  - 5. Concrete or Masonry Inserts: Zinc-coated cast-iron, malleable-iron, or steel inserts; hot-dip galvanized according to ASTM A 123.
  - 6. Shims: Nonstaining, nonferrous shims compatible with adjacent materials, for installing and aligning skylight.
- F. Skylight-System Gaskets and Joint Fillers: Manufacturer's standard permanent gaskets and joint fillers for sliding, compression, and nonmoving joints.
- G. Skylight-System Sealants: Compatible with components with which sealants come in contact and recommended by skylight and sealant manufacturers for this use.
- H. Bituminous Paint: Cold-applied asphalt mastic paint complying with SSPC-Paint 12, except containing no asbestos, and formulated for 30-mil thickness per coat.
- I. Thermal Insulation: As specified in Section 07 21 00.

### 2.3 FRAMED MONUMENTAL POLYCARBONATE SKYLIGHT SYSTEM (PL3)

- A. Extruded aluminum framed, sealed skylight system glazed with polycarbonate sheet with cellular cross section that provides isolated airspaces and that is coextruded with a UV-protective layer.
  - 1. Basis of Design Product: ExTech Series 3700 Sunliter DIA.
  - 2. Provide single sheet, seven layer X-wall, 1.0 inch thick and with a U-value of not more than 0.24 Btu/sq. ft. x h x deg F per ASTM C 236.
  - 3. Extruded aluminum rafter sections with structural steel tube inserts as needed to satisfy structural criteria.



4. Impact Resistance: No failure at impact of 220 ft. x lbf according to free-falling ball impact test using a 3-1/2-inch diameter, 6.3-lb ball.
5. Color Stability: Not more than 3.0 units Delta E after 60 months when tested according to ASTM D 2244.
6. Light Transmission: 69%; 6 percent maximum decrease after 10 years according to ASTM D 1003.
7. Color: Clear.

#### 2.4 NON-THERMALLY BROKEN POLYCARBONATE CANOPY SYSTEM (PL2)

- A. Extruded aluminum framed, non-thermally broken canopy system glazed with polycarbonate sheet with cellular cross section that provides isolated airspaces and that is coextruded with a UV-protective layer.

1. Basis of Design Product: ExTech Series 3100.
2. Provide single sheet, seven layer X-wall, 1.0 inch thick per ASTM C 236.
3. Extruded aluminum rafter sections as indicated on drawings.
4. Impact Resistance: No failure at impact of 220 ft. x lbf according to free-falling ball impact test using a 3-1/2-inch diameter, 6.3-lb ball.
5. Color Stability: Not more than 3.0 units Delta E after 60 months when tested according to ASTM D 2244.
6. Light Transmission: 69%; 6 percent maximum decrease after 10 years according to ASTM D 1003.
7. Color: Clear.

#### 2.5 POLYCARBONATE LAYLIGHT PANEL (PL1)

- A. Polycarbonate sheets with cellular cross section that provides isolated airspaces and that is coextruded with a UV-protective layer.

1. Provide single sheet, triple-wall, 0.75 inch thick.
2. Support system of steel channel framing system and aluminum components as indicated on drawings and per 05 50 00 Metal Fabrications.
3. Edge supported by aluminum angle and steel framing system.
4. Color Stability: Not more than 3.0 units Delta E after 60 months when tested according to ASTM D 2244.
5. Light Transmission: 69%; 6 percent maximum decrease after 10 years according to ASTM D 1003.
6. Color: Clear.

- B. Glazing Gaskets: Manufacturer's standard pressure-glazing gaskets of elastomer type and hardness selected by skylight and gasket manufacturers to comply with requirements.

#### 2.6 FABRICATION

- A. Framing Components: As follows:

1. Fabricate components that, when assembled, will have accurately fitted joints with ends coped, mitered, or butted to produce hairline joints free of burrs and distortion.
  2. Fabricate components to drain water passing joints and to drain condensation and moisture occurring or migrating within skylight system to the exterior.
  3. Fabricate components to accommodate expansion, contraction, and field adjustment and to provide for minimum clearance and shimming at skylight perimeter.
  4. Fabricate components to ensure that polycarbonate insulating panels are thermally and physically isolated from framing members.
  5. Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
  6. Fit and assemble components to greatest extent practicable before finishing.
  7. Reinforce members as required to retain fastener threads.
  8. Where fasteners are exposed to view from interior, countersink fastener heads and finish them to match framing.
  9. Before shipping, shop assemble, mark, and disassemble components that cannot be permanently shop assembled.
- B. Fabricate flashing with weatherproof expansion joints and corners.
- C. Prepare framing to receive anchor and connection devices and fasteners.

## 2.7 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C. Class I, Clear Anodic Finish: AA-M10C22A41 (Mechanical Finish: as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 607.1.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, 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.

### 3.2 PREPARATION

- A. Furnish anchor bolts and inserts for setting in concrete formwork or masonry indicated to support skylights.
- B. Metal Protection: As follows:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
3. Where aluminum will contact pressure-treated wood, separate dissimilar materials by methods recommended by manufacturer.

### 3.3 INSTALLATION

- A. General: Comply with manufacturer's written instructions for protecting, handling, and installing skylight components.
1. Fit frame joints to produce hairline joints free of burrs and distortion.
  2. Rigidly secure nonmovement joints.
  3. Accommodate thermal and mechanical movements.
  4. Install framing components to drain water passing joints and to drain condensation and moisture occurring or migrating within skylight system to the exterior.
  5. Coordinate installation of insulation and flashings at skylight perimeters to maintain continuity of thermal and water barriers.
  6. Set continuous flashings in a full sealant bed, unless otherwise indicated. Comply with requirements in Section 079000 "Joint Sealers."
- B. Erection Tolerances: Install skylight components true in plane, accurately aligned, and without warp or rack. Adjust framing to comply with the following tolerances:
1. Variation from Plane: Limit variation from plane or location shown to 1/8 inch in 10 feet; 1/4 inch over total length.
  2. Alignment: Where surfaces abut in line and at corners and where surfaces are separated by less than 3 inches, limit offset from true alignment to less than 1/32 inch; otherwise, limit offset from true alignment to 1/8 inch.
- C. Install sealants according to sealant manufacturer's written instructions to provide weatherproof joints. Install joint fillers behind sealant as recommended by sealant manufacturer.

### 3.4 FIELD QUALITY CONTROL

- A. Water-Spray Test: Test skylights according to procedures in AAMA 501.2.
- B. Repair or replace Work that does not pass testing or that is damaged by testing; and retest Work.

### 3.5 CLEANING

- A. Clean skylights inside and outside, immediately after installation, according to manufacturer's written recommendations.

1. Remove temporary protective coverings and strippable coatings from factory-finished metal surfaces and polycarbonate insulating panels. Remove labels and markings from all components.

END OF SECTION

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SECTION 08 71 00

FINISH HARDWARE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum to the General Conditions and (5) the Contract.

1.2 SECTION INCLUDES

- A. Section includes furnishing and installation of door hardware for doors specified in "Hardware Sets" and required by actual conditions. Including screws, bolts, expansion shields, electrified door hardware, and other devices for proper application of hardware.
- B. Where items of hardware are not specified and are required for intended service, such omission, error or other discrepancy shall be submitted to Commissioner.

1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Carpentry - Section 06 20 00.
- C. Steel doors and frames - Section 08 71 00.
- D. Wood doors – Section 08 14 00.
- E. Access doors and panels – Section 08 31 00.
- F. Aluminum Entrance and Storefront – Section 08 41 00.
- G. Glazed Aluminum Curtain Walls – Section 08 44 13.
- H. Glass and glazing - Section 08 11 13.
- I. Gypsum drywall – Section 09 26 00.
- J. Painting - Section 09 90 00.
- K. Floor Mats and Frames – Section 12 48 14.
- L. Low voltage electrical – Section 26 05 19.

## 1.4 REFERENCES

- A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI):
  - 1. ANSI/BHMA A156.1 Butts & Hinges (2006)
  - 2. ANSI/BHMA A156.2 Bored & Preassembled Locks & Latches (2003)
  - 3. ANSI/BHMA A156.4 Door Controls – Closers (2000)
  - 4. ANSI/BHMA A156.6 Architectural Door Trim (2005)
  - 5. ANSI/BHMA A156.7 Template Hinge Dimensions (2003)
  - 6. ANSI/BHMA A156.8 Door Controls – Overhead Stops and Holders (2005)
  - 7. ANSI/BHMA A156.16 Auxiliary Hardware (2002)
  - 8. ANSI/BHMA A156.18 Materials & Finishes (2006)
  - 9. ANSI/BHMA A156.21 Thresholds (2006)
  - 10. ANSI/BHMA A156.22 Door Gasketing Systems (2005)
  - 11. ANSI/BHMA A156.28 Keying Systems (2008)
  - 12. ANSI/BHMA A250.13 Testing and Rating of Severe Windstorm Resistant Components for Swinging Door Assemblies
- B. International Code Council/American National Standards Institute (ICC/ANSI):
  - 1. ICC/ANSI A117.1 Standards for Accessible and Usable Buildings and Facilities (2003).
- C. Underwriters Laboratories, Inc. (UL):
  - 1. UL 10C Positive Pressure Fire Test of Door Assemblies
  - 2. UL 1784 Air Leakage Test of Door Assemblies
- D. Door and Hardware Institute (DHI):
  - 1. DHI Publication – Keying Systems and Nomenclature
  - 2. DHI Publication – Abbreviations and Symbols
  - 3. DHI Publication – Installation Guide for Doors and Hardware
  - 4. DHI Publication – Sequence and Format of Hardware Schedule
- E. National Fire Protection Agency (NFPA)
  - 1. NFPA 70 National Electrical Code (2011)
  - 2. NFPA 80 Standard for Fire Doors and Other Opening Protectives (2010)
  - 3. NFPA 101 Life Safety Code (2009)
  - 4. NFPA 105 Standard for the Installation of Smoke Door Assemblies (2010)
- F. Building Codes
  - 1. 2008 NYC Building Code
  - 2. Local Building Code

## 1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- C. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
  3. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    - e. Explanation of abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for door hardware.
    - g. Door and frame sizes and materials.
  4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- D. Product Data: Submit manufacturer's data for each item of hardware. Include whatever information may be necessary to show compliance with requirements.
- E. Samples: Prior to submittal of the final hardware schedule and prior to delivery of hardware, submit three (3) sample of each exposed hardware unit. Sample will be reviewed by the Commissioner for design, color and texture only. Compliance with other requirements is the exclusive responsibility of the construction manager. Samples approved by the Commissioner shall be turned over to the Commissioner. Approved samples may be installed in the work after substantial completion of work. Each sample set shall include one (1) each of the following samples:
- a. Hinge (each type)
  - b. Intermediate Pivot
  - c. Surface Closer
  - d. Lockset (office function)
  - e. Floor Stop
- F. Wiring Diagrams: Supplier shall furnish riser diagrams, wiring diagrams and point to point diagrams for all electrical hardware specified herein. These diagrams shall be included with the initial draft of the hardware schedule.
- G. Keying Schedule: Prepared under the supervision of the Commissioner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Commissioner to approve submitted keying schedule prior to the ordering of permanent cylinders.



- H. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in DDC General Conditions. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
- I. Warranties and Guarantee Service: Special warranties and service agreements specified in this Section.

## 1.6 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 3 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 3 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor and Commissioner concerning both standard and electromechanical door hardware and keying.
  - 1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- D. Source Limitations: Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier unless otherwise indicated.
  - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
  - 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- E. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:
  - 1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

2. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
    - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
    - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
      - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
      - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
    - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
  3. NFPA 101: Comply with the following for means of egress doors:
    - a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
    - b. Thresholds: Not more than 1/2 inch high.
  4. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
    - a. Test Pressure: Positive pressure labeling.
- F. Keying Conference: Conduct conference to comply with requirements in DDC General Conditions. Keying conference to incorporate the following criteria into the final keying schedule document:
1. Function of building, purpose of each area and degree of security required.
  2. Plans for existing and future key system expansion.
  3. Requirements for key control storage and software.
  4. Installation of permanent keys, cylinder cores and software.
  5. Address and requirements for delivery of keys.
- G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in DDC General Conditions with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
1. Prior to installation of door hardware, arrange for manufacturers' representatives to hold a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.

2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
  3. Review sequence of operation narratives for each unique access controlled opening.
  4. Review and finalize construction schedule and verify availability of materials.
  5. Review the required inspecting, testing, commissioning, and demonstration procedures
- H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Commissioner via registered mail or overnight package service. Instructions for delivery to the Commissioner shall be established at the "Keying Conference".
- D. Waste Management and Disposal
  1. Separate waste materials for reuse or recycling in accordance with DDC General Conditions.

#### 1.8 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

## 1.9 WARRANTY

- A. General Warranty: Reference DDC General Conditions. Special warranties specified in this Article shall not deprive The City of New York of other rights The City of New York may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Commissioner. Failures include, but are not limited to, the following:
1. Structural failures including excessive deflection, cracking, or breakage.
  2. Faulty operation of the hardware.
  3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
1. Ten years for mortise locks and latches.
  2. Ten years for extra heavy duty cylindrical (bored) locks and latches.
  3. Seven years for heavy duty cylindrical (bored) locks and latches.
  4. Five years for standard duty cylindrical (bored) locks and latches.
  5. Five years for exit hardware.
  6. Twenty five years for manual door closers.
  7. Two years for electromechanical door hardware.

## 1.10 GUARANTEE SERVICE

- A. Guarantee Tools and Instructions: Furnish a complete set of specialized tools and guarantee service instructions as needed for Commissioner's continued adjustment, guarantee service, and removal and replacement of door hardware.
- B. Continuing Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full guarantee including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
  - a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
2. Products furnished, but not installed, under this Section include the following. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.
  - a. Permanent cylinders, cores, and keys to be installed by Commissioner.
- B. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in DDC General Conditions. Approval of requests is at the discretion of the Commissioner.

## 2.2 HINGES

- A. Hinges shall be of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Standards: Products to be certified by the following:
  1. Hinges: ANSI/BHMA A156.1
  2. Template Hinge Dimensions: ANSI/BHMA A156.7
  3. Self Closing Hinges: ANSI/BHMA A156.26
- C. Butt Hinges:
  1. Hinge weight and size unless otherwise indicated in hardware sets:
    - a. Doors up to 36" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .134" and a minimum of 4-1/2" in height.
    - b. Doors from 36" wide up to 42" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .145" and a minimum of 5" in height.
    - c. For doors from 42" wide up to 48" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .180" and a minimum of 5" in height.
    - d. Doors greater than 1-3/4" thick provide hinges with a minimum thickness of .180" and a minimum of 5" in height.
    - e. Width of hinge is to be minimum required to clear surrounding trim.
  2. Base material unless otherwise indicated in hardware sets:
    - a. All Doors: 304 Stainless Steel.
  3. Quantity of hinges per door:
    - a. Doors up to 60" in height shall have 2 hinges.
    - b. Doors 60" up to 90" in height shall have 3 hinges.
    - c. Doors 90" up to 120" in height shall have 4 hinges.
    - d. Doors over 120" in height add 1 additional hinge per each additional 30" in height.
    - e. Dutch doors shall have 4 hinges.

4. Hinge design and options unless otherwise indicated in hardware sets:
  - a. Hinges are to be of a square corner five-knuckle design, flat button tips and have ball bearings unless otherwise indicated in hardware sets.
  - b. Out-swinging exterior and out-swinging access controlled doors shall have non-removable pins (NRP) to prevent removal of pin while door is in closed position.
  - c. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
  - d. Provide mortar boxes for frames that require any electrically modified hinges if not an integral part of frame.
  - e. When shims are necessary to correct frame or door irregularities, provide metal shims only.
  
5. Acceptable Manufacturers for Standard Weight Brass/Stainless:
  - a. Hager Companies (HA): BB1191
  - b. Bommer Industries (BO): BB5002
  - c. McKinney (MK): TA2314
  
- D. Continuous Geared Hinges:
  1. Hinge weight and size requirements unless otherwise indicated in hardware sets:
    - a. Choose proper weight of hinge according to manufacturer's recommendations taking into consideration weight of door, weight of finish hardware applied to door, location and frequency of usage.
    - b. Size of hinge to be 1" less door height.
  
  2. Base material: Anodized aluminum manufactured from 6063-T6 material, unexposed working metal surfaces shall be coated with TFE dry lubricant
  
  3. Bearings:
    - a. Vertical loads shall be carried on Lubriloy RL bearings or approved equal for non Fire Rated doors.
    - b. Standard weight hinges shall have a minimum spacing between bearings of 5-1/8". Typical door from 80" to 84" in height to have a minimum of 16 bearings.
    - c. Heavy Weight hinges shall have a minimum spacing between bearings of 2-9/16". Typical door from 80" to 84" in height to have a minimum of 32 bearings.
  
  4. Hinge Design and Options:
    - a. Electric Through Wire (ETW) shall have appropriate number of wires to transfer power through door frame to door for proper connection of finish hardware. Provide ETW in a form that can be removed for connection, servicing without removing entire hinge from door and frame, and certified to handle an amperage rating of 3.5AMPS/continuous duty with 16.0AMPS/intermittent duty.
    - b. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
    - c. Fire rated hinges shall carry UL certification, up to and including 90-minute applications for wood doors and up to 3-hour applications for metal doors.
  
  5. Acceptable Manufactures (Heavy Duty Concealed):

- a. Hager Companies (PA): 780-224HD
  - b. Select (SL): SL-24HD
  - c. Pemko (PE): FMHD
- E. Pivots:
1. Provide quantities and types of pivots (offset, intermediate and center) as required to suit door sizes and weights.
  2. Pivot sets (offset and center) shall consist of top and bottom pivots, unless otherwise indicated.
  3. Acceptable Manufacturers (Heavy Duty Offset):
    - a. Stanley: 327
    - b. Rixon
    - c. Ives

### 2.3 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified automatic, self-latching, and manual flush bolts and surface bolts. Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor. Furnish dust proof strikes for bottom bolts. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
1. Acceptable Manufacturers:
    - a. Hager Companies (HA)
    - b. Rockwood Manufacturing (RO).
    - c. Trimco (TC).
- B. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified below or in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
1. Push/Pull Plates: Minimum .050 inch thick, 4-inches wide by 16-inches high, with square corners and beveled edges, secured with exposed screws unless otherwise indicated.
  2. Straight Pull Design: Minimum 1-inch round diameter stainless steel bar or tube stock pulls with 2 1/2-inch projection from face of door unless otherwise indicated.
  3. Offset Pull Design: Minimum 1-inch round diameter stainless steel bar or tube stock pulls with 2 1/2-inch projection and offset of 90 degrees unless otherwise indicated.
  4. Push Bars: Minimum 1-inch round diameter horizontal push bars with minimum clearance of 2 1/2-inch projection from face of door unless otherwise indicated.
  5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
  6. Acceptable Manufacturers:
    - a. Rockwood Manufacturing (RO).
    - b. Trimco (TC).

## 2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum three years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices where possible. Where not possible because the noted manufacturer does not make the specified device, ensure that the keyed cylinder is compatible with the different manufacturer's lockset and exit device.
1. Acceptable Manufacturer:
    - a. Best Access Systems / Stanley Security Systems (BS)
- C. Cylinders: Original manufacturer cylinders complying with the following:
1. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
  2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
  3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
  4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
- D. Keying System: Each type of lock and cylinders to be factory keyed. Conduct specified "Keying Conference" to define and document keying system instructions and requirements. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Commissioner. Incorporate decisions made in keying conference, and as follows:
1. Master Key System: Cylinders are operated by a change key and a master key.
  2. Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.
  3. Great-Grand Master Key System: Cylinders are operated by a change key, a master key, a grand master key, and a great-grand master key.
  4. Existing System: Master key or grand master key locks to Commissioner's existing system.
  5. Keyed Alike: Key all cylinders to same change key.
- E. Key Quantity: Provide the following minimum number of keys:
1. Top Master Key: One (1)
  2. Change Keys per Cylinder: Two (2)
  3. Master Keys (per Master Key Group): Two (2)
  4. Grand Master Keys (per Grand Master Key Group): Two (2)
  5. Construction Control Keys (where required): Two (2)
  6. Permanent Control Keys (where required): Two (2)
- F. Construction Keying: Provide construction master keyed cylinders or temporary keyed construction cores where specified. Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores. Furnish permanent cores for installation as directed under specified "Keying Conference".



- G. Key Registration List: Provide keying transcript list to Commissioner's representative in the proper format for importing into key control software.

## 2.5 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified mortise locksets furnished in the functions as specified in the Hardware Sets. Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body. Lockset trim (including knobs, levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.

- 1. Acceptable Manufacturer:

- a. Best Access Systems (BS) – 40H Series or approved equal

- B. Narrow Case Locksets: ANSI/BHMA 156.13 Series 1000 Grade 1 certified narrow case deadlocks for swinging or sliding door applications. All functions shall be manufactured in a single sized case formed from 12 gauge minimum, corrosion resistant steel (option for fully stainless steel case and components). Provide minimum 2 7/8" throw laminated stainless steel bolt. Bottom rail deadlocks to have 3/8" diameter bolts. Provide cylinders compatible with Best Access Systems (BAS) keying.

- 1. Acceptable Manufacturers:

- a. Adams Rite Manufacturing (AD) – MS 1805S / MS1950 Series or approved equal

- C. Lock Trim Design: As specified in Hardware Sets.

## 2.6 AUXILIARY LOCKS

- A. Mortise Deadlocks, Large Case: ANSI/BHMA A156.13, Series 1000, Grade 1, certified large case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. One piece stainless steel bolts with a 1" throw. Deadlocks to be products of the same source manufacturer and keyway as other locksets.

- 1. Acceptable Manufacturer:

- a. Best Access Systems (BS) – 49H Series

- B. Narrow Case Deadlocks: ANSI/BHMA 156.13 Series 1000 Grade 1 certified narrow case deadlocks for swinging or sliding door applications. All functions shall be manufactured in a single sized case formed from 12 gauge minimum, corrosion resistant steel (option for fully stainless steel case and components). Provide minimum 2 7/8" throw laminated stainless steel bolt. Bottom rail deadlocks to have 3/8" diameter bolts. Provide cylinders compatible with Best Access Systems (BAS) keying.

- 1. Acceptable Manufacturers:

- a. Adams Rite Manufacturing (AD) –MS1950 Series / 451 0 Series
- C. Electromagnetic Lock: ANSI/BHMA A156.23 Grade 1 certified 1,000 pound rating (UL 1034). Fail-safe, instant-release circuit. Surface-mounted, intended for exterior tamper-proof use, clear anodized aluminum cover. Dual voltage, low power consumption (no more than 3W); UL listed device. Shall release when contact switch in exit device is triggered, or when authorized via security card reader or remote access. Electromagnet to be secured to frame and armature plate attached to door. Provide offset strike.
1. Acceptable Manufacturers:
    - a. Locknetics / Schlage (SC) – M450 Series.
    - b. Securitron (SE) - M62 Series.
    - c. Dorma (DO) – EM 5300 Series.
- D. Electric Strike: ANSI/BHMA A156.31 Grade 1 certified low-profile electric strike for exit devices and mortise lockset. Static strength rated for 1,500 lbs; UL 1034 burglary-resistant listed and suitable for outdoor use. Fail-secure. Dual voltage, low power consumption (no more than 3W); UL listed device. Shall release when contact switch in exit device is triggered, or when authorized via security card reader or remote access. Provide faceplates and mounting hardware to complete assembly.
1. Acceptable Manufacturers:
    - a. Von Duprin (VD) - 6000 Series.

## 2.7 CONVENTIONAL EXIT DEVICES

- A. Conventional Drop Bar Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device crossbars to be seamless assemblies of brass, bronze, or stainless steel construction with a minimum thickness of .065". Crossbars lever arms to be drop forged and counter balanced by springs in both the center and hinge style cases.
1. Acceptable Manufacturer:
    - a. Von Duprin (VD) – 55 Series

## 2.8 DOOR CLOSERS

- A. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units and high impact, non-corrosive plastic covers standard.
1. Acceptable Manufacturers:
    - a. Corbin Russwin Hardware (RU) - DC8000 Series.
    - b. Sargent Manufacturing (SA) - 351 Series.

- c. Norton Door Controls (NO) - 7500 Series.
  - d. Yale Locks and Hardware (YA) - 4400 Series.
- B. Door Closers, Surface Mounted (Unitrol): ANSI/BHMA 156.4, Grade 1 certified surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Unitrol arms to have door stop mechanism to absorb dead stop shock on arm and top hinge. Hold-open arms to have a spring loaded mechanism in addition to shock absorber assembly. Arms to be provided with rigid steel main arm and secondary arm lengths proportional to the door width. Provide high impact, non-corrosive plastic covers standard.
- 1. Acceptable Manufacturers:
    - a. Corbin Russwin Hardware (RU) - Unitrol DC8000 Series.
    - b. Norton Door Controls (NO) - Unitrol 7500 Series.
    - c. Yale Locks and Hardware (YA) - Unitrol 4400 Series.

## 2.9 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
- 1. Acceptable Manufacturers:
    - a. Rockwood Manufacturing (RO).
    - b. Trimco (TC).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
- 1. Acceptable Manufacturers:
    - a. Rixson Door Controls (RF).
    - b. Rockwood Manufacturing (RO).
    - c. Sargent Manufacturing (SA).

## 2.10 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
  - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: :Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
  - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Contractor shall confirm threshold compatibility with entrance mats at entrance doors. Top of threshold shall be flush and continuous with exposed surface of entrance mat. Refer to architectural details and Section 12 48 14 Floor Mats and Frames.
- G. Acceptable Manufacturers:
  - 1. Pemko Manufacturing (PE).
  - 2. Reese Enterprises, Inc. (RS).
  - 3. Zero International (ZE).

## 2.11 SILENCERS

- A. Where smoke, light, or weather seal are not required, provide three silencers per single door frame, two per double door frame and four per Dutch door frame.
- B. Acceptable Manufactures:
  - 1. Hager Companies: 307D
  - 2. Rockwood: 608
  - 3. Trimco: 1229A

## 2.12 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify Commissioner of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

## 3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

## 3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
  - 1. Installers are to be trained by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
  - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
  - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
  - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Power Operator products and accessories are required to be installed through current members of the manufacturer's "Power Operator Preferred Installer" program.
- D. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

- F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

### 3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

### 3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

### 3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish, and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of occupancy.

### 3.7 DEMONSTRATION

- A. Instruct Commissioner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

### 3.8 DOOR HARDWARE SCHEDULE

- A. The hardware sets represent the design intent and direction of the Commissioner. They are a guideline only and should not be considered a detailed hardware schedule. The following schedule of hardware sets shall be considered a guide and Basis of Design. Furnish door hardware to meet required codes. Refer to previous sections for alternate manufacturers.
- B. Discrepancies, conflicting hardware and missing items should be brought to the attention of the Commissioner. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

## C. Manufacturer's Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. ST - Stanley Works
4. VD - Von Duprin / Ingersoll Rand
5. BS - Best Access Systems /Stanley Security Solutions Inc
6. RO - Rockwood
7. SA - Sargent
8. AD - Adams Rite
9. RF - Rixson
10. NO - Norton
11. SE - Securitron
12. SC - Schlage

## HARDWARE SET 1.0

Doors: 01

3	Hinge (heavy weight)	T4A3386 NRP 5" x 4-1/2"	US26D	MK	087100
1	Mortise Lock (Storeroom)	45H7D-3R	US26D	BS	087100
1	Anti-Vandal Trim	VT	32D	BS	087100
1	Door Closer	UNI7500	689	NO	087100
1	Threshold	1716AK		PE	087100
1	Gasketing	2891AS		PE	087100
1	Door Bottom	434ARL		PE	087100
1	Magnetic door contact - see Security Drawings				

## HARDWARE SET 2.0

Door: 02

2	Continuous Hinges	CFM108HD1		PE	087100
1	Flush Bolt	555	US26D	RO	087100
1	Flush Bolt	555 36"	US26D	RO	087100
1	Dust Proof Strike	570	US26D	RO	087100
1	Mortise Deadlock	MS1950	628	AD	087100
1	Cylinder	1E-74	US26D	BS	087100
1	Cylinder	1E-7A4 (thumbturn) RM3310-96 Mtg-Type 12	US26D	BS	087100
2	Pulls	MP	US32D	RO	087100
2	Door Closers	UNI7500	689	NO	087100

1	Threshold	1716AK		PE	087100
1	Gasketing	2891AS		PE	087100
2	Sweep	345AV		PE	087100
1	Astragal	S771BL		PE	087100
2	Magnetic door contact – see Security Drawings				

HARDWARE SET 2.1

Doors: 03, 06

2	Continuous Hinges	CFM108HD1		PE	087100
		RM3310-96 Mtg-Type 12			
2	Pull	MP	US32D	RO	087100
2	Door Closer	UNIJ7500	689	NO	087100
1	Threshold	1716AK		PE	087100
1	Gasketing	2891AS		PE	087100
2	Sweep	345AV		PE	087100
1	Astragal	S771BL		PE	087100
2	Magnetic door contact – see Security Drawings				

HARDWARE SET 2.2

Door: 07

2	Continuous Hinges	CFM108HD1		PE	087100
	Exit Device (Concealed, storeroom)	5547-RX (extended rod for tall door)	US32D	VD	087100
2	Exit Device Trim	371L-03-BE	US32D	VD	087100
2	Strike sets	301L/471U		VD	087100
2	Door Closer	UNIJ7500	689	NO	087100
1	Threshold	1716AK		PE	087100
1	Gasketing	2891AS		PE	087100
2	Sweep	345AV		PE	087100
1	Astragal	S771BL		PE	087100
1	Electromagnetic Lock	M452P		SC	087100
2	Magnetic door contact – see Security Drawings				
1	Card Reader – see Security Drawings				

HARDWARE SET 2.3

Door: 08

1	Continuous Hinge	CFM108HD1		PE	
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1	Exit Device (concealed, storeroom)	5547-EO (extended rod for tall door)	US32D	VD	087100
1	Strike sets	301L/471U RM3310-96 Mtg-Type 12		VD	087100
1	Pull	MP	US32D	RO	087100
1	Door Closer	UNIJ7500-HO	689	NO	087100
1	Threshold	1716AK		PE	087100
1	Gasketing	2891AS		PE	087100
1	Sweep	345AV		PE	087100
1	Magnetic door contact – see Security Drawings				

## HARDWARE SET 3.0

Doors: 04, 05

1	Continuous Hinge	CFM108HD1 RM3310-96 Mtg-Type 5HD		PE	087100
2	Pull	MP	US32D	RO	087100
1	Door Closer	UNIJ7500	689	NO	087100
1	Door Stop	441CU	US26D	RO	087100
3	Silencer	608		RO	087100

## HARDWARE SET 4.0

Doors: 09, 10, 11, 13, 14, 25, 27

2	Pivot	327	26D	ST	087100
2	Flush Pull	95A	US26D	RO	087100
2	Concealed Overhead Stop	1-X36	630	RF	087100
2	Silencer	608		RO	087100

## HARDWARE SET 4.1

Doors: 12

4	Pivot	327	26D	ST	087100
4	Surface Bolt	585-24	US26D	RO	087100
2	Flush Pull	95A	US26D	RO	087100
4	Concealed Overhead Stop	1-X36	630	RF	087100
4	Silencer	608		RO	087100

## HARDWARE SET 4.2

Door: 26

1	Pivot	327	26D	ST	087100
1	Flush Pull	95A	US26D	RO	087100
1	Concealed Overhead Stop	1-X36	630	RF	087100
1	Silencer	608		RO	087100

## HARDWARE SET 5.0

Doors: 15

2	Continuous Hinge	CFM108HD1		PE	087100
1	Flush Bolt	555	US26D	RO	087100
1	Flush Bolt	555 36"	US26D	RO	087100
1	Dust Proof Strike	570	US26D	RO	087100
1	Mortise Deadlock	MS1950	628	AD	087100
1	Cylinder	1E-74	US26D	BS	087100
1	Cylinder	1E-7A4 (thumbturn) RM3310-96 Mtg-Type 5HD	US26D	BS	087100
4	Pull	MP	US32D	RO	087100
2	Door Closer	UNIJ7500	689	NO	087100
1	Threshold	1716AK		PE	087100
1	Gasketing	2891AS		PE	087100
2	Sweep	345AV		PE	087100
1	Astragal	S771BL		PE	087100
1	Electromagnetic Lock (active leaf)	M450P		SC	087100
2	Magnetic door contact – see Security Drawings				
2	Card Reader – see Security Drawings				

## HARDWARE SET 5.1

Doors: 16

1	Continuous Hinge	CFM108HD1		PE	087100
1	Mortise Deadlatch	MS4510	628	AD	087100
1	Cylinder	1E-74	US26D	BS	087100
1	Cylinder	1E-7A4 (thumbturn)	US26D	BS	087100
1	Electric Strike	6211AL-FSE RM3310-96 Mtg-Type 12	US32D	VD	087100
2	Pulls	MP	US32D	RO	087100
1	Concealed Overhead Stop	6-X36	630	RF	087100
1	Door Closer	7500	689	NO	087100
1	Threshold	1716AK		PE	087100

1	Gasketing	2891AS		PE	087100
1	Sweep	345AV		PE	087100
1	Astragal	S771BL		PE	087100
2	Magnetic door contact – see Security Drawings				
1	Card Reader – see Security Drawings				

## HARDWARE SET 6.0

Door: 20

1	Continuous Hinge	CFM108HD1		PE	087100
1	Mortise Deadlock	MS1950	628	AD	087100
1	Cylinder	1E-74	US26D	BS	087100
1	Cylinder	1E-7A4 (thumbturn)	US26D	BS	087100
2	Pull	RM3310-96 Mtg-Type 12 MP	US32D	RO	087100
1	Concealed Overhead Stop	6-X36	630	RF	087100
1	Door Closer	7500	689	NO	087100
3	Silencer	608		RO	087100

## HARDWARE SET 6.1

Doors: 21, 22

1	Continuous Hinge	CFM108HD1		PE	087100
1	Mortise Deadlatch	MS4510	628	AD	087100
1	Cylinder	1E-74	US26D	BS	087100
1	Cylinder	1E-7A4 (thumbturn)	US26D	BS	087100
1	Electric Strike	6211AL-FSE	US32D	VD	087100
2	Pull	RM3310-96 Mtg-Type 12 MP	US32D	RO	087100
1	Concealed Overhead Stop	6-X36	630	RF	087100
1	Door Closer	7500	689	NO	087100
3	Silencer	608		RO	087100
2	Magnetic door contact – see Security Drawings				
1	Card Reader – see Security Drawings				

## HARDWARE SET 7.0

Doors: 17

3	Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1	Push Plate	70C	US32D-MS	RO	087100
1	Pull Plate	107x70C	US32D-MS	RO	087100

1	Door Closer	CLP7500	689	NO	087100
3	Silencer	608		RO	087100
1	Door Stop	441CU	US26D	RO	087100
					087100

## HARDWARE SET 7.1

Doors: 18

3	Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1	Push Plate	70C	US32D-MS	RO	087100
1	Pull Plate	107x70C	US32D-MS	RO	087100
1	Door Closer	7500	689	NO	087100
1	Door Stop	441CU	US26D	RO	087100
3	Silencer	608		RO	087100

## HARDWARE SET 8.0

Doors: 19

3	Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK	087100
1	Mortise Latchset (Classroom)	45HR-3R	US26D	BS	087100
1	Door Stop	441CU	US26D	RO	087100
3	Silencer	608		RO	087100

## HARDWARE SET 9.0

Doors: 23, 24

8	Hinge (heavyweight)	T4A3386 NRP 5" x 4-1/2"	US32D	MK	087100
	Exit Device (concealed, storeroom)	5547-F (extended rod for tall door)	US32D	VD	087100
2	Exit Device Trim	371L-03-BE	US32D	VD	087100
2	Strike sets	301L/Soffit Latch		VD	087100
2	Door Closer	UNIJ7500	689	NO	087100
2	Door Stop	441CU	US26D	RO	087100
1	Threshold	1716AK		PE	087100
1	Gasketing	2891AS		PE	087100
2	Door Bottom	434ARL		PE	087100
1	Astragal	S771BL		PE	087100

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## SECTION 08 80 00

## GLASS AND GLAZING

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the glass and glazing as shown on the drawings and/or specified herein, including but not limited to glazing of the following:
  - 1. Insulated glass.
  - 2. Tempered glass.
  - 3. Laminated glass.
  - 4. Curtain wall.
  - 5. Entrances.
  - 6. Interior storefront.
  - 7. Interior partitons.
  - 8. Fire-rated glazing.
  - 9. Glass markings.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Metal Fabrications – Section 05 70 00.
- C. Hollow metal doors and frames - Section 08 11 13.
- D. Aluminum Entrances and Storefronts – Section 08 41 00.

E. Glazed Aluminum Curtainwalls – Section 08 44 13.

F. Aluminum Windows – Section 08 51 00.

G. Signage – Section 10 14 00.

#### 1.4 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Glass Design: Glass thicknesses indicated on drawings and/or specified herein are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:

1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:

a. Specified Design Wind Loads: 30 psf or greater if required by Code.

2. Probability of Breakage for Vertical Glazing:

a. 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.

b. 1 lite per 1000 for lites installed 15 degrees from the vertical and under wind action.

c. Load Duration: 30 seconds or less.

3. Maximum Lateral Deflection: For glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/100 times the short side length or 3/4", whichever is less.

4. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

a. Temperature Change (Range): 120 deg. F ambient; 180 deg F, material surfaces.

C. Glass units shall be annealed, heat strengthened, fully tempered or laminated where required to meet wind and/or snow loads and safety glazing requirements, as shown, specified or recommended by the glass fabricator and as required by the prevailing Building Code.

#### 1.5 SUBMITTALS

A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit manufacturer's printed product data, specifications, standard details, glazing instructions, use limitations and recommendations for each material used. Provide certifications that materials and systems comply with specified requirements, including performance requirements.
- C. Submit compatibility and adhesion test reports from sealant manufacturer indicating materials were tested for compatibility and adhesion with glazing sealant, as well as other glazing materials including insulation units.
- D. Initial Selection Samples: Submit samples of each glass and glazing material showing complete range of colors, textures, and finishes available for each material used.
1. Submit complete range of samples of standard colors and patterns for ceramic frits at insulating glass.
  2. Submit complete range of samples of sandblasted glass showing variations of grits and opacity achieved.



- E. Verification Samples: Submit representative samples of each glass and glazing material that is to be exposed in completed work. Show full color ranges and finish variations expected. Provide glass samples having minimum size of 144 sq. in. and 6 in. long samples of sealants and glazing materials; all samples shall bear the name of the manufacturer, brand name, thickness, and quality.
- F. Calculations: Provide wind load charts, calculations and certification of performance of this work. Indicate how design requirements for loading and other performance criteria have been satisfied.
- G. Test Reports: Provide certified reports for specified tests.
- H. Warranties: Provide written warranties as specified herein.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 QUALITY ASSURANCE

- A. Experience Requirements
  - 1. Installer: The contractor or subcontractor performing the work of this Section must have successfully completed in a timely fashion projects similar in scope and type to the required work.
- B. Source: For each glass and glazing type required for work of this Section, provide primary materials which are products of one manufacturer. Provide secondary or accessory materials which are acceptable to manufacturers of primary materials.
- C. Glass Thickness: Glass thicknesses shown on drawings and/or specified herein are minimum thicknesses. Determine and provide size and thickness of glass products that are certified to meet or exceed performance requirements specified in this Section.
- D. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated.
  - 1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
  - 2. IGMA Publications: IGMA TM-3000, "Vertical Glazing Guidelines for Sealed Insulating Glass Units."

- E. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, for wired glass, ANSI Z97.1.
1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council.
  2. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.
- F. Insulating Glass Certification Program: Permanently marked on spacers with appropriate certification label of the following testing and inspecting agency:
1. Insulating Glass Certification Council.
  2. Associated Laboratories, Inc.
  3. Insulating Glass Manufacturers Alliance.
- G. Manufacturer shall be ISO 9001-2000 Certified.

#### 1.8 TESTS

- A. Preconstruction Sealant Test: Submit samples of materials to be used to glazing sealant manufacturer to determine sealant compatibility. Include samples of glass, gaskets, glazing materials, framing members, and other components and accessories of glazing work. Test in accordance with ASTM C 794 to verify what type of primers (if any) are required to ensure sealant adhesion to substrates.
1. Submit minimum of nine pieces of each type and finish of framing member, and nine pieces of each type, class, kind, condition, and form of glass, including monolithic, laminated, and insulating glass for adhesion tests.
  2. Provide manufacturer's written report and recommendations regarding proper installation.

#### 1.9 PROJECT CONDITIONS

- A. Weather: Perform work of this Section only when existing or forecasted weather conditions are within limits established by manufacturers of materials and products used.
- B. Temperature Limits: Install sealants only when temperatures are within limits recommended by sealant manufacturer, except, never install sealants when temperatures are below 40 deg. F.

#### 1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in unopened, factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations and GANA Manual.

1. Protect materials from moisture, sunlight, excess heat, sparks and flame.
2. Sequence deliveries to avoid delays, but minimize on-site storage.

#### 1.11 WARRANTIES

- A. General: Warranties shall be in addition to, and not a limitation of, other rights the City of New York may have under the Contract Documents.
- B. Manufacturer's Special Project Warranty on Coated Glass Products: Provide written warranty signed by manufacturer of coated glass agreeing to furnish f.o.b. point of manufacture, within specified warranty period indicated below, replacements for those coated glass units which develop manufacturing defects. Manufacturing defects are defined as peeling, cracking or deterioration in metallic coating due to normal conditions and not due to handling or installation or cleaning practices contrary to glass manufacturer's published instructions.
  1. Warranty Period: Manufacturer's standard but not less than five (5) years after date of substantial completion.
- C. Manufacturer's Special Project Warranty on Insulating Glass: Provide written warranty signed by manufacturer of insulating glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, replacements for those insulating glass units developing manufacturing defects. Manufacturing defects are defined as failure or hermetic seal of air space (beyond that due to glass breakage) as evidenced by intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coatings, if any, and other visual indications of seal failure or performance; provided the manufacturer's instructions for handling, installing, protecting and maintaining units have been complied with during the warranty period.
  1. Warranty Period: Manufacturer's standard but not less than ten (10) years after date of substantial completion.
- D. Manufacturer's Special Project Warranty on Laminated Glass: Manufacturer's standard form, made out to City of New York and signed by laminated glass manufacturer agreeing to replace laminated glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
  1. Warranty period ten (10) years from date of Substantial Completion.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS/FABRICATORS

- A. All glass and glazing used at the exterior of the Project shall be manufactured by the same manufacturer. The same manufacturer and the same furnace shall be used for all tempered and heat strengthened glass used throughout the project. Acceptable manufacturers include the following:
  1. PPG Industries.
  2. Guardian Industries.
  3. Pilkington.

4. AFG.
5. JE Berkowitz, LP (1-800-257-7827).
6. Viracon.
7. or approved equal.

## 2.2 GLASS MATERIALS AND PRODUCTS

A. Clear Float Glass: ASTM C 1036, Type I (Transparent, Flat), Class 1 (Clear), Quality q3, minimum 1/4" thick.

B. Clear Tempered Glass: ASTM C 1048, Condition A (Uncoated), Type I (Transparent, Flat), Class 1 (Clear), Quality q3, Kind FT, thickness as scheduled, minimum 1/4" thick. Tempered glass must be certified by SGCC to meet applicable standards. Tempered glass shall also conform to the following:

1. Length and Width: For 2.9 mm to 6.0 mm; +/-1.6 mm.
2. Diagonal: +/- 3.0 mm.
3. Edgework: Belt seaming or diamond wheels. 1.5 mm seam of upper and lower glass edges. No sharp edges.
4. Corners: No more than 3.0 mm from square.
5. Float Glass Defects: Must meet the requirements of ASTM C 1036. The most common defects are scratches, stones gaseous bubbles and edge chips. Tables in the glass standards have limits for size/quantity of defects.
6. Tempered glass shall have a minimum surface compression of 10,000 psi.
7. Tempered glass to be heat-treated by horizontal (roller hearth) process with inherent roller-wave distortion parallel to the bottom edge of the glass when installed.
8. Flatness Tolerances
  - a. Roller-Wave or Ripple: The deviation from flatness at any peak shall be targeted not exceed 0.003" as measured per peak to valley for 1/4" (6mm) thick glass.
  - b. Bow and Warp: The bow and warp tolerances shall target a not exceed 1/32" per linear foot.
  - c. Fully tempered glass shall be heat soaked to EN 14179-1:2005-European Heat Soaking Standard.

C. Tempered Low 'E' Coated Glass: Provide high-performance, clear, metallic coating, equal to Energy Advantage Low 'E', as manufactured by Pilkington or Commissioner approved equal. Provide Low 'E' coating which has the following performance characteristics when applied to the No. 2 surface of 1" insulating units, both lites 1/4" clear tempered:

- |                           |                     |
|---------------------------|---------------------|
| 1. Visible Transmittance: | 73%                 |
| 2. Visible Reflectance    | 16% (out), 17% (in) |

3. Winter U-value .33
  4. Shading Coefficient SC: .71
  5. Solar Heat Gain Coefficient (SHGC) .62
- D. Laminated Safety Glass: Provide two glass panes of equal thickness, laminated together with a polyvinyl butyl interlayer, conform to ASTM C 1172, and as follows:
1. Interlayer Colors:
    - a. Clear.
    - b. 40% translucent as scheduled.
  2. Interlayer Material: Provide Monsanto "Saflex", DuPont "Butacite", or approved equal, 0.030" thick at vertical applications, and 0.060" thick at sloped or horizontal applications.
  3. Minimum thickness of 1/4".
- E. Sealed Insulating Glass Units: ASTM E 774, Class A, sealed lites of glass, integral desiccant and argon filled air spaces.
1. Manufacturers:
    - a. Eco-Insulating Glass, Inc.
    - b. Serious Materials
    - c. Southwall Insulating Glass
    - d. Traco
  2. Exterior Curtain Wall Glazing (G1):
    - a. Provide 3/8" fully tempered exterior lite and 1/4" fully tempered interior lite.
    - b. Provide HM88 'Heat Mirror' suspended film by Southwall Technologies between lites and two argon gas filled spaces.
    - c. Provide low-emissivity (low-E) coating on side 3.
    - d. Overall glazing thickness: 1-1/2 inch.
    - e. R-value: 7 or greater.
  3. Exterior Window Glazing (G4):
    - a. Provide 1/4" fully tempered exterior lite and 1/4" fully tempered interior lite.
    - b. Provide HM88 'Heat Mirror' suspended film by Southwall Technologies between lites and two argon gas filled spaces.
    - c. Provide low-emissivity (low-E) coating on side 3.
    - d. Overall glazing thickness: 1-1/4 inch.
    - e. R-value: 7 or greater.
  4. Exterior Door Glazing (G2):
    - a. Provide 3/8" fully tempered exterior lite and 1/4" fully tempered interior lite.
    - b. Provide low-emissivity (low-E) coating on side 3.
    - c. Overall glazing thickness: 1 inch.
    - d. R-value: 3 or greater.
  5. Sealing System: Dual Seal.
  6. Primary Sealant: Polyisobutylene.

7. Secondary Sealant: Silicone, General Electric IGS 3204 or IGS 3100, Dow Corning 982, or approved equal.
8. Spacer: Clear finish aluminum with welded, soldered, or bent corners.
9. Desiccant: Molecular sieve, silica gel, or blend of both.
10. Units shall be certified for compliance with seal classification "CBA" by the Insulating Glass Certification Council (IGCC) or by IGMA and tested in accordance with the above ASTM Test Methods.
11. Insulated glass shall conform to the following:
  - a. Length and Width: + 3.0 mm/ -2.0 mm.
  - b. Diagonal: +/- 3.0 mm.
  - c. Thickness: As agreed +/- 1.0 mm.
  - d. Edge-Deletion of Coating: Minimum 8 mm wide. Width of deletion must be more than the width of the secondary seal. Silver layer(s) must be completely removed. Appearance must be uniform.
  - e. Primary PIB Seal: Must be complete with no breaks. Appearance must be uniform. PIB bead must overlap coating. No visible bright line when glass is viewed in transmission. The width of the PIB bead shall be 4.0 mm + 3.0/ - 1.5 mm.
  - f. Secondary Seal: Nominal 6 mm + 3.0/ - 1.5 mm. The minimum width of the secondary silicone seal for IG units that are glazed structurally must be determined according to ASTM C 1249. The secondary seal must be uniformly applied without bubbles, cavities or gaps. Avoid excess sealant that will need to be trimmed off later.

F. Fire-Rated Glazing Materials (G7):

1. Basis of Design Product: "Premium FireLite" (polished on both surfaces) by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products, or approved equal with the following properties:
2. Properties:
  - a. Thickness: 3/16 inch [5 mm].
  - b. Weight: 2.4 lbs./sq. ft.
  - c. Approximate Visible Transmission: 88 percent.
  - d. Approximate Visible Reflection: 9 percent.
  - e. Hardness (Vicker's Scale): 700.
  - f. Fire-rating: 45 minutes.
  - g. Impact Safety Resistance: None.
  - h. Positive Pressure Test: UL 10C, UBC 7-2 and 7-4; passes.
  - i. Surface Finish: Ground and polished on both sides
3. Positive Pressure Test: UL 10C, UBC 7-2 and 7-4; passes.
4. Fire Rating: Fire rating listed and labeled by UL for fire rating scheduled at opening locations on drawings, when tested in accordance with ASTM E2074-00 and ASTM E2010-01.

### 2.3 GLAZING MATERIALS AND PRODUCTS

- A. General: Provide sealants and gaskets with performance characteristics suitable for applications indicated. Ensure compatibility of glazing sealants with insulating glass sealants, with laminated glass interlayers, and with any other surfaces in contact.
- B. General Glazing and Cap Bead Sealant: Provide sealant with maximum Shore A hardness of 50. Provide one of the following:
1. Dow Corning 795.
  2. General Electric Silglaze N 2500 or Contractors SCS-1000.
  3. Tremco Spectrem 2.
- C. Weather Seal Sealant: Provide non-acid curing sealant with movement range  $\pm 50\%$ , ASTM C 719. Provide one of the following:
1. Dow Corning 795.
  2. General Electric Silpruf.
  3. Tremco Spectrem 2.
  4. or approved equal
- D. Dense Elastomeric Compression Seal Gaskets: Provide molded or extruded neoprene or EPDM gaskets, Shore A hardness of  $75\pm 5$  for hollow profile, and  $60\pm 5$  for solid profiles, ASTM C 864.
- E. Cellular, Elastomeric Preformed Gaskets: Provide extruded or molded closed cell, integral-skinned neoprene, Shore A  $40\pm 5$ , and 20% to 35% compression, ASTM C 509; Type II.
- F. Preformed Glazing Tape: Provide solvent-free butyl-polyisobutylene rubber with 100% solids content complying with ASTM C1281 AAMA A 800 with integral continuous EPDM shim. Provide preformed glazing tape in extruded tape form. Provide Tremco "Polyshim II" or approved equal.
- G. Setting Blocks: Provide 100% or silicone blocks with Shore A hardness of 80-90. Provide products certified by manufacturer to be compatible with silicone sealants. Length to be not less than 4". Width for setting blocks to be  $1/16$ " more than glass thickness and high enough to provide the lite recommended by glass manufacturer. When thickness of setting block exceeds  $3/4$ " the glass manufacturer must be consulted for sizes and configuration. In a vented system, setting block shall be designed so as to not restrict the flow of water within the glazing rabbet to the weep holes.
1. Shims: For shims used with setting blocks, provide same materials, hardness, length and width as setting blocks.
  2. Structural Silicone Glazing: Provide silicone setting blocks where structural silicone occurs at sills and at insulating units with silicone edge seals.
- H. Edge Blocks: Provide neoprene or silicone as required for compatibility with glazing sealants. Provide blocks with Shore A hardness of  $55\pm 5$ .

- I. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place.
- J. Miscellaneous Glazing Materials: Provide sealant backer rods, primers, cleaners, and sealers of type recommended by glass and sealant manufacturers.
- K. Mirror Adhesive: Palmer's "Mirro-Mastic", or approved equal; mastic must be compatible with mirror backing.
  - 1. Clips: No. 4 finish Type 304 stainless steel.

#### 2.4 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.
- C. Grind smooth and polish exposed glass edges.

#### 2.5 GLASS MARKINGS

- A. Glass markings shall be placed on all transparent glass doors and fixed adjacent transparent sidelights per the requirements of Part 47 of the NY State Department of Labor Safety and Health.
- B. Markings: Shall be decals, adhered from the building interior, at the indicated and required locations. Decal size and shape shall be determined by the Commissioner, but shall comply with the size requirements in the noted law.
- C. Application of the decals shall be done per manufacturer's recommendations and shall be level, plumb, centered as indicated and free from any air bubbles or delamination.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  - 2. Presence and functioning of weep system.
  - 3. Minimum required face or edge clearances.
  - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.



### 3.3 GENERAL GLAZING STANDARDS

- A. Install products using the recommendations from the manufacturer of glass, sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those in the "GANA Glazing Manual".
- B. Verify that Insulating Glass (IG) Unit secondary seal is compatible with glazing sealants.
- C. Install glass in prepared glazing channels and other framing members.
- D. Install setting blocks in rabbets as recommended by referenced glazing standards in "GANA Glazing Manual" and "IGMA Glazing Guidelines".
- E. Provide bite on glass, minimum edge and face clearances and glazing material tolerances recommended by "GANA Glazing Manual".
- F. Provide weep system as recommended by "GANA Glazing Manual".
- G. Set glass lites in each series with uniform pattern, draw, bow and similar characteristics.
- H. Distribute the weight of glass unit along the edge rather than the corner.
- I. Comply with manufacturers and referenced industry standards on expansion joint and anchors; accommodating thermal movement; glass openings; use of setting blocks, edge, face, and bite clearances; use of glass spacers; edge blocks and installation of weep systems.
- J. Protect glass edge damage during handling and installation.
- K. Prevent glass from contact with contaminating substances that result from construction operations, such as weld spatter, fireproofing or plaster.
- L. Remove and replace glass that is broken, chipped cracked or damaged in any way.

### 3.4 GLAZING

- A. Glazing channel dimensions, as indicated on Shop Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where the length plus width is larger than 50 inches as follows:

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- J. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.
- K. Flush Glazing
1. If the butt joint in the metal framing is in the vertical direction, the glazier shall run the tape initially on the head and sill members going directly over this joint. Should the butt joint in the metal framing run horizontally, tapes must first be applied to the jambs so that it crosses over the joint.
  2. Each tape section shall butt the adjoining tape and be united with a tool to eliminate any opening.
  3. Do not overlap the adjoining length of tape or rubber shim as this will prevent full contact around the perimeter of glass.
- L. Off-Set Glazing
1. Where the glazing legs are off-set, the difference in the rabbet width shall be compensated by employing different glazing tapes with different diameter shims. The difference in shim shall be equal to the size of the off-set. The thinner tape shall be positioned first on the glazing leg closest to the interior. The thicker tape shall be cut to the exact length of the dimension between the applied tapes, and installed on the outermost glazing leg.
  2. Immediately prior to setting glass, paper backing shall be removed. Apply a toe bead of sealant 6" in each direction, from each corner.
  3. Locate setting blocks in the sill member at quarter points, or if necessary to within 6" of each corner. Setting blocks must be set equal distance from center line of the glass and high enough to provide the recommended bite and edge clearances.
  4. Set edge block according to glass manufacturer's recommendations.
  5. Set Glass: The glass shall be pressed firmly against the tape to achieve full contact.

6. In a vented system, apply a heel bead (air seal) of sealant around the perimeter of glass, between the sole of the I.G. unit and the base of the rabbet of the metal framing developing a positive bond to the unit and to the metal framing. The bead of the sealant shall be deep enough so that it will partially fill the channel to a depth of 1/4" between the glass edge and the base of the metal framing rabbet.
7. Interior stops shall be set, and glazing tape spline for the appropriate face clearance shall be rolled into place, compressing the glass to the shim within the glazing tape.

### 3.5 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant as recommended by glass manufacturer or glass frame manufacturer.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape where noted on approved shop drawings.

### 3.6 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Install gaskets so they protrude past face of glazing stops.

### 3.7 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### 3.8 FRAMELESS MIRRORS

- A. Apply mastic to back of mirror "pats" spaced 4 pats/sq. ft.; adjust mirror so that it is plumb and in place to avoid distortion of reflecting images. Allow 1/8" space between back of mirror and wall surface.
  1. Apply "pats" using Palmer Electric Applicator or approved equal.
- B. Apply stainless steel clips at mirror top and bottom; securely clip to substrate using non-corrosive anchors. At drywall back-up anchors must be secured to studs or steel wallplate spanning from stud to stud.

### 3.9 PROTECTION AND CLEANING

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
- E. Clean excess sealant or compound from glass and framing members immediately after application, using solvents or cleaners recommended by manufacturers.
- F. Glass to be cleaned according to:
  1. GANA Glass Information Bulletin GANA 01-0300 – "Proper Procedure for Cleaning Architectural Glass Products".
  2. GANA Glass Informational Bulletin GANA TD-02-0402 – "Heat Treated Glass Surfaces are Different".
- G. Do not use razor blades, scrapers or metal tools to clean glass.

END OF SECTION

## SECTION 08 90 00

## LOUVERS AND VENTS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the louvers and vents as shown on the drawings and/or specified herein, including but not necessarily limited to the following:
  - 1. Aluminum louvers.
  - 2. Blank off panels.
  - 3. Bird screens.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Masonry - Section 04 20 00.
- C. Sealant work - Section 07 90 00.
- D. Louvers connected to ductwork - Division 23.

## 1.4 QUALITY ASSURANCE

- A. Structural Performance: Provide exterior metal louvers capable of withstanding the effects of loads and stresses from wind and normal thermal movement without evidencing permanent deformation of louver components including blades, frames, and supports; noise or metal fatigue caused by louver blade rattle or flutter or permanent damage to fasteners and anchors.
  - 1. Wind Load: Uniform pressure (velocity pressure) of 30 lbf/sq. ft., acting inward or outward.

- B. Thermal Movements: Provide louvers that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, and other detrimental effects.
1. Temperature Change (Range): 120 deg. F., ambient; 180 deg. F, material surfaces.
- C. Comply with SMACNA "Architectural Sheet Metal Manual" recommendations for fabrication, construction details and installation procedures, except as otherwise indicated.
- D. Field Measurements: Verify size, location and placement of louver units prior to fabrication.
- E. Shop Assembly: Coordinate field measurements and shop drawings with fabrication and shop assembly to minimize field adjustments, splicing, mechanical joints and field assembly of units. Preassemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS

does not include a product's VOC content, 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 content).

4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit manufacturer's specifications, certified test data, where applicable, and installation instructions for required products, including finishes.
  - C. Shop Drawings: Submit shop drawings for fabrication and erection of louver units and accessories. Include plans, elevations and details of sections and connections to adjoining work. Indicate materials, finishes, fasteners, joinery and other information to determine compliance with specified requirements.
  - D. Samples: Submit six (6) inch square samples of each required finish. Prepare samples on metal of same gauge and alloy to be used in work. Where normal color and texture variations are to be expected, include two (2) or more units in each sample showing limits of such variations.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

#### 1.8 WARRANTY

- A. Finish shall be warranted for a period of 20 years, starting from date of Substantial Completion of the Project.



**PART 2 PRODUCTS****2.1 MATERIALS**

A. Manufacturers: Airline Products, Airolite, Construction Specialties, Industrial Louvers or approved equal.

**2.2 EXTERIOR HORIZONTAL STORM-RESISTANT ALUMINUM LOUVER (LOV1)**

A. Basis of Design Product: RS 4300 Storm-Resistant Louver by Construction Specialties; or a comparable product of one of the following:

1. Airolite Company LLC;
2. Nystrom;
3. Industrial Louvers; or approved equal.

B. Louver Depth: 4".

C. Frame and Blade Nominal Thickness: As required to comply with structural performance requirements, but not less than 0.060 inch for blades and 0.080 inch for frames.

D. Performance Requirements:

1. Free Area: Not less than 6.0 sq. ft. for 48-inch-wide by 48-inch-high louver.
2. Air Performance: Not more than .3-inch wg static pressure drop at 900-fpm free-area velocity.
3. Wind-Driven Rain Performance: Not less than 95 percent effectiveness when subjected to a rain fall rate of 3 inches per hour and a wind speed of 29 mph at a core area intake velocity of 300 fpm.

E. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

F. Blades: Horizontal storm-resistant louvers.

G. Blade Type: Fixed.

H. Frame: Concealed mullion.

I. Finish: Clear Anodized

1. Louvers to be given a one hour 215R1 Architectural Class I anodic coating of 0.7 mil (0.018mm) thickness (Aluminum Association designation AA-C22A41).
2. The thickness of the coating shall be tested in accordance with ASTM B244-68.
3. The coating shall be sealed to pass the ASTM B136-77 Modified Dye Stain Test.

**2.3 CONCEALED MULLION NARROW PROFILE ALUMINUM LOUVER (LOV2)**

A. Basis of Design Product: 2252 Stormproof Thinline concealed mullion louver by Construction Specialties; or a comparable product of one of the following:

1. Airolite Company LLC (AC460);

2. Nystrom (Thin-line Model LSA30)
  3. Industrial Louvers (Thinline 1516); or approved equal.
- B. Louver Depth: 2-3/4" max.
- C. Frame and Blade Nominal Thickness: As required to comply with structural performance requirements, but not less than 0.060 inch for blades and 0.060 inch for frames.
- D. Performance Requirements:
1. Free Area: Not less than 9.0 sq. ft. for 48-inch-wide by 48-inch-high louver.
- E. AMCA Seal: Mark units with AMCA Certified Ratings Seal.
- F. Blades: Horizontal louvers.
- G. Blade Type: Fixed.
- H. Frame: Concealed mullion.
- I. Finish: Clear Anodized
1. Louvers to be given a one hour 215R1 Architectural Class I anodic coating of 0.7 mil (0.018mm) thickness (Aluminum Association designation AA-C22A41).
  2. The thickness of the coating shall be tested in accordance with ASTM B244-68.
  3. The coating shall be sealed to pass the ASTM B136-77 Modified Dye Stain Test.

#### 2.4 LOUVER ACCESSORIES:

- A. Louvers shall be furnished with 1/2" mesh, 0.063" diameter aluminum wire intercrimp bird screen secured in removable extruded aluminum frames.
- B. Provide aluminum blank off panels behind louvers where shown on mechanical drawings, fabricated from 1/8" thick aluminum face sheets, finish to match louvers; reinforce as required to form rigid assembly. Blank off panels shall be insulated with thermafiber insulation of thickness needed to insure an R value of eleven (11).
- C. Fastenings: Fasteners for exterior application shall be stainless steel. Provide types, gauges and lengths to suit unit installation conditions. Use Phillips flat head machine screws for exposed fasteners, unless otherwise indicated.
- D. Anchors and Inserts: Use non-ferrous metal or hot dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use steel or lead expansion bolt devices for drilled in place anchors. Furnish inserts, as required, to be set into concrete or masonry work.
- E. Bituminous Paint: SSPC-Paint 12 (cold applied asphalt mastic).

#### 2.5 FABRICATION, GENERAL

- A. Fabricate frames including integral sills to suit adjacent construction with tolerances for installation, including application of sealants in joints between louvers and adjoining work.

- B. Include supports, anchorages, and accessories required for complete assembly.
- C. Provide sill extensions made of same material as louvers, where indicated, or required for drainage to exterior and to prevent water penetrating to interior.
- D. Join frame members to one another and to stationary louver blades by welding, except where indicated otherwise or where field bolted connections between frame members are necessary by size of louvers. Maintain equal blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions where louvers and vents are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

#### 3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions and directions for the installation of anchorages which are to be embedded in masonry construction. Coordinate the delivery of such items to the project site.

#### 3.3 INSTALLATION

- A. Locate and place louver units plumb, level and in proper alignment with adjacent work.
- B. Use concealed anchorages wherever possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers, as indicated.
- D. Repair finishes damaged by cutting, welding, soldering and grinding operations required for fitting and jointing. Restore finishes and prime coats of paint so that there is no evidence of corrective work. Return items which cannot be refinished in the field to the shop, make the required alterations, and refinish the entire unit, or provide new units, at Contractor's option.
- E. Protect aluminum surfaces from corrosion by application of a heavy coating of bituminous paint on surfaces which will be in contact with concrete, masonry or dissimilar metals.
- F. Provide concealed gaskets, flashings, joint fillers and insulations, and install as the work progresses to make the installations weathertight.

END OF SECTION

## SECTION 09 29 00

## GYPSUM DRYWALL

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the gypsum drywall as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Interior walls, partitions, and ceilings with tape and joint compound finish.
  - 2. Abuse-resistant gypsum board where indicated.
  - 3. Plywood sheathing on non-structural metal framing where indicated.
  - 4. Steel framing systems for gypsum drywall and plywood construction.
  - 5. Sealant for gypsum drywall work.
  - 6. Taping and finishing of drywall joints.
  - 7. Metal edge beads.
  - 8. Bracing and connections.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Access doors - Section 08 31 13.
- C. Painting - Section 09 90 00.

#### 1.4 QUALITY ASSURANCE

- A. The following standards, as well as other standards which may be referred to in this Section, shall apply to the work of this Section:
  - 1. The Gypsum Construction Handbook, latest edition, USG.
- B. Allowable Tolerances: 1/32" offsets between planes of board faces, and 1/16" in 8'-0" for plumb, level, warp and bow.
- C. System Design Load: Provide standard drywall wall assemblies designed and tested by manufacturer to withstand a lateral load of 5 lbs. per sq. ft. for the maximum wall height required, and with deflection limited to L/240 of partition height.
- D. Fire-Resistance Rating: Where gypsum drywall with fire resistance ratings are indicated, provide materials and installations which are identical with those of applicable assemblies tested per ASTM E 119 by fire testing laboratories, or to design designations in UL "Fire Resistance Directory" or in listing of other testing agencies acceptable to authorities having jurisdiction, and compliant with UL Test #2079; criteria for cycle movement for all field height wall sections requiring allowance for vertical deflection within framing details.
- E. Installer: Firm with not less than three years of successful experience in the installation of specified materials.

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

- 1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
- 2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.

3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Submit shop drawing for each drywall partition, showing size and gauges of framing members, hanger and anchorage devices, wallboard types, sealant, methods of assembly and fastening, control joints, corner details, joint finishing and relationship of drywall work to adjacent work.
  - C. Samples: Each material specified herein, 12" x 12", or 12" long, or in manufacturer's container, as applicable for type of material submitted.
  - D. Manufacturer's Literature: Submit technical and installation instructions for each drywall partition specified herein, and for each fire-rated gypsum board assembly. Submit other data as required to show compliance with these specifications, including data for mold resistant joint compound.
  - E. Test Reports: This Contractor shall submit test report, obtained by drywall manufacturer, indicating conformance of drywall assemblies to required fire ratings and sound ratings.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 PRODUCT HANDLING AND PROTECTION

- A. Deliver, store and handle drywall work materials to prevent damage. Deliver materials in their original, unopened containers or bundles, and store where protected from moisture, damage and from exposure to the elements. Store wallboard in flat stacks.
- B. Protect wallboard from becoming wet.

## 1.8 ENVIRONMENTAL CONDITIONS

- A. Provide and maintain minimum temperature of fifty-five (55) degrees F. and adequate ventilation to eliminate excessive moisture within the building in the area of the drywall work for at least twenty-four (24) hours, prior to, during and after installation of drywall work. Installation shall not start until windows are glazed and doors are installed, unless openings are temporarily closed. Space above suspended ceilings shall be vented sufficiently to prevent temperature and pressure build up.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers for Gypsum Drywall Panels and Accessories: Materials specified below, unless noted otherwise or specified herein, are those of U.S. Gypsum Co. Equivalent materials of Georgia Pacific, Lafarge North America, or National Gypsum Co.
- B. Acceptable Manufacturers for Metal Supports of Drywall Assemblies: Unless otherwise noted, provide products manufactured by Dietrich Metal Framing, Super Stud Building Products, Marino/Ware, or Clark Western.

### 2.2 METAL SUPPORTS

#### A. Metal Floor and Ceiling Runners

1. Channel Type: Formed from 20 U.S. Std. gauge (unless otherwise noted) galvanized steel, width to suit channel type metal studs. Use 20 ga. top runners with 1-1/4" minimum flanges.
2. Ceiling runners and head of wall connections at rated partitions shall conform to UL #2079 for cycle movement. Provide positive mechanical connection of framing to structure, allowing for vertical movement within connections. Minimum of 20 ga. galvanized steel for clips, 25 ga. galvanized steel for ceiling runners. Providing a friction free – anti-seizure movement capacity.
  - a. As manufactured by the Steel Network, VertiClip or VertiTrack or equal made by Metal-Lite Inc. or approved equal.
  - b. FireTrak (including stud clips) by FireTrak Corp. or equal made by Metal-Lite Inc. or approved equal.
3. "J" Type: Formed from 20 U.S. Std. gauge galvanized steel, 1" x 2-1/2" or 4" wide (to suit detail) x 2-1/4" (for shaft wall).

#### B. Metal Studs and Framing

1. Channel Type Studs: Channel type with holes for passage of conduit formed from minimum 20 U.S. Std. gauge (unless heavier gauge is required to meet deflection limits) galvanized steel, width as shown on drawings.
2. Furring Channels: Hat shaped, formed from galvanized steel, 25 U.S. Std. gauge.
3. Continuous 16 gauge x 8" wide steel wall plate screwed to studs as required for support of items supported on drywall partitions and walls.

#### C. Suspended Ceiling and Fascia Supports

1. Main Runners: 1-1/2" steel channels, cold rolled at 0.475 lbs. per ft., rust-inhibitive paint finish.
  2. Furring Members: Screw-type hat-shaped furring channels of 25 ga. zinc-coated steel; comply with ASTM C 645.
  3. Hangers: Galvanized, 1" x 3/16" flat steel slats capable of supporting 5x calculated load supported.
  4. Hanger Anchorages: Provide inserts, clips, bolts, screws and other devices applicable to the required method of structural anchorage for ceiling hangers. Size devices for 5x calculated load supported.
  5. Furring Anchorages: 16 ga. galvanized wire ties, manufacturer's standard clips, bolts or screws as recommended by furring manufacturer.
- D. All galvanized steel members shall have coating conforming to ASTM A 653, G60.

### 2.3 GYPSUM WALLBOARD

- A. Gypsum Wall Board: 1/2" thick and 5/8" thick as indicated on drawings, "Sheetrock," 48" wide, in maximum lengths available to minimize end-to-end butt joints.
- B. Fire Rated Gypsum Wall Board: 1/2" thick and 5/8" thick as indicated on drawings, "Sheetrock Firecode C," 48" wide, in maximum lengths available to minimize end-to-end butt joints.
- C. Water Resistant Backing Board for Tile Finish: 1/2" thick and 5/8" thick, 3' x 6', "Durock Tile Backer Board" or "Dens-Shield Tile Backer Board" by Georgia Pacific. Cover joints with a pressure sensitive woven glass fiber tape equal to Imperial Type P Tape.
- D. Water Resistant Gypsum Wall Board (for areas in toilet rooms, lockers, janitor's closets not scheduled to receive ceramic tile, or where fire rating is required): 1/2" thick and 5/8" thick as indicated on drawings, "Sheetrock W/R" or "Sheetrock Firecode C W/R," 48" wide, in maximum lengths available to minimize end-to-end butt joints.
- E. Shaft Wall Liner: Solid gypsum board liner for shaft wall construction, 1" thick, 24" wide, as required to suit condition, by standard lengths as required, beveled edges. Provide "Sheetrock Brand Liner Panel, Enhanced" or "DensGlass Ultra Shaft Guard" by Georgia Pacific.
- F. Exterior Gypsum Wall Board for Soffits: 5/8" thick "USG Exterior Gypsum Ceiling Board" or equal conforming to ASTM C 931.
- G. Mold Resistant Wall Board (at all perimeter walls and wet shafts): 1/2" and 5/8" thick as indicated on drawings, 48" wide "DensArmour Plus" by Georgia Pacific or approved equal that has a rating of 10 per ASTM D 3273.
- H. Abuse Resistant Wallboard: 1/2" and 5/8" thick as indicated on drawings, "Fiberock Brand Panel VHI Abuse Resistant," 48" wide in maximum lengths available to minimize end-to-end butt joints.

### 2.4 PLYWOOD

- A. Plywood Sheathing: Provide plywood wall sheathing on non-structural metal framing, where indicated; APA Structural 1 Rated Sheathing, Interior grade or better, with span



rating to suit stud spacing; thickness as noted on drawings; and fire retardant treated as specified in Section 062000.

## 2.5 ACCESSORIES

- A. Acoustic Insulation: Paper-less, non-combustible, semi-rigid mineral fiber mat, 2" thick, in walls (unless otherwise indicated), 3 lb./cu. ft. maximum density; Thermafiber LLC "Thermafiber," or approved equal.
- B. Fasteners for Wall Board: USG Brand Screws; Type S Bugle Head for fastening wallboard to lighter gauge interior metal framing (up to 20 ga.). Type S-12 Bugle Head for fastening wallboard to heavier gauge interior metal framing (20 ga. to 12 ga.); Type S and Type S-12 Pan Head for attaching metal studs to door frames and runners; and Type G Bugle Head for fastening wallboard to wall board. Lengths specified below under "Part 3 - Execution" Articles and as recommended by drywall manufacturer.
- C. Laminating Adhesive: "Sheetrock Brand Joint Compound"
- D. Metal Trim - Corner Beads: For 90 degree External Corners - "Dur-A-Bead" No. 103, 27 U.S. Std. ga. galvanized steel, 1-1/4" x 1-1/4", for 90 degree external corners.
- E. Metal Trim - Edge Beads: 'L', 'Z', 'J' metal molding profiles with tape-in edges; extruded aluminum or galvanized steel; by Fry Reglet, Pittcon Industries, Gordon Interior Specialties, or approved equal.
- F. Metal Trim - Drywall Molding End Closure: extruded aluminum drywall end closure trim with tape-in edges: "DMEC 4625" by Fry Reglet or approved equal by Pittcon Industries, Gordon Interior Specialties, or equal.
- G. Metal Trim Treatment Materials and Joint Treatment Materials for Gypsum Drywall Boards: Paper tape for joint reinforcing; Setting Type (Durabond 90) or Lightweight Setting Type Joint Compound for taping and topping; and Ready Mix Compound for finishing. For areas to receive mold-resistant drywall, use tape with compounds as recommended by manufacturer.
- H. Control Joints: No. 0.093, USG.
- I. Acoustical Sealant: USG "Acoustical Sealant" or "Tremco Acoustical Caulking" of Tremco Mfg. Co., or approved equal.
- J. Neoprene Gaskets: Conform to ASTM D 1056.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where gypsum drywall is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 GENERAL INSTALLATION REQUIREMENTS

- A. General

1. Install drywall work in accordance with drywall manufacturer's printed instructions and as indicated on drawings and specified herein.
  2. All metal framing for drywall partitions shall extend from floor to underside of structural deck above. Provide for vertical deflection with positive mechanical connections of framing members to structure.
  3. Provide concealed reinforcement, 16 ga. thick by eight (8) inches wide or as detailed or as recommended by manufacturer, for attachment of railings, toilet partitions, and other items to be supported on the partitions which cannot be attached to the metal framing members. Concealed reinforcement shall span between metal studs and be attached thereto using two (2) self-tapping pan head screws at each stud.
    - a. Back of drywall shall be scored or notched to prevent bulging out where reinforcement plate occurs.
- B. Fire-Rated Assemblies: Install fire-rated assemblies in accordance with requirements of authorities having jurisdiction, Underwriters' Laboratories and test results obtained and published by the drywall manufacturer, for the fire-rated drywall assembly types indicated on the drawings.
- C. Sealant
1. Install continuous acoustical sealant bead at top and bottom edges of wallboard where indicated or required for sound rating as wallboard is installed, and between metal trim edge beads and abutting construction.
  2. Install acoustical sealant in 1/8" wide vertical control joints within the length of the wall or partitions, and in all other joints, specified below under "Control Joints." Install bead of acoustical sealant around electric switch and outlet boxes, piping, ducts, and around any other penetration in the wallboard; place sealant bead between penetrations and edge of wallboard.
  3. Where sealant is exposed to view, protect adjacent surfaces from damage and from sealant material, and tool sealant flush with and in same plane as wallboard surface. Sealant beads shall be 1/4" to 3/8" diameter.
- D. Wall Board Application
1. See drawings for all board types. Use fire-rated wallboard for fire-rated assemblies.
  2. Apply wallboard with long dimension parallel to stud framing members, and with abutting edges occurring over stud flanges.
  3. Install wallboard for partitions from floor to underside of structure above and secure rigidly in place by screw attachment, unless otherwise indicated.
  4. Provide "Thermafiber" safin insulation meeting standards of Section 078413 at flutes of metal deck where partitions carry up to bottom of metal deck.
  5. Neatly cut wallboard to fit around outlets, switch boxes, framed openings, piping, ducts, and other items which penetrate wallboard; fill gaps with acoustic sealant.

6. Screw fasten wallboard with power-driven electric screw driver, screw heads to slightly depress surface of wallboard without cutting paper, screws not closer than 3/8" from ends and edges of wallboard.
  7. Where studs are doubled-up, screw fasten wallboard to both studs in a staggered pattern.
- E. Metal Trim: Install and mechanically secure in accordance with manufacturer's instructions; and finish with three (3) coats of joint compound, feathered and finish sanded smooth with adjacent wallboard surface, in accordance with manufacturer's instructions.
1. Corner Beads: Install specified corner beads in single lengths at all external corners, unless corner lengths exceed standard stock lengths.
  2. Edge Beads: Install specified edge beads in single lengths at all terminating edges of wallboard exposed to view, where edges abut dissimilar materials, where edges would be exposed to view, and elsewhere where shown on drawings. Where indicated on drawings, seal joint between metal edge bead and adjoining surface with specified gasket, 1/8" wide minimum and set back 1/8" from face of wallboard, unless other size and profile indicated on drawings.
  3. Casing beads shall be set in long lengths, neatly butted at joints. Provide casing beads at juncture of board and vertical surfaces and at exposed perimeters.
- F. Control Joint Locations: Gypsum board surfaces shall be isolated with control joints where:
1. Ceiling abuts a structural element, dissimilar wall or other vertical penetration.
  2. Construction changes within the plane of the partition or ceiling.
  3. Shown on approved shop drawings.
  4. Ceiling dimensions exceed thirty (30) feet in either direction.
  5. Wings of "L," "U," and "T" shaped ceiling areas are joined.
  6. Expansion or control joints occur in the structural elements of the building.
  7. Shaftwall runs exceed 30' without interruption.
  8. Partition or furring abuts a structural element or dissimilar wall or ceiling.
  9. Partition or furring runs exceed 30' without interruption.
  10. Where control joints are required, ceiling height door frames may be used as control joints. Less than ceiling height frames shall have control joints extending to the ceiling from both corners.
- G. Joint Treatment and Spackling
1. Joints between face wallboards in the same plane, joints at internal corners of intersecting partitions and joints at internal corners of intersections between ceilings and walls or partitions shall be filled with joint compound.

2. Screw heads and other depressions shall be filled with joint compound. Joint compound shall be applied in three (3) coats, feathered and finish surface sanded smooth with adjacent wallboard surface, in accordance with manufacturer's instructions. Treatment of joints and screw heads with joint compound is also required where wallboard will be covered by finish materials which require a smooth surface, such as vinyl wall coverings.

### 3.3 FURRED WALLS AND PARTITIONS

- A. Use specified metal furring channels. Run metal furring channel framing members vertically, space sixteen (16) inches o.c. maximum. Fasten furring channels to concrete or masonry surfaces with power-driven fasteners or concrete stud nails spaced sixteen (16) inches o.c. maximum through alternate wing flanges (staggered) of furring channel. Furring channels shall be shimmed as necessary to provide a plumb and level backing for wallboard. At inside of exterior walls, an asphalt felt protection strip shall be installed between each furring channel and the wall. Furring channel and splices shall be provided by nesting channels at least eight (8) inches and securely anchoring to concrete or masonry with two (2) fasteners in each wing.
- B. Wallboard Installation: Same as specified under Article 3.4 - "Metal Stud Partitions."

### 3.4 METAL STUD PARTITIONS

- A. Runner Installation: Use channel type. Align accurately at floor according to partition layout. Anchor runners securely sixteen (16) inches o.c. maximum with power-driven anchors to floor slab, with power-driven anchors to structural slab above. See "Stud Installation" below for runners over heads of metal door frames. Where required, carefully remove sprayed-on fireproofing to allow partition to be properly installed.
- B. Stud Installation
  1. Use channel type, positioned vertically in runners, spaced as noted on drawings, but not more than sixteen (16) inches o.c.
  2. Anchor studs to floor runners with screw fasteners. Provide snap-in or slotted hole slip joint bolt connections of studs to ceiling runners leaving space for movement. Anchor studs at partition intersections, partition corners and where partition abuts other construction to floor and ceiling runners with sheet metal screws through each stud flange and runner flange.
  3. Connection at ceiling runner for non-rated partitions shall be snap-in or slotted hole slip joint bolt connection that shall allow for movement. Seal studs abutting other construction with 1/8" thick neoprene gasket continuously between stud and abutting construction.
  4. Connections for fire rated partitions at ceiling runners shall conform to UL Design #2079.
  5. Install metal stud horizontal bracing wherever vertical studs are cut or wallboard is cut for passage of pipes, ducts or other penetrations, and anchor horizontal bracing to vertical studs with sheet metal screws.
  6. At jambs of door frames and borrowed light frames, install doubled-up studs (not back to back) from floor to underside of structural deck, and securely anchor studs to jamb anchors of frames and to runners with screws. Provide cross braces from hollow metal frames to underside of slab.

7. Over heads of door frames, install cut-to-length section of runner with flanges slit and web bent to allow flanges to overlap adjacent vertical studs, and securely anchor runner to adjacent vertical studs with sheet metal screws. Install cut-to-length vertical studs from runner (over heads of door frame) to ceiling runner sixteen (16) inches maximum o.c. and at vertical joints of wallboard, and securely anchor studs to runners with sheet metal screws.
  8. At control joints, in field of partition, install double-up studs (back to back) from floor to ceiling runner, with 1/4" thick continuous compressible gasket between studs. When necessary, splice studs with eight (8) inches minimum nested laps and attach flanges together with two (2) sheet metal screws in each flange. All screws shall be self-tapping sheet metal screws.
- C. Runners and Studs at Chase Wall: As specified above for "Runners" and "Studs" and as specified herein. Chase walls shall have either a single or double row of floor and ceiling runners with metal studs sixteen (16) inches o.c. maximum and positioned vertically in the runners so that the studs are opposite each other in pairs with the flanges pointing in the same direction. Anchor all studs to runner flanges with sheet metal screws through each stud flange and runner flange following requirements of paragraph 3.4, B. Provide cross bracing between the rows of studs by attaching runner channels or studs set full width of chase attached to vertical studs with one self-tapping screw at each end. Space cross bracing not over thirty-six (36) inches o.c. vertically.
- D. Wallboard Installation - Single Layer Application (Screw Attached)
1. Install wallboard with long dimension parallel to framing member and with abutting edge joints over web of framing member. Install wallboard with long dimension perpendicular to framing members above and below openings in drywall extending to second stud at each side of opening. Joints on opposite sides of wall shall be arranged so as to occur on different studs.
  2. Boards shall be fastened securely to metal studs with screws as specified. Where a free end occurs between studs, back blocking shall be required. Center abutting ends over studs. Correct work as necessary so that faces of boards are flush, smooth, true.
  3. Wallboard screws shall be applied with an electric screw gun. Screws shall be driven not less than 3/8" from ends or edges of board to provide uniform dimple not over 1/32" deep. Screws shall be spaced twelve (12) inches o.c. in the field of the board and 8" o.c. staggered along the abutting edges.
  4. All ends and edges of wallboard shall occur over screwing members (studs or furring channels). Boards shall be brought into contact but shall not be forced into place. Where ends or edges abut, they shall be staggered. Joints on opposite sides of a partition shall be so arranged as to occur on different studs.
  5. At locations where piping receptacles, conduit, switches, etc., penetrate drywall partitions, provide non-drying sealant and an approved sealant stop at cut board locations inside partition.
- E. Wallboard Installation - Double-Layer Application
1. General: See drawings for wallboard partition types required.
  2. First Layer (Screw Attached): Install as described above for single layer application.

3. Second Layer (Screw Attached): Screw attach second layer, unless laminating method of attachment indicated on drawings or necessary to obtain required sound rating or fire rating. Install wallboard vertically with vertical joints offset thirty-four (34) inches from first layer joints and staggered on opposite sides of wall. Attach wallboard with 1-5/8" screws sixteen (16) inches o.c. along vertical joints and sixteen (16) inches o.c. in the field of the wallboard. Screw through first layer into metal framing members.
  4. Second Layer (Laminated): Install wallboard vertically. Stagger joints of second layer from first layer joints. Laminate second layer with specified laminating adhesive in beads or strips running continuously from floor to ceiling in accordance with manufacturer's instructions. After laminating, screw wallboard to framing members with 1-5/8" screws, spaced twelve (12) inches o.c. around perimeter of wallboard.
- F. Wallboard Installation - Laminated Application: Where laminated wallboard is indicated, use specified laminating adhesive, install wallboard vertically and maintain tolerances as specified for screw attached wallboard.
- G. Insulation Installation: Install where indicated on drawings. Place blanket tightly between studs.
- H. Deflection of Structure Above: To allow for possible deflection of structure above partitions, provide top runners for non-rated partitions with 1-1/4" minimum flanges and do not screw studs or drywall to top runner. Where positive anchorage of studs to top runner is required, anchorage device shall be by means of slotted hole (in clip connection with screw attachment to web of steel through bushings located in slots of clips), or other anchorage device approved by Commissioner.
- I. Control Joints
1. Leave a 1/2" continuous opening between gypsum boards for insertion of surface mounted joint.
  2. Back by double framing members.
  3. Attach control joint to face layer with 9/16" galvanized staples six (6) inches o.c. at both flanges along entire length of joint.
  4. Provide two (2) inch wide gypsum panel strip or other adequate seal behind control joint in fire rated partitions and partitions with safig insulation.
- 3.5 DRYWALL FASCIAS AND CEILINGS
- A. Furnish and install inserts, hanger clips and similar devices in coordination with other work.
  - B. Secure hangers to inserts and clips. Clamp or bolt hangers to main runners.
  - C. Space main runners 4'-0" o.c. and space hangers 4'-0" o.c. along runners, except as otherwise shown.
  - D. Level main runners to a tolerance of 1/4" in 12'-0", measured both lengthwise on each runner and transversely between parallel runners.
  - E. Metal Furring Channels: Space sixteen (16) inches o.c. maximum. Attach to 1-1/2" main runner channels with furring channel clips (on alternate sides of main

runner channels). Furring channels shall not be let into or come in contact with abutting masonry walls. End splices shall be provided by nesting furring channels no less than eight (8) inches and securely wire tying. At any openings that interrupt the furring channels, install additional cross reinforcing to restore lateral stability.

- F. Mechanical accessories, hangers, splices, runner channels and other members used in suspension system shall be of metal; zinc coated, or coated with rust inhibitive paint, of suitable design and of adequate strength to support units securely without sagging, and such as to bring unit faces to finished indicated lines and levels.

1. Provide special furring where ducts are over two (2) feet wide.

- G. Apply board with its long dimension at right angles to channels. Locate board butt joints over center of furring channels. Attach board with one (1) inch self-drilling drywall screws twelve (12) inches o.c. in field of board; eight (8) inches o.c. at butt joints located not less than 3/8" from edges.

### 3.6 FINISHING

- A. Taping: A thin, uniform layer of compound shall be applied to all joints and angles to be reinforced. Reinforcing tape shall be applied immediately, centered over the joint, seated into the compound. A skim coat shall follow immediately, but shall not function as a fill or second coat. Tape shall be properly folded and embedded in all angles to provide a true angle.
- B. Filling: After initial coat of compound has hardened, additional compound shall be applied, filling the board taper flush with the surface. The fill coat shall cover the tape and feather out slightly beyond the tape. On joints with no taper, the fill coat shall cover the tape and feather out at least four (4) inches on either side of the tape. No fill coat is necessary on interior angles.
- C. After compound has hardened, a finishing coat of compound shall be spread evenly over and extending slightly beyond the fill coat on all joints and feathered to a smooth, uniform finish. Over tapered edges, the finished joint shall not protrude beyond the plane of the surface. All taped angles shall receive a finish coat to cover the tape and taping compound, and provide a true angle. Where necessary, sanding shall be done between coats and following the final application of compound to provide a smooth surface, ready for painting.
- D. Fastener Depressions: Compound shall be applied to all fastener depressions followed, when hardened by at least two (2) coats of compound, leaving all depressions level with the plane of the surface.
- E. Finishing Beads and Trim: Compound shall be applied to all bead and trim and shall be feathered out from the ground to the plane of the surface. When hardened, this shall be followed by two (2) coats of compound each extending slightly beyond the previous coat. The finish coat shall be feathered from the ground to the plane of the surface and sanded as necessary to provide a flat, smooth surface ready for decoration.
- F. Level of finish for surface exposed to view shall conform to Level 4 of ASTM C 840 and GA-214 of the Gypsum Association.
- G. Drywall construction with defects of such character which will mar appearance of finished work, or which is otherwise defective, will be rejected and shall be removed and replaced at no expense to the City of New York.

3.7 CLEANING AND ADJUSTMENT

- A. At the completion of installation of the work, all rubbish shall be removed from the building leaving floors broom clean. Excess material, scaffolding, tools and other equipment shall be removed from the building.
- B. Work shall be left in clean condition ready for painting or wall covering. All work shall be as approved by Commissioner.
- C. Cutting and Repairing: Include all cutting, fitting and repairing of the work included herein in connection with all mechanical trades and all other trades which come in conjunction with any part of the work, and leave all work complete and perfect after all trades have completed their work.

3.8 PROTECTION OF WORK

- A. Installer shall advise Contractor of required procedures for protecting drywall work from damage and deterioration during remainder of construction period.

END OF SECTION



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## SECTION 09 30 00

## CERAMIC TILE

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the ceramic tile as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Ceramic mosaic floor tile.
  - 2. Ceramic glazed wall tile and matching base.
  - 3. Setting beds, grout, and sealant.
  - 4. Stone thresholds installed as part of tile installations.
  - 5. Metal edge strips installed as part of tile installations.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Concrete - Section 03 30 00.
- C. Masonry - Section 04 20 00.

## 1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: For cutting, installing and grouting of ceramic tile, use only thoroughly trained and experienced journeyman tile setters who are completely familiar with the requirements of this work, and the recommendations contained in the referenced standards.

B. Codes and Standards: In addition to complying with all pertinent codes and regulations, comply with the following:

1. Manufacture all ceramic tile in accordance with Standard Grade Requirements of ANSI A-137.1.
2. Install all ceramic tile in accordance with the recommendations contained in Handbook for Ceramic Tile Installation of the Tile Council of America, Inc., latest edition.

#### 1.5 SUBMITTALS

A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Manufacturers product information including large scale drawings showing all shapes and profiles.

## C. Samples

1. Before any ceramic tile is delivered to the job site, submit to the Commissioner sample panels, approx. 12" x 12", mounted on hardboard back-up with selected grout color for each color and pattern of ceramic tile and grout specified.
2. Submit 6" length of stone saddles.

- D. Master Grade Certificates: Prior to opening ceramic tile containers, submit to the Commissioner a Master Grade Certificate, signed by an officer of the firm manufacturing the ceramic tile used, and issued when the shipment is made, stating the grade, kind of tile, identification marks for tile containers, and the name and location of the project.

## 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## 1.7 PRODUCT HANDLING

## A. Delivery and Storage

1. Deliver all materials of this Section to the job site in their original unopened containers with all labels intact and legible at time of use.
2. Store all materials under cover in a manner to prevent damage and contamination; store only the specified materials at the job site.

- B. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.

- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

## 1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.

- C. Maintain temperatures at not less than 50 deg. F. in tiled areas during installation and for 7 days after completion.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS OF TILE

- A. Provide tile manufactured by Dal-Tile Corp. as listed on Finish Schedule or equal by American Olean, United States Ceramic Tile Co., Crossville Ceramic, Summitville Tiles Inc., or approved equal meeting these specifications.

### 2.2 UNGLAZED PORCELAIN FLOOR TILE (CT1)

- A. Composition: Porcelain.
- B. Surface: Slip-resistant, with abrasive admixture, unless otherwise indicated.
- C. Size: 2 x 2 inches.
- D. Nominal Thickness: 1/4 inch.
- E. Face: Plain with cushion edges.
- F. Basis of Design Product: American Olean Satinglo Porcelain Commercial Mosaic Tile
- G. Color: Charcoal (A33)
- H. Trim Shapes: Base cove and bullnose wainscot cap.

### 2.3 GLAZED CERAMIC MOSAIC TILE (CT2)

- A. Composition: Porcelain.
- B. Size: 2 x 2 inches.
- C. Nominal Thickness: 1/4 inch.
- D. Face: Plain face with cushion edges.
- E. Basis of Design Product: American Olean Satinglo Porcelain Commercial Mosaic Tile
- F. Color: Satin White (D26)
- G. Trim Shapes: Base cove and bullnose wainscot cap.
- H. Provide sanitary cove base to match wall tile.

### 2.4 TRIM AND SPECIAL SHAPES

- A. Provide external and internal corners, trim shapes at openings, and all other trim and special shapes to match the tile specified herein, as required by field conditions and drawing details.
- B. Where detailed, provide Schluter "Profiles" finishing and protection edges, trim, etc., or approved equal.

## 2.5 TILE ACCESSORIES

- A. Metal Edge Trim and Transition Strips: Provide metal edge trim at all exposed tile edges and floor material transitions, by Schluter or approved equal. Satin Anodized Aluminum edge strips, 1/8 inch wide at top edge; height as indicated; with integral perforated anchoring leg for setting the strip.
1. Edge Trim: Schluter – Jolly-A or approved equal.
  2. Transition Strip: Schluter- Schiene-AE or approved equal.
- B. Marble Saddles: Group 'A' dark grey marble or granite, min. thickness 3/4", with an abrasive hardness not less than 10.0, ASTM C 241. Cut saddle to fit jamb profile. Honed finish.

## 2.6 MORTAR BED, BOND COAT AND GROUT

- A. Portland Cement: ASTM C 150, Type I.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Sand: ASTM C 144, clean and graded natural sand.
- D. Latex – Portland Cement Bond Coat
1. MAPEI, Keralastic System thin set mortar, consisting of Kerabond dry-set mortar and Keralastic latex admixture.
  2. Laticrete; 211 dry-set mortar and 4237 latex admixture.
  3. or approved equal
- E. Wall and Base Tile: Over masonry and concrete use a mortar bed leveling coat conforming to ANSI A108.1A followed by a Latex Portland Cement Bond Coat conforming to ANSI A118.4 and TCA Detail W-211.
- F. Floor Tile and Stone Saddle - Thin Set: Set floor tile and stone saddle using latex modified dry set Portland Cement mortar conforming to ANSI A118.4 and TCA Detail F-113.
- G. Water: Clean, fresh and suitable for drinking.
- H. Grout: For grouting ceramic tile, provide a commercial Portland cement grout "Ultracolor" made Mapei or Laticrete 'Permacolor' with Latex Additive or approved equal; color as selected by the Commissioner. Add latex additive to grout made by same manufacturer as grout.
- I. Physical Properties: The setting beds and grouts must meet the following physical requirements:
1. Compressive Strength – 3000 psi min.
  2. Shear Bond Strength – 500 psi min.
  3. Water Absorption – 4.0% max.
  4. Service Rating (ASTM C 627) – Extra Heavy Duty.

- J. Sealer: Seal all grout joints and all unglazed tile using No. 004 "Keraseal Penetrating Sealer for Unglazed Grout and Tile" by Mapei Corp., "Sealer's Choice 15 Gold" by Aqua Mix Inc., or approved equal.
- K. Temporary Protective Coating: Either product indicated below that is applied in the tile manufacturer's factory and formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
  - 1. Petroleum paraffin wax, applied hot, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg. F. per ASTM D 87.
  - 2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- L. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, equal to "Concentrated Stone & Tile Cleaner" by Aqua-Mix or approved equal, specifically approved for materials and installations indicated by tile and grout manufacturers.

## 2.7 SEALANT

- A. Joint Backing: Preformed, compressible, resilient, non-extruding, non-staining strips of foam neoprene, foam polyethylene, or other material recommended by sealant manufacturer.
- B. Bond Breaker: Polyethylene tape, 3 mils thick, or other material recommended by sealant manufacturer.
- C. Sealant Primer: Colorless, non-staining, or type to suit substrate surface, as recommended by sealant manufacturer.
- D. Sealant: One-part silicone based sanitary sealant, conforming to ASTM C 920, Type S, Grade NS, Class 25. Sealant hardness upon full cure shall be between 20-30 Shore "A" Durometer. Color of sealant to blend with or match adjacent materials, and as selected by the Commissioner. Sealant shall be equivalent to 1700 Sanitary Sealant made by General Electric or equal by Tremco, Dow Corning, or approved equal.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where ceramic tile is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 CONDITION OF SURFACES

- A. Allowable Variations in Substrate Levels for Floors: + 1/8" in 10'-0" distance and 1/4" total max. variation from levels shown.
- B. Grind or fill concrete and masonry substrates as required to comply with allowable variations.

### 3.3 PREPARATION

- A. Coordinate the following with Section 03 30 00:
  - 1. Steel trowel and fine broom finish concrete slabs that are to receive ceramic tile. Cure concrete slabs that are to receive tile before tile application. Do not use liquid curing compounds or other coatings that may prevent bonding of tile setting materials to slabs. Slab shall be dry at time of tile installation.
- B. Etch concrete substrate as may be required to remove curing compounds or other substances that would interfere with proper bond of setting bed. Rinse with water to remove all traces of treatment. Surface must meet finish requirements as noted in ANSI 108.01.
- C. Blending: for tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at project site before installing.
- D. Field Applied Temporary Protective Coating: Pre-coat tile with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

### 3.4 JOINTS IN TILE WORK

- A. Joint Widths: 1/16" wide in ceramic tile.
- B. Alignment: Wall, base and floor joints shall align through the field and trim. Direction and location of all joints as directed by Commissioner.
- C. Movement Joints: Conform to TCA Detail EJ171. Locate where movement joints are in back-up material. Provide movement joint at joints between mop receptors and ceramic tile. Provide movement joint at all vertical internal joints of wall tile. Movement joints 1/8" wide in ceramic tile. Fill all movement joints with specified backing and sealant. Use bond breaker where sufficient space for joint backing does not exist.
  - 1. Provide sealant between ceramic tile and plumbing fixtures, mirrors, pipes, countertops and other dissimilar materials penetrating or adjacent to ceramic tile.

### 3.5 INSTALLATION

- A. Comply with the following installation standards
  - 1. Wall tile over masonry or concrete using dry set mortar - ANSI A108.1 and A108.10.
  - 2. Floor tile using dry set mortar - ANSI A108.5 and A108.10.
- B. All setting beds and/or adhesives shall provide for an average contact area of not less than 95%.
- C. Allowable Variations in Finished Work: Do not exceed the following deviations from level and plumb, and from elevations, locations, slopes and alignment shown.
  - 1. Floors: 1/8" in 10'-0" run, any direction; +/- 1/8" at any location; 1/32" offset at any location.



2. Walls: 1/8" in 8'-0" run, any direction; 1/8" at any location; offset at any location, 1/32".
  3. Joints: +/- 1/32" joint width variation of any location; 1/16" in 3'-0" run deviation from plumb and true.
- D. Handle, store, mix and apply setting and grouting materials in compliance with the manufacturer's instructions.
  - E. Extend tile work into recesses and under equipment and fixtures, to form a complete covering without interruptions. Terminate work neatly at obstructions, edges and corners without disruption of pattern or joint alignment.
  - F. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight, aligned joints. Fit tile closely to electrical outlets, piping and fixtures so that plates, collars, or covers overlap tile.
  - G. Lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls and trim are the same size. Lay out tile work and center tile fields both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths.

### 3.6 INSTALLATION OF STONE SADDLES

- A. Install stone saddles cut to profiles and sizes shown, accurately fitted to jambs, coped at stops, set in full bed of mortar herein specified, and with grouted edge joints as specified for floor tile.

### 3.7 CLEANING AND PROTECTION

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
  1. Remove grout residue from tile as soon as possible.
  2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use cleaners only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning to insure removal of all cleaning material.
  3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. Protect installed tile work with Kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. Apply coat of sealer to all grout joints and all unglazed tile.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings from tile surfaces.
- E. Leave finished installation clean and free of cracked, chipped, broken, unbonded or otherwise defective tile work.

END OF SECTION

SECTION 09 51 00  
ACOUSTICAL CEILINGS

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. This Section includes acoustical panels and exposed suspension systems for ceilings.
- B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete at ceilings.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Carpentry - Section 06 20 00.

## 1.4 DEFINITIONS

- A. AC: Articulation Class.
- B. CAC: Ceiling Attenuation Class.
- C. LR: Light Reflectance coefficient.
- D. NRC: Noise Reduction Coefficient.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.  
The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:
1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: For each type of product indicated.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
1. Acoustical Panel: Set of 6-inch-square Samples of each type, color, pattern, and texture.
  2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch long Samples of each type, finish, and color.
- D. Qualification Data: For firms and persons specified in 'Quality Assurance' Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and other information specified.

- E. Maintenance Data: For finishes to include in maintenance manuals.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed acoustic tile ceilings similar in material, design and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in DDC General Conditions.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

#### 1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above

ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

#### 1.10 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

#### 1.11 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Acoustical Ceiling Panels: Full-size panels equal to 2.0 percent of quantity installed.
  - 2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of quantity installed.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers Acoustical Panels and Metal Suspension Systems: Materials specified below, unless noted otherwise or specified herein, are those of Armstrong World Industries, or equal by CertainTeed or U.S. Gypsum Co.

#### 2.2 ACOUSTICAL PANELS, GENERAL

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
  - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface per ASTM E 795.
  - 2. Acoustical Panel Colors and Patterns: Match appearance characteristics of existing acoustic panel ceiling exactly.
- B. Existing Ceiling Panel:
  - 1. Basis of Design Ceiling Panel Model and Type: Dune (1772) Square Lay-in 15/16"
  - 2. Size: 24 in x 24 in x 5/8"
  - 3. Pattern: to align with and match existing.
- C. Color: White.

- D. LR: Not less than .083.
- E. NRC: Not less than 0.50.
- F. CAC: Not less than 30.
- G. Antimicrobial Treatment: Panel based.
- H. New Ceiling Panels shall match existing tile in color, texture and tone, resulting in the appearance of the new ceiling panels to blend in and be continuous with the existing.

### 2.3 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
- B. Finishes and Colors, General: Match appearance characteristics of existing metal suspension system.
- C. Existing Suspension System:
  - 1. Manufacturer: Armstrong World Industries, or equal by USG or CertainTeed.
  - 2. Basis of Design Suspension System Model and Type: Prelude XL HRC
  - 3. Grid Face: 15/16 inch.
  - 4. Pattern: to align with and match existing.
  - 5. New grid shall match existing grid in color and dimension, resulting in the appearance of the new grid to be continuous with the existing
- D. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.
  - a. Type: Postinstalled expansion anchors.
  - b. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition.
  - 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.
- E. Hanger Rods and Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- F. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch-thick, galvanized steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch- diameter bolts.
- G. Roll-Formed Sheet-Metal Edge Moldings and Trim: Type and profile to match existing.
  - 1. Manufacturer: Armstrong World Industries or equal by USG or CertainTeed.
  - 2. Edge Molding Model and Type: 1/4" Reveal Molding (7877)

3. Grid Face: 15/16 inch.
- H. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.
1. Organic Coating: Thermosetting, primer/topcoat system with a minimum dry film thickness of 0.8 to 1.2 mils.
  2. White.
- 2.4 ACOUSTICAL SEALANT
- A. Products:
1. Acoustical Sealant for Exposed and Concealed Joints:
    - a. Pecora Corp; AC-20 FTR Acoustical and Insulation Sealant.
    - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
    - c. ChemRex, Inc., Contech Brands; PL Acoustic Sealant
  2. Acoustical Sealant for Concealed Joints:
    - a. Pecora Corp.; BA-98.
    - b. Tremco, Inc.; Tremco Acoustical Sealant.
- B. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and 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.
- C. Acoustical Sealant for Concealed Joints: Manufacturer's standard nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

### 3.3 INSTALLATION, GENERAL

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  3. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. 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 three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and 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 structure to which hangers are attached and 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. Do not attach hangers to steel deck tabs.
  8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  9. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
- C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
  3. Do not use exposed fasteners, including pop rivets, on moldings and trim.



- D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- E. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
  - 1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
  - 2. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
  - 3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended by acoustical panel manufacturer.

#### 3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

## SECTION 09 67 23

## EPOXY RESIN COMPOSITION FLOORING AND WALL COATINGS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 WORK INCLUDED

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the epoxy resin composition flooring and base and wall as scheduled on the drawings and/or specified herein.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Concrete - Section 03 30 00.
- C. Unit Masonry – Section 04 20 00
- D. Painting and Finishing – Section 09 90 00
- E. Floor drains - Division 22.

## 1.4 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).

- b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- C. Product Data: Submit manufacturer's technical data application instructions and general recommendations for the epoxy resin composition flooring specified herein.
- D. Samples for initial selection purposes in form of manufacturer's color charts showing full range of colors and finishes available.
1. Submit 4" x 4" samples of color chips from color chart selection designated by the Commissioner.
- E. Material certificates signed by manufacturer certifying that the epoxy resin composition flooring complies with requirements specified herein.
- F. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices.
- G. Mock-up: Prepare a 48" x 48" mock-up of the specified color and finish in an area approved by the Architect. If acceptable, it can be incorporated into the final finish.
- 1.5 LEED PERFORMANCE CRITERIA
- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.

- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## 1.6 QUALITY ASSURANCE

- A. **Installer Qualifications:** Engage an experienced Installer or applicator who has specialized in installing resinous flooring types similar to that required for this Project and who is acceptable to manufacturer of primary materials.
- B. **Single-Source Responsibility:** Obtain epoxy resin composition flooring materials, including primers, resins, hardening agents, and finish or sealing coats, from a single manufacturer.

## 1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels containing brand name and directions for storage and mixing with other components.
- B. Store materials to comply with manufacturer's directions to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.

## 1.8 PROJECT CONDITIONS

- A. **Environmental Conditions:** Comply with epoxy resin composition flooring manufacturer's directions for maintenance of substrate temperature, moisture, ventilation, and other conditions required to execute and protect Work.
- B. **Lighting:** Permanent lighting will be in place and working before installing resinous flooring.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Basis of design for troweled epoxy resin composition flooring (EC) shall be:
  - 1. At concrete slab on grade: Dex-O-Tex Cheminert "K" with Posi-Tred "O" top finish as manufactured by Crossfield Products Corp. or equal by Stonhard, General Polymers, or approved equal.
- B. Basis of design for epoxy resin chemical resistant wall coating (PT4) shall be:
  - 1. At masonry and concrete walls: Dex-O-Tex WallCote E over Resistite polymerized cementitious coating as manufactured by Crossfield Products Corp. or equal by Stonhard, General Polymers, or approved equal.

### 2.2 PROPERTIES

- A. **Colors:** As scheduled, or if not otherwise indicated, as selected by Commissioner from manufacturer's standard colors.

B. Epoxy Resin Composition Flooring Physical Properties: Provide flooring system that meet or exceed the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.

1. Compressive Strength (ASTM C 579): 11,000 psi.
2. Tensile Strength (ASTM C 307): 1643 psi.
3. Flexural Strength (ASTM C 580): 4,300 psi.
4. Flexural Modulus of Elasticity (ASTM C 580):  $2.0 \times 10^6$  psi.
5. Water Absorption (MIL D-3134): 0.3 percent max.
6. Surface Hardness (ASTM D-2240): 85.5 Durometer "D"
7. Abrasion Resistance (ASTM D-1044): 0.0 gr.
8. Indentation (MIL-D-3134): 0.024" max.
9. Impact Resistance (Gardner Impact Tester): No chipping, cracking, or delamination and not more than 0.014"
10. Adhesion (A.C.I. Comm. No. 403): 400 psi
11. Electrical Conductivity (NFPA 56A): Di-electric
12. Critical Radiant Flux (ASTM E-648): Greater than 1.07 watts/cm<sup>2</sup>
13. Co-efficient of Friction - Rubber Shoe Surface (MIL-D-3134 Test Procedure)

Profiles	Static Friction Saltwater Solution on Surface	Static Friction Oil on Surface	Sliding Friction Saltwater Solution on Surface	Sliding Friction Oil on Surface
Fine Profile	0.95	0.75	0.89	0.44
Medium Profile	1.03	0.75	0.95	0.45
Coarse Profile	1.09	0.85	1.00	0.56
Very Coarse Profile	1.24	0.78	1.04	0.59

C. Flexibilized Urethane Epoxy Resin Waterproofing Membrane Properties: provide flooring system that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.

Compressive Strength.....	4,000 psi
Tensile Strength.....	1,500 psi
Tensile Elongation.....	96%
Tear Strength.....	120 lb. /in.

D. Polymeric Floor Coating: provide floor coating system that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.

Tear Strength, Die C  
ASTM D624.

879 lbs/in

Flexibility ASTM D1737 180 DEGREE BEND, 1/8" MANDREL.	PASS	
Tensile Strength ASTM D412		2400 psi
Taber Abrasion ASTM D-060 (CS17 Wheel, 1000g Load, 1000 Cycles)		8 mg loss
Impact Resistance ASTM D2794 160 in/lbs. Reverse		160 in/lbs. Direct
Elongation ASTM D412		100%
Shore Hardness ASTM D2240-91 Type A		90
Solid Percent by Weight (calculated)		95
Gloss ASTM D523		90+
Coefficient of Friction (slip resistance with leather footwear) ASTM D2047		0.67 dry 0.82 wet
<b>CHEMICAL RESISTANCE ASTM D543 24 Hour Immersion</b>		
ACIDS (Organic)	Rating	Weight Change
Citric Acid (1%)	NA	+5%
Lactic Acid (10%)	D	+17%
ACIDS (Mineral)		
Sulfuric Acid (10%)	NA	+6%
Sulfuric Acid (30%)	C	+100%
SOLVENTS		
ISOPROPYL ALCOHOL (99%)	C	+90%
ALKALIS		
Sodium Hydroxide (10%)	NA	+2%
Sodium Carbonate (2%)	NA	5%
Sodium Hypochlorite (5%)	NA	+3%
<b>MISCELLANEOUS COMPOUNDS</b>		
Mineral Oil	NA	<1%
Vegetable Oil	NA	<1%
Aviation Gasoline	NA	+10%
Diesel Fuel	NA	+4%

Rating System

NA = No Attack

D = Deglossed But no Physical Attack

C = Chemical Damage

- E. Polycrylate Composition Underlayment: provide system that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.

Compressive Strength (ASTM C109)	5,140 psi.
Flexural Strength (ASTM C78)	1,268 psi
Flexural Modulus of Elasticity (ASTM C580)	2,415 psi.
Indentation (MIL-PRF-3134)	0.005" max.
Impact Resistance (Gardner Impact Tester)	No chipping, cracking, or delamination and not more 0.014" indentation
Adhesion (A.C.I. Comm No 503.1)	>400 psi (100% failure in concrete)
Shear Bond Strength (ASTM C882)	410 psi

- F. Epoxy Chemical Resistant Wall Coating: provide wall coating that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.

Solids Content .....	100% epoxy solids
Thickness .....	11 mils
Compressive Strength (ASTM D695).....	8,000 psi.
Odor at Installation .....	Nil
Elongation (ASTM D638) .....	13%
Surface Hardness (ASTM D2240) .....	Scale: D: 62
Adhesion (ASTM D695) .....	Exceeds internal strength of gypsum, board backing
Volatile Organic Content .....	None
Flexibility (ASTM D522).....	Passes 1/8" mandrel at 180° bend Without cracking
Wear Resistance (ASTM D1044).....	16mg. Weight loss
Water Absorption (MIL-PRF-3134, Para 4.7.8) .	<0.5% psi.
Cleanability (TT-C-550a) .....	Complies
Flash Point (Tag Closed Cup).....	Exceeds 200°F.

- G. Polymerized Cementitious Coating: provide polymerized cementitious coating system that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.

Thickness .....	1/8"
Compressive Strength (ASTM C109).....	2,440 psi.
Tensile Strength (ASTM C109) .....	430 psi.
Flammability (ASTM E84).....	Flame Spread 4 Smoke Density 0
Resistance to Salt Spray (ASTM B117) .....	1,000 hrs. exposure, No visible degradation
Adhesion (ASTM C882, Type 1) .....	515 psi.
Freeze-Thaw Resistance (ASTM C672) .....	Thirty-two cycles, "O" Scaling
Hardness (ASTM D2240) .....	Durometer A 82
Water Vapor Permeability (ASTM E96).....	1.95 perms/inches
Absorption .....	< 2%
(Weight gain by coated concrete cube after 21 days immersion in water)	

2.3 SUPPLEMENTAL MATERIALS

- A. Joint Sealant: Type recommended or produced by manufacturer of epoxy resin, composition flooring system for type of service and joint condition indicated.
- B. Waterproofing Membrane: Type recommended or produced by manufacturer of epoxy resin composition flooring system for type of service and floor condition indicated.
  - 1. Polycrylate Composition Underlayment: provide system that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.

Compressive Strength (ASTM C109)	5,140 psi.
Flexural Strength (ASTM C78)	1,268 psi
Flexural Modulus of Elasticity (ASTM C580)	2,415 psi.
Indentation (MIL-PRF-3134)	0.005" max.
Impact Resistance (Gardner Impact Tester)	No chipping, cracking, or delamination and not more .014" indentation.
Adhesion (A.C.I. Comm. No. 503.1)	>400 psi (100% failure in concrete)
Shear Bond Strength (ASTM C882)	410 psi

- C. Anti-Microbial Additive: at epoxy resin chemical resistant wall coating incorporate anti-microbial chemical additive to prevent growth of most bacteria, fungi, algae and actinomycetes.



### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions where the epoxy resin composition flooring and epoxy resin chemical resistant wall coating is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Commissioner.
- B. Coordinate work with other trades to insure that concrete substrate has been "wet" cured only.

#### 3.2 PREPARATION - FLOORING

- A. Substrate: Perform preparation and cleaning procedures according to flooring manufacturer's instructions for particular substrate conditions involved, and as specified. Provide clean, dry, and neutral substrate for flooring application.
- B. Concrete Surfaces: Shot-blast, acid etch or power scarify as required to obtain optimum bond of flooring to concrete. Remove sufficient material to provide a sound surface free of laitance, glaze, efflorescence, and any curing compounds or form release agents. Remove grease, oil, and other penetrating contaminants. Repair damaged and deteriorated concrete to acceptable condition. Leave surface free of dust, dirt, laitance, and efflorescence.
- C. Materials: Mix resin and hardener, add colorant and aggregate when required, and prepare materials according to flooring system manufacturer's instructions.

#### 3.3 PREPARATION - WALLS

- A. Substrate: Perform preparation and cleaning procedures according to flooring manufacturer's instructions for particular substrate conditions involved, and specified. Provide clean, dry substrate.
- B. Materials: Mix epoxy resin components when required, and prepare materials according to wall coating system manufacturer's instructions.

#### 3.4 APPLICATION - WALLS

- A. General: Apply each component epoxy resin chemical resistant wall coating system according to manufacturer's directions to produce a uniform monolithic wall coating of thickness indicated.
- B. Bond Coat: Apply bond coat over prepared substrate at manufacturer's recommended spreading rate.
- C. Body Coat: Over bond coat apply epoxy resin chemical resistant wall coating. Overlay adjacent floor base, door frames, etc. as shown on plans.
- D. Finish or Sealing Coats: After body coat has cured sufficiently, apply resin finish coat to produce finish matching approved sample and in number of coats and spread rates recommended by manufacturer.
  - 1. Final finish coat shall be in color as approved by the Commissioner.
  - 2. Finished wall coating shall be 11 mils thick, uniform in color and texture.

### 3.5 APPLICATION – FLOORS

- A. General: Apply each component of epoxy resin composition flooring system according to manufacturer's directions to produce a uniform monolithic wearing surface of thickness indicated.
- B. Bond Coat: Apply bond coat over prepared substrate at manufacturer's recommended spreading rate. Coordinate applying bond coat with topping mix to ensure optimum adhesion between flooring materials and substrate.
- C. Body Coat: Over freshly applied primer, trowel apply epoxy mortar mix at 1/4-inch thickness. Hand or power trowel and grout with epoxy to fill voids. When cured, sand if necessary to remove trowel marks and roughness.
- D. Finish or Sealing Coats: After body coat has cured sufficiently, apply finish or sealing coats of type recommended by flooring manufacturer to produce finish matching approved sample and in number of coats and spreading rates recommended by manufacturer.
  - 1. Final finish coat shall be in color and skid retardant profile as approved by the Commissioner.
  - 2. Finish floor shall be 1/4" thick, uniform in color and free of travel marks.
- E. Cove Base: Apply cove base mix to wall surfaces at locations shown to form cove base height of 4 inches unless otherwise indicated. Round interior and external corners. Follow manufacturer's printed instructions and details including taping, mixing, priming, troweling, sanding, and top-coating of cove base.
- F. Joints: Where substrate is interrupted by expansion or control joints, provide joint in flooring to comply with details indicated or, if not otherwise indicated, as recommended by flooring manufacturer.
  - 1. Apply joint sealant materials to comply with resinous flooring manufacturer's recommendations.

### 3.6 CURING, PROTECTION AND CLEANING – WALLS

- A. Cure epoxy resin chemical resistant wall coating materials according to manufacturer's directions, taking care to prevent contamination during application stages and before completing curing process. Close application area for a minimum of 24 hours.

### 3.7 CURING, PROTECTION AND CLEANING – FLOORING

- A. Cure epoxy resin composition flooring materials according to manufacturer's directions, taking care to prevent contamination during application stages and before completing curing process. Close application area for a minimum of 24 hours.
- B. Protect epoxy resin composition flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and application method.
- C. Cleaning: Remove temporary covering and clean epoxy resin composition flooring just before final inspections. Use cleaning materials and procedures recommended by flooring manufacturer.

END OF SECTION

## SECTION 09 68 00

## CARPETING

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the carpeting as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Carpet tile and installation.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Concrete – Section 03 30 00.

## 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Firm with not less than three (3) years of experience in installation of commercial carpeting of type, quantity and installation methods similar to work of this Section.
- B. Manufacturer Qualifications: Firm (carpet mill) with not less than three (3) years of production experience with carpet similar to types specified in this Section; and whose published product literature clearly indicates general compliance of products with requirements of this Section.
- C. General Terminology/ Information Standard: Refer to current edition of "Carpet Specifier's Handbook" by The Carpet and Rug Institute; for definitions of terminology not otherwise defined herein, and for general recommendations and information.
- D. Carpet used on Project must be from same dye lot for each carpet type.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit manufacturer's complete technical product data for each type of carpet and accessory item required.
- C. Shop Drawings: Show the following:
1. Indicate columns, doorways, enclosing wall/partitions, built-in cabinets and locations where cut-outs are required in carpet.
  2. Existing flooring materials to remain and be removed.
  3. Carpet tile type, color and dye lot.

4. Pattern of installation, pattern type, location and direction.
  5. Type, color and location of edge, transition and other accessory strips,
  6. Transition details to other flooring materials.
- D. Samples: Submit full size samples of each carpet required and 12 inch long samples of each type exposed edge stripping and accessory.
- E. Maintenance Data: Submit manufacturer's printed maintenance recommendations, including methods and frequency recommended for maintaining carpet in optimum conditions under anticipated traffic and use conditions.
- F. Monitoring under a nationally recognized building code review and listing program.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section

#### 1.7 EXTRA STOCK

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packages with protective covering for storage and identified with labels describing contents.
1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

#### 1.8 PRODUCT DELIVERY AND STORAGE

- A. Comply with CRI 104, Section 5, "Storage and Handling."

#### 1.9 PROJECT CONDITIONS

- A. Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity."
- B. Environmental Limitations: Do not install carpet tile until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet tile over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer

## 1.10 WARRANTY

- A. The Contractor shall repair seams, joints and edge, if required, after the original installation is complete. The exact time for this work shall be left to the discretion of the Commissioner, but shall be within twelve (12) months after final approval of finished installation. Fourteen (14) day notice for repairs shall be given by the Commissioner, so that the Contractor can make the necessary arrangements.
- B. Further, the Contractor shall provide a one-year unconditional warranty against workmanship defects covering further repair of seams, puckering and any other defects that might be directly attributed to defect in workmanship.
- C. The manufacturer shall provide a warranty that the face yarn of the carpet will not wear more than ten (10) percent in five years. If the carpet wears more than ten (10) percent in five (5) years, the manufacturer will replace the carpet including parts, labor and materials, to the Commissioner's satisfaction.

## PART 2 PRODUCTS

## 2.1 CARPET TILE

- A. Basis of Design Product:
  - 1. Manufacturer: Desso
  - 2. Style: "Tempra"
  - 3. Product: A235-9511
  - 4. Size: 19.68 inch x 19.68 inch.
  - 5. Description: Tufted 1/10" loop pile piece dyed continuous BCP Polyamide 6 pile fiber, Polyester - polyamide backing.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Shaw, Bentley, Armstrong or equal.

## 2.2 ACCESSORIES

- A. Provide vinyl edges, reducers and threshold plates where required. They shall be sized to be compatible with the thickness of the carpet, in a color as selected by the Commissioner, of a commercial quality as manufactured by Armstrong, Mercer Plastics Co., Inc., or approved equal. The type shall be as required by site conditions, as is the custom of the trade, and installation shall be made as recommended by the manufacturer.
- B. Adhesive: Provide adhesive as recommended by the carpet manufacturer. Provide adhesive which complies with flame spread rating required for the carpet installation, if any.
- C. Leveling Compound: Latex/Portland cement flash patching and leveling compound equal to No. 226 with 3701 admixture made by Laticrete or equal made by Mapei, H.B. Fuller or approved equal.

- D. Miscellaneous Materials: Provide the types of seaming, adhesives and tape, thread, and other accessory items recommended by the carpet manufacturer and installer for the conditions of installation and use.

### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions where carpet is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

#### 3.2 PRE-INSTALLATION REQUIREMENTS

- A. Repair minor holes, cracks, depressions or rough areas in substrate using latex leveling compound.
- B. Clear away debris and scrape up cementitious deposits from surfaces to receive carpeting. Vacuum clean immediately before installation. Check concrete surfaces to ensure no "dusting" through installed carpet; apply sealer where required to prevent dusting.
- C. Sequence carpeting with other work so as to minimize possibility of damage and soiling of carpet during remainder of construction period.

#### 3.3 INSTALLATION

##### A. General

1. Comply with CRI 104, Section 13, "Carpet Modules (Tiles)."
2. Comply with manufacturer's written instructions and recommendations.
3. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind and seal cut edges as recommended by carpet tile manufacturer.
4. Extend carpet under open-bottomed and raised-bottom obstructions, and under removable flanges of obstructions. Extend carpet into closets and alcoves of rooms indicated to be carpeted, unless another floor finish is indicated for such spaces. Extend carpet under all movable furniture and equipment, unless otherwise indicated.
5. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finishing floor as marked on subfloor. Use nonstaining marking device.
6. Install pattern parallel to walls and borders..

#### 3.4 CLEANING UP

- A. Upon completion of the carpeting installation in each area, visually inspect all carpet installed in that area and immediately remove all dirt, soil, and foreign substance from the exposed face; inspect all adjacent surfaces and remove all marks and stains



caused by the carpet installation: remove all packaging materials, carpet scraps, and other debris from the carpet installation to the area of the job site set aside for its storage.

3.5 PROTECTION

- A. Protect installed carpet tile to comply with CRI 104, Section 15, "Protection of Indoor Installations."
- B. Provide temporary, protection against soiling or damage of carpet for the remainder of the construction period. Use protection methods indicated or recommended in writing by the carpet tile manufacturer.

END OF SECTION

## SECTION 09 90 00

## PAINTING AND FINISHING

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the painting and finishing as shown on the drawings and/or specified herein, including, but not limited to, the following:
1. Prime painting unprimed surfaces to be painted under this Section.
  2. Painting all items furnished with a prime coat of paint, including touching up or repairing of abraded, damaged or rusted prime coats applied by others.
  3. Painting all ferrous metal (except stainless steel) exposed to view.
  4. Painting all galvanized ferrous metals exposed to view.
  5. Painting interior concrete block exposed to view.
  6. Painting gypsum drywall exposed to view.
  7. Painting pipes, pipe coverings, conduit, ducts, insulation, hangers, supports and other mechanical and electrical items and equipment exposed to view.
  8. Painting surfaces above, behind or below grilles, gratings, diffusers, louvers, lighting fixtures, and the like, which are exposed to view through these items.
  9. Incidental painting and touching up as required to produce proper finish for painted surfaces, including touching up of factory finished items.
  10. Painting of any surface not specifically mentioned to be painted herein or on drawings, but for which painting is obviously necessary to complete the job, or work which comes within the intent of these specifications, shall be included as though specified.

### 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Masonry Sealers – Section 04 20 00.
- C. Epoxy Resin Composition Flooring and Wall Coatings – Section 09 67 23.
- D. Shop priming is required on some, but not all of the items scheduled to be field painted. Refer to other Sections of work for complete description.
- E. Shop coat on machinery and equipment: Refer to the Sections under which various items of manufactured equipment with factory applied shop prime coats are furnished, including, but not necessarily limited to, the following Sections. All items of equipment furnished with prime coat finish shall be finish painted under this Section.
  - 1. Plumbing - Division 22.
  - 2. Heating, ventilation and air conditioning – Division 23.
- F. Color Coding of Mechanical Piping and Electrical Conduits – Divisions 22 and 26.
  - 1. This Color Coding consists of an adhesive tape system and is in addition to painting of piping and conduits under this Section, as specified above.

### 1.4 MATERIALS AND EQUIPMENT NOT TO BE PAINTED

- A. Items of equipment furnished with complete factory finish, except for items specified to be given a finish coat under this Section.
- B. Non-ferrous metals, except for items specified and/or indicated to be painted.
- C. Finished hardware, except hardware that is factory primed.
- D. Unit masonry, unless otherwise noted.
- E. Surfaces not to be painted shall be left completely free of droppings and accidentally applied materials resulting from the work of this Section.

### 1.5 QUALITY ASSURANCE

- A. Job Mock-Up
  - 1. In addition to the samples specified herein to be submitted for approval, apply in the field, at their final location, each type and color of approved paint materials, applied 10 feet wide, floor to ceiling of wall surfaces, before proceeding with the remainder of the work, for approval by the Commissioner. Paint mock-ups to include door and frame assembly.
  - 2. These applications when approved will establish the quality and workmanship for the work of this Section.
  - 3. Repaint individual areas which are not approved, as determined by the Commissioner, until approval is received. Assume at least two paint mock-ups of each color and gloss for approval.
- B. Qualification of Painters: Use only qualified journeyman painters for the mixing and application of paint on exposed surfaces.

- C. Paint Coordination: Provide finish coats which are compatible with the prime paints used. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates. Upon request from other subcontractors, furnish information on the characteristics of the finish materials proposed to be used, to ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify the Commissioner in writing of any anticipated problems using the coating systems as specified with substrates primed by others.
- D. All paints must conform to the Volatile Organic Compounds (VOC) standards of prevailing codes and ordinances.

#### 1.6 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.

**B. Materials List**

1. Before any paint materials are delivered to the job site, submit to the Commissioner a complete list of all materials proposed to be furnished and installed under this portion of the work.
2. This shall in no way be construed as permitting substitution of materials for those specified or accepted for this work by the Commissioner.

**C. Samples**

1. Accompanying the materials list, submit to the Commissioner copies of the full range of colors available in each of the proposed products.
2. Upon direction of the Commissioner, prepare and deliver to the Commissioner two (2) identical sets of Samples of each of the selected colors and glosses painted onto 8-1/2" x 11" x 1/4" thick material; whenever possible, the material for Samples shall be the same material as that on which the coating will be applied in the work.

- D. Manufacturer's Recommendations:** In each case where material proposed is not the material specified or specifically described as an acceptable alternate in this Section of these specifications, submit for the Commissioner's review the current recommended method of application published by the manufacturer of the proposed material.

**1.7 LEED PERFORMANCE CRITERIA**

- A.** Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B.** All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.

- C.** Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

**1.8 PRODUCT HANDLING**

- A.** Deliver all paint materials to the job site in their original unopened containers with all labels intact and legible at time of use.

**B. Protection**

1. Store only the approved materials at the job site, and store only in a suitable and designated area restricted to the storage of paint materials and related equipment.
2. Use all means necessary to ensure the safe storage and use of paint materials and the prompt and safe disposal of waste.
3. Use all means necessary to protect paint materials before, during and after application and to protect the installed work and materials of all other trades.

- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

#### 1.9 EXTRA STOCK

- A. Upon completion of this portion of the Work, deliver to the City of New York an extra stock of paint equaling approximately ten (10) percent of each color and gloss used and each coating material used, with all such extra stock tightly sealed in clearly labeled containers.

#### 1.10 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F. and 90 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F. and 95 degrees F. unless otherwise permitted by the paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist; or when the relative humidity exceeds eighty-five (85) percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.
- D. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

## PART 2 PRODUCTS

### 2.1 PAINT MANUFACTURERS

- A. Except as otherwise noted, provide the painting products listed for all required painting made by one of the manufacturers listed in the paint schedule (Section 2.4) or approved equal. These companies are Benjamin Moore, Akzo Nobel Paint (Glidden Professional) and Sherwin Williams (S-W). Pratt and Lambert Paint. Comply with number of coats and required minimum mil thicknesses as specified herein.

### 2.2 MATERIALS

- A. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only to recommended limits.
- B. Colors and Glosses: All colors and glosses shall be as selected by the Commissioner. Certain colors will require paint manufacturer to prepare special factory mixes to match colors selected by the Commissioner. Color schedule (with gloss) shall be furnished by the Commissioner.
- C. Coloring Pigment: Products of or furnished by the manufacturer of the paint or enamel approved for the work.
- D. Linseed Oil: Raw or boiled, as required, of approved manufacture, per ASTM D 234 and D 260, respectively.
- E. Turpentine: Pure distilled gum spirits of turpentine, per ASTM D 13.

- F. Shellac: Pure gum shellac (white or orange) cut in pure denatured alcohol using not less than four (4) lbs. of gum per gallon of alcohol.
- G. Driers, Putty, Spackling Compound, Patching Plaster, etc.: Best quality, of approved manufacture.
- H. Heat Resistant Paint: Where required, use heat resistant paint when applying paint to heating lines and equipment.

### 2.3 GENERAL STANDARDS

- A. The various surfaces shall be painted or finished as specified below in Article 2.4. However, the Commissioner reserves the right to change the finishes within the range of flat, semi-gloss or gloss, without additional cost to the City of New York.
- B. All paints, varnishes, enamels, lacquers, stains and similar materials must be delivered in the original containers with the seals unbroken and label intact and with the manufacturer's instructions printed thereon.
- C. All painting materials shall bear identifying labels on the containers with the manufacturer's instructions printed thereon.
- D. Paint shall not be badly settled, caked or thickened in the container, shall be readily dispersed with a paddle to a smooth consistency and shall have excellent application properties.
- E. Paint shall arrive on the job color-mixed except for tinting of under-coats and possible thinning.
- F. All thinning and tinting materials shall be as recommended by the manufacturer for the particular material thinned or tinted.
- G. It shall be the responsibility of the Contractor to see that all mixed colors match the color selection made by the Commissioner prior to application of the coating.

### 2.4 SCHEDULE OF FINISHES

- A. High Performance Coating On Exterior Galvanized Ferrous Metals
  - First Coat: "27 Typoxy" or "N69 Epoxoline II" by Tnemec; "Intergard 345" by International Protective Coatings; "Carboguard 893 SG" or "Carboguard 888" by Carboline; or "Devran 203 WB Epoxy Primer" by Akzo.
  - Second Coat: "V73 Endura Shield" or "1074/1075" by Tnemec; "Interthane 870UHS" or "990 UHS" by International Protective Coatings; "Carbothane 133 LH" by Carboline; or "Devthane 379H Aliphatic Vizethne" by Akzo.
- B. High Performance Coating On Exterior Non-Galvanized Ferrous Metals (PT3X)
  - Prime Coat: "Tneme-Zinc 90/97" by Tnemec; "Interzinc 52" or "315" by International Protective Coatings; "Carbozinc 859, Class B" by Carboline; or "Cathacoat 302V Reinforced Inorganic Zinc Primer" by Akzo.
  - Second Coat: "27 Typoxy" or "N69 Epoxoline II" by Tnemec; "Intergard 345" by International Protective Coatings; "Carboguard 893 SG" or "Carboguard 888" by Carboline; or "Bar-Rust 231V Multi Purpose Epoxy Mastic" by AKZO.

Third Coat: "V73 Endura Shield" or "1074/1075" by Tnemec; "Interthane 870UHS" or "990 UHS" by International Protective Coatings; "Carbothane 133 LH" by Carboline; or "Devthane 379H Aliphatic Urethane" by Akzo.

C. Interior Ferrous Metal (PT3)

Satin Finish/Latex

Primer: 1 coat Moore Alkyd Metal Primer (Z06)  
 1 coat Akzo Devflex 4020 PF DTM Prime/Flat Finish or touch-up shop primer  
 1 coat Sherwin-Williams Pro Industrial Pro-CRVL Universal Primer B66-310  
 1 coat Pratt and Lambert Steeltech Acrylic Prime or Finish Z190

First Coat: 1 coat Water Borne Satin Impervo (314)  
 1 coat Akzo: Glidden Professional Diamond 350 Acrylic Eggshell 6P1403  
 1 coat S-W Proclastic Waterborne Acrylic Satin, B20  
 1 coat Pratt and Lambert Red Seal Latex Satin Enamel Z2300

Second Coat: 1 coat Water Borne Satin Impervo (314)  
 1 coat Akzo: Glidden Professional Diamond 350 Acrylic Eggshell 6P1403  
 1 coat S-W Proclastic Waterborne Acrylic Satin, B20  
 1 coat Pratt and Lambert Red Seal Latex Satin Enamel Z2300 or Pro-Hide Gold Interior Latex Satin Z9490

a. Total DFT not less than: 3.9 mils

Semi-Gloss Finish/Latex

Primer: 1 coat Iron Clad Latex Low Lustre Metal & Wood Enamel (363)  
 1 coat Akzo Devflex 4020 PF DTM Primer/Flat Finish or touch-up shop primer.  
 1 coat Sherwin-Williams, Pro Industrial Pro-CRVL Universal Primer B66-310

First Coat: 1 or 2 coats Pratt and Lambert; Steeltech Acrylic Prime or Finish Z190  
 1 coat Regal ICI Premium Interior 100% Acrylic Semi-gloss Finish (N333)  
 1 coat Akzo: Glidden Professional Diamond 350 Acrylic S/G 6P1407  
 1 coat S-W Proclastic Waterborne Acrylic Satin, B31

Second Coat: 1 coat Pratt and Lambert; Pro Hide gold Interior Latex Semi-Gloss Z8300  
 1 coat Regal Premium Interior 100% Acrylic Semi-gloss finish (N333)  
 1 coat Akzo: Glidden Professional Diamond 350 Acrylic S/G 6P1407  
 1 coat S-W Proclastic Waterborne Acrylic Satin, B31  
 1 coat Pratt and Lambert; Pro Hide Gold Interior Latex Semi-Gloss Z8300

a. Total DFT not less than: 4.0 mils

D. Interior Drywall (PT1)

Flat Finish/Vinyl Acrylic Latex

Primer: 1 coat Regal FirstCoat (216)  
 1 coat Akzo Glidden Professional Gripper GP 3210  
 1 coat S-W Pro Green 200 Interior Latex Primer, B28-600  
 1 coat Pratt and Lambert; Pro Hide Gold Interior Latex Wall Primer Z8160

First Coat: 1 coat Regal Wall Satin (215)  
 1 coat Akzo Glidden Professional Diamond 350 Flat GP 1201  
 1 coat S-W Pro Green 200 Interior Latex Flat, B30-600



- 1 coat Pratt and Lambert; Pro Hide Gold Interior Latex Flat Z8100  
 Second Coat: 1 coat Regal Wall Satin (215)  
 1 coat Akzo Glidden Professional Diamond 350 Flat GP 1201  
 1 coat S-W Pro Green 200 Interior Latex Flat, B30-600  
 1 coat Pratt and Lambert; Pro Hide Gold Interior Latex Flat Z8100  
 a. Total DFT not less than: 3.6 mils

## Eggshell Finish/Vinyl Acrylic Latex

- Primer: 1 coat Regal FirstCoat (216)  
 1 coat Akzo Glidden Professional Gripper GP 3210  
 1 coat S-W Pro Green 200 Interior Latex Primer, B28-600  
 1 coat Pratt and Lambert; Pro Hide Gold Interior Latex Wall Primer Z8160  
 First Coat: 1 coat Regal AquaVelvet (319)  
 1 coat Akzo Glidden Professional Diamond 350 Acrylic Eggshell GP 1403  
 1 coat S-W Pro Green 200 Interior Latex Egg-Shell, B20-600  
 1 coat Pratt and Lambert; Pro Hide Gold Interior Latex Eggshell Z8200  
 Second Coat: 1 coat Regal AquaVelvet (319)  
 1 coat Akzo Glidden Professional Diamond 350 Acrylic Eggshell GP 1403  
 1 coat S-W Pro Green 200 Interior Latex Egg-Shell, B20-600  
 1 coat Pratt and Lambert; Pro Hide Gold Interior Latex Eggshell Z8200  
 a. Total DFT not less than: 3.8 mils

## E. Exterior Gypsum Drywall (PT2); Soffit Board locations:

1. Factory-formulated flat acrylic-emulsion latex paint for exterior application: 2 finish coats over a primer.
2. Primer Coat: Latex-based exterior primer (Moorcraft Super Spec Alkyd Exterior Primer No. 176: Applied at a dry film thickness of not less than 1.8 mils)
3. Two Coats: Exterior Flat Latex Base Paint (Moorcraft Super Spec Flat Latex House Paint No. 171: Applied at a dry film thickness of not less than 1.2 mils)

## F. Wood (PT1):

1. 100% Acrylic Latex Finish: 2 finish coats.
  - a. Base/Finish Coat: Two coats of latex-based interior matte finish (Moore's "Aura Waterborne Interior Paint", 522).

## G. Interior Concrete Block Sealer (PT5): refer to Masonry Sealers – Section 04 20 00.

## H. Cast-in-Place Concrete: refer to Epoxy Resin Composition Flooring and Wall Finishes – Section 09 67 50.

## 2.5 PIPING AND MECHANICAL EQUIPMENT EXPOSED TO VIEW

- A. Paint all exposed piping, conduits, ductwork and mechanical and electrical equipment. Use heat resisting paint when applied to heating lines and equipment. The Contractor is cautioned not to paint or otherwise disturb moving parts in the mechanical systems. Mask or otherwise protect all parts as required to prevent damage.

- B. Exposed Uncovered Ductwork, Piping, Hangers and Equipment: Latex Enamel Undercoater and one (1) coat Acrylic Latex Flat.
- C. Exposed Covered Piping, Duct Work and Equipment: Primer/Sealer and one (1) coat Acrylic Latex Flat.
- D. Panel Boards, Grilles and Exposed Surfaces of Electrical Equipment: Latex Enamel Undercoater and two (2) coats Latex Semi-Gloss.
- E. Equipment or Apparatus with Factory-Applied Paint: Refinish any damaged surfaces to match original finish. Do not paint over name plates and labels.
- F. All surfaces of insulation and all other work to be painted shall be wiped or washed clean before any painting is started.
- G. All conduit, boxes, distribution boxes, light and power panels, hangers, clamps, etc., are included where painting is required.
- H. All items of Mechanical and Electrical trades which are painted shall be carefully coordinated with the work of this Section so as to leave no doubt as to what items are scheduled to be painted under this Section.

### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions where painting and finishing are to be applied and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

#### 3.2 GENERAL WORKMANSHIP REQUIREMENTS

- A. Only skilled mechanics shall be employed. Application may be by brush or roller. Spray application only upon acceptance from the Commissioner in writing.
- B. The Contractor shall furnish the Commissioner a schedule showing when he expects to have completed the respective coats of paint for the various areas and surfaces. This schedule shall be kept current as the job progresses.
- C. The Contractor shall protect his work at all times, and shall protect all adjacent work and materials by suitable covering or other method during progress of his work. Upon completion of the work, he shall remove all paint and varnish spots from floors, glass and other surfaces. He shall remove from the premises all rubbish and accumulated materials of whatever nature not caused by others and shall leave his part of the work in clean, orderly and acceptable condition.
- D. Remove and protect hardware, accessories, device plates, lighting fixtures, and factory finished work, and similar items, or provide ample in place protection. Upon completion of each space, carefully replace all removed items by workmen skilled in the trades involved.
- E. Remove electrical panel box covers and doors before painting walls. Paint separately and re-install after all paint is dry.
- F. All materials shall be applied under adequate illumination, evenly spread and flowed on smoothly to avoid runs, sags, holidays, brush marks, air bubbles and excessive roller stipple.

- G. Coverage and hide shall be complete. When color, stain, dirt or undercoats show through final coat of paint, the surface shall be covered by additional coats until the paint film is of uniform finish, color, appearance and coverage, at no additional cost to the City of New York.
- H. All coats shall be dry to manufacturer's recommendations before applying succeeding coats.
- I. Do not apply paint behind frameless mirrors that use mastic for adhering to wall surface.

### 3.3 PREPARATION OF SURFACES

- A. Existing Surfaces: Clean existing surfaces requiring paint or finishing, remove all loose and flaking paint or finish and sand surface smooth as required to receive new paint or finish. No "telegraphing" of lines, ridges, flakes, etc., through new surfacing is permitted. Where this occurs, Contractor shall be required to sand smooth and re-finish until surface meets with Commissioner's approval.
- B. General
  - 1. The Contractor shall be held wholly responsible for the finished appearance and satisfactory completion of painting work. Properly prepare all surfaces to receive paint, which includes cleaning, sanding, and touching-up of all prime coats applied under other Sections of the work. Broom clean all spaces before painting is started. All surfaces to be painted or finished shall be perfectly dry, clean and smooth.
  - 2. Perform all preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.
  - 3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.
- C. Metal Surfaces
  - 1. Weld Fluxes: Remove weld fluxes, splatters, and alkali contaminants from metal surfaces in an approved manner and leave surface ready to receive painting.
  - 2. Bare Metal: Thoroughly clean off all foreign matter such as grease, rust, scale and dirt before priming coat is applied. Clean surfaces, where solder flux has been used, with benzene. Clean surfaces by flushing with mineral spirits. For aluminum surfaces, wipe down with an oil free solvent prior to application of any pre-treatment.
    - a. Bare metal to receive high performance coating specified herein must be blast cleaned SSPC SP-6 prior to application if field applied primer; coordinate with steel trades furnishing ferrous metals to receive this coating to insure that this cleaning method is followed.
  - 3. Shop Primed Metal: Clean off foreign matter as specified for "Bare Metal." Prime bare, rusted, abraded and marred surfaces with approved primer after proper cleaning of surfaces. Sandpaper all rough surfaces smooth.
  - 4. Galvanized Metal: Prepare surface as per the requirements of ASTM D 6386.

5. Metal Filler: Fill dents, cracks, hollow places, open joints and other irregularities in metal work to be painted with an approved metal filler suitable for the purpose and meeting the requirements of the related Section of work; after setting, sand to a smooth, hard finish, flush with adjoining surface.
- D. Gypsum Drywall Surfaces: Scrape off all projections and splatters, spackles all holes or depressions, including taped and spackled joints, sand smooth. Conform to standards established in Section 092600, "Gypsum Drywall."
- E. Wood Surfaces: Sand to remove all roughness, loose edges, slivers, or splinters and then brush to remove dust. Wash off grease or dirt with an approved cleaner. Fill all cracks, splits, nail holes, screw holes, and surface defects with putty after the priming coat has been applied. Putty shall be brought up flush with the surface and sanded smooth and touched-up with primer when dry.
- F. Block Masonry Surfaces: Thoroughly clean off all grit, grease, dirt mortar drippings or splatters, and other foreign matter. Remove nibs or projections from masonry surfaces. Fill cracks, holes or voids, not filled under the "Masonry" Section, with Portland cement grout, and bag surface so that it has approximately the same texture as the adjacent masonry surface.
- G. Testing for Moisture Content: Contractor shall test all plaster, masonry, and drywall surfaces for moisture content using a reliable electronic moisture meter. Contractor shall also test latex type fillers for moisture content before application of top coats of paint. Do not apply any paint or sealer to any surface or to latex type filler where the moisture content exceeds seven (7) percent as measured by the electronic moisture meter.
- H. Touch-Up: Prime paint all patched portions in addition to all other specified coats.

#### 3.4 MATERIALS PREPARATION

- A. Mix and prepare painting materials in strict accordance with the manufacturer's directions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir all materials before application to produce a mixture of uniform density, and as required during the application of the materials. Do not stir any film which may form on the surface into the material. Remove the film and, if necessary, strain the material before using.
- D. Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are to be applied. Tint undercoats to match the color of the finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

#### 3.5 APPLICATION

- A. General
  1. Apply paint by brush or roller in accordance with the manufacturer's directions. Use brushes best suited for the type of material being applied. Use rollers of carpet, velvet back, or high pile sheep's wool as recommended by the paint manufacturer for material and texture required.

2. The number of coats and paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has completely dried. Sand between each enamel or varnish coat application with fine sandpaper, or rub surfaces with pumice stone where required to produce an even, smooth surface in accordance with the coating manufacturer's directions.
  3. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to insure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a film thickness equivalent to that of flat surfaces.
  4. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
    - a. "Exposed surfaces" is defined as those areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, etc., are in place in areas scheduled to be painted.
  5. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint, before final installation of equipment.
  6. Paint the back sides of access panels, removable or hinged covers to match the exposed surfaces.
  7. Finish doors on tops, bottoms, and side edges the same as the faces, unless otherwise indicated.
  8. Enamel finish applied to wood or metal shall be sanded with fine sandpaper and then cleaned between coats to produce an even surface.
  9. Paste wood filler applied on open grained wood after beginning to flatten, shall be wiped across the grain of the wood, then with a circular motion, to secure a smooth, filled, clean surface with filler remaining in open grain only. After overnight dry, sand surface with the grain until smooth before applying specified coat.
- B. Scheduling Painting
1. Apply the first coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  2. Allow sufficient time between successive coatings to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- C. Prime Coats: Re-coat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- D. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage.
- E. "Touching-Up" of Factory Finishes: Unless otherwise specified or shown, materials with a factory finish shall not be painted at the project site. To "touch-up," the

Contractor shall use the factory finished material manufacturer's recommended paint materials to repair abraded, chipped, or otherwise defective surfaces.

### 3.6 PROTECTION

- A. Protect work of other trades, whether to be painted or not, against damage by the painting and finishing work. Leave all such work undamaged. Correct any damages by cleaning, repairing or replacing, and repainting, as acceptable to the Commissioner.
- B. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

### 3.7 CLEAN UP

- A. During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each work day.
- B. Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION

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## SECTION 10 14 00

## SIGNAGE

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the identifying devices as shown on the drawings and/or specified herein, including but not necessarily limited to the following:

- 1. Identification signage.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Carpentry – Section 06 20 00.

## 1.4 QUALITY ASSURANCE

- A. For actual installation of the identifying devices, use only personnel who are thoroughly familiar with the manufacturer's recommended methods of installation and who are completely trained in the required skills.
- B. Sign and graphic components are to be by a single manufacturer, including necessary mounting options, fittings and fastenings.
- C. Finishes shall meet current Federal ADA and State requirements.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.



The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit manufacturer's technical data and installation instructions for each type of identifying device required.
- C. Samples: Submit samples of each identifying device showing finishes, colors, surface textures and qualities of manufacture and design of each sign component including graphics.
- D. Shop Drawings: Submit shop drawings for fabrication and erection of identifying devices. Include plans, elevations, and large scale details of sign wording and lettering layout. Show anchorage and accessory items. Furnish location template drawings for items supported or anchored to permanent construction.

## 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## 1.7 PRODUCT HANDLING

- A. Delivery and Storage
  - 1. Deliver all materials of this Section to the job site in their original unopened containers with all labels intact and legible at time of use.
  - 2. Store all materials under cover in a manner to prevent damage and contamination; store only the specified materials at the job site.
- B. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

## 1.8 PROJECT CONDITIONS

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

## PART 2 PRODUCTS

## 2.1 SIGNS

- A. General
  - 1. Basis of Design Product: 2/90 Modular by 2/90 Sign Systems, 5510 33rd St. S. E., Grand Rapids, MI 49512, (800) 777-4310, Fax (616) 949-5959.
  - 2. Other acceptable manufacturers: ASI Signage, Mohawk, Best Signs or approved equal.

## 2.2 SIGN TYPES

- A. General: The sign system is comprised of sign types families that are identified by letters and numbers which identify a particular group of sign components and sizes. An additional set of letters identifies a specific style of sign within that family.
- B. Room identification, women's and men's room identification and any other signs required by code, shall be selected by the Commissioner, to conform to Queens Library signage standards.
  - 1. Tactile Characters: Characters and Grade 2 Braille raised 1/32 inch above surfaces, in contrasting color.
- C. Typography
  - 1. Type Style: Copy shall be a true, clean, accurate reproduction of typeface selected by Commissioner. Upper and lower case or all caps and bold face as indicated in Sign Message Schedule. Letter spacing to be normal and interline spacing shall be set by manufacturer.
  - 2. Arrows, Symbols and Logo Art: To be provided in style, sizes, colors and spacing as shown in drawings.
  - 3. Braille: Grade 2.
  - 4. Translations: Grade 2 Braille copy, and text in additional languages, to be selected by Commissioner.
- D. Project Colors and Finishes
  - 1. Face: Photopolymer Face, in matte (non-glare) finish.
  - 2. Backing Plate: Acrylic.
  - 3. Sign Insert Background: Colors as selected by the Commissioner.
  - 4. End Cap/Frame: Slimline.
  - 5. Accents: Colors as selected by the Commissioner.
  - 6. Finishes: Matte, 11 to 19 degree on a 60 degree glossimeter.

## 2.3 FABRICATION

- A. Design components to allow for expansion and contraction for a minimum material temperature range of 56 degree C (100 degree F), without causing buckling, excessive opening of joints or over stressing of adhesives and fasteners.
- B. Form work to required shapes and sizes, with true curves, lines and angles. Provide necessary rebates, lugs and brackets for assembly of units.
- C. Contact surfaces of connected members be true. Assembled so joints will be tight and practically unnoticeable, without use of filling compound.

- D. Signs shall have fine, even texture and be flat and sound. Lines and miters sharp, arises unbroken, profiles accurate and ornament true to pattern. Plane surfaces be smooth flat and without oil-canning, free of rack and twist. Maximum variation from plane of surface plus or minus 0.015 inch. Restore texture to filed or cut areas.
- E. Level or straighten wrought work. Members shall have sharp lines and angles and smooth surfaces.
- F. Extruded members to be free from extrusion marks. Square turns and corners sharp, curves true.
- G. Conceal fastenings where possible. Exposed ends and edges mill smooth, with corners slightly rounded.
- H. All painted surfaces properly primed. Finish coating of paint to have complete coverage with no light or thin applications allowing substrate or primer to show. Finished surface smooth, free of scratches, gouges, drips, bubbles, thickness variations, foreign matter and other imperfections.
- I. Movable parts, including hardware, are to be cleaned and adjusted to operate as designed without binding or deformation of members. Doors and covers centered in opening of frame. All contact surfaces fit tight and even without forcing or warping components.
- J. Shop fabricate so far as practicable and pre-assemble items to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.

### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions where identifying devices is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

#### 3.2 INSTALLATION

- A. Install units and components at the locations directed by the Commissioner, securely mounted with concealed theft-resistant fasteners. Attach to substrates in accordance with the manufacturer's instructions.
- B. Install level, plumb, and at the proper height. Cooperate with other trades for installation of sign units to finish surfaces. Repair or replace damaged units as directed by the Commissioner.

END OF SECTION

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## SECTION 10 21 00

## FLOOR MOUNTED TOILET PARTITIONS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the floor mounted toilet partitions as shown on the drawings and/or specified herein.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Masonry Assemblies - Section 042000.
- C. Tile - Section 093000.
- D. Toilet Accessories - Section 102800.

## 1.4 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to fabrication to ensure proper fitting of the work.
- B. Inserts and Anchorages: Furnish inserts and anchoring devices which must be built into other work for the installation of toilet partitions and related work. Coordinate delivery with other work to avoid delay.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED

Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Shop Drawings: Before any of the materials of this Section are delivered to the job site, submit the following:
1. Room layouts and elevations for all areas, with dimensions based on actual dimensions taken at job site.
  2. Materials, finishes, details of construction, gauges of metal, hardware, fastening and anchoring conditions and relation to adjoining constructions.
- C. Samples: Submit the following:
1. One 12" x 12" sample of baked enamel finish for each color indicated.
  2. One sample of each type of hardware and fitting item including related fasteners. Include all items listed under 2.2 C. below.
- D. Templates: Submit templates to other trades as required for support of toilet partitions.

## 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## PART 2 PRODUCTS

### 2.1 TOILET PARTITIONS AND VISION SCREEN/TYPES AND MANUFACTURERS

- A. Provide floor mounted toilet partitions and vision screens of the types indicated, as manufactured by of the following, or approved equal:
  - 1. "Flushart" of Flush-Metal Partition Corp.
  - 2. "Normandie" of Sanymetal Products Co.
  - 3. "Luxor Type FT-700" of the Metpar Co.
- B. Manufacturer's name or identifying markings are not permitted on exposed surfaces of any metal toilet partition or vision screen, or related hardware.

### 2.2 URINAL SCREENS/TYPES AND MANUFACTURERS

- A. Provide wall mounted urinal screens of the types indicated, as manufactured by one of the following, or approved equal:
  - 1. "WH Wall Hung" of Flush Metal Partition Corp.
  - 2. "Type C Wall Hung" of Sanymetal Products Co.
  - 3. "Type T Wall Hung" of the Metpar Co.
- B. Manufacturer's name or identifying markings not permitted on exposed surfaces of urinal screens or related hardware.

### 2.3 MATERIALS FOR TOILET PARTITIONS AND SCREENS

- A. Stainless Steel Sheet: Prime quality ASTM A 666, Type 304 stainless steel.
- B. Core Insulation: Manufacturer's standard rot-proof and vermin-proof double faced honeycomb or corrugated type core material; required in all panels, screens, pilasters and doors.



- C. Hardware: Solid forged brass or stainless steel (Type 302 or 304), as indicated below. Stamped, cast alloy, or aluminum extrusions shall not be accepted.
1. Pilaster Shoes: Stainless steel, one piece (no visible joints or seams) flush or offset design, twenty (20) gauge.
  2. Hinges: Gravity hinge type, self-closing, concealed within door, fully adjustable, to bring door to rest in thirty (30) degree open position. Hinge brackets solid forged brass or stainless steel, with solid stainless steel pin and pintles.
  3. Latch: Solid forged brass with solid stainless steel slide.
  4. Strike and Keeper: One piece, solid forged brass or sixteen (16) gauge stainless steel, with rubber bumper mechanically applied and theft proof.
  5. Bumper Coat Hook: Solid forged brass, with ferrule held rubber bumper on back of each toilet compartment door.
  6. Stirrup Brackets: Fourteen (14) gauge stainless steel or forged brass.
  7. Hardware Finishes
    - a. On Forged Brass: Heavy chromium plating over nickel over copper. Satin Finish (US26D).
    - b. On Stainless Steel: No. 4, Satin Finish.
- D. Fasteners: Provide exposed fasteners of stainless steel or chromium plated brass, same finish as adjoining metal, theft proof. Provide concealed fasteners of non-corrosive metal.
- E. Furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters, to permit structural connection at floor. Furnish shoe at each pilaster to conceal anchorage.

## 2.4 FABRICATION

### A. Minimum Acceptable Metal Gauges

1. Face Sheets for Panels and Screens: Twenty (20) gauge steel sheet.
2. Face Sheets for Doors: Twenty-two (22) gauge steel sheet.
3. Face Sheets for Pilasters: Sixteen (16) gauge steel sheet for baked enamel finish, unless otherwise indicated.
  - a. For pilasters less than four (4) inches wide - fourteen (14) gauge.
4. Edge Moldings: Eighteen (18) gauge galvanized, bonderized steel.
5. Concealed Reinforcement: Fourteen (14) gauge galvanized steel for tapping and twelve (12) gauge galvanized steel for anchoring devices.

### B. Thicknesses

1. Panels, Screens and Doors: One (1) inch overall thickness.

2. Pilasters: 1-1/4" overall thickness.
- C. Sizes: As shown on drawings. Pilasters for compartments shall all be of the same width, except end pilasters which shall be approximately 1/2 the normal width.
- D. Construction
1. Panels, screens, doors and pilasters shall have face sheets, with formed edges, pressure cemented to each side of core insulation, providing flat, smooth surface, free of waves, warping, buckles or other defects.
  2. Lock edges of face sheets together by either concealed tack welding face sheets at contacting edges at eight (8) inches o.c. and installing interlocking edge molding, or by using a combination integral edge molding and internal reinforcing channel epoxy bonded to face sheets.
  3. Edge molding shall have corners mitered, welded or brazed, ground flush and finished to match adjacent surfaces. Corners, caps or exposed welds not permitted.
  4. Provide concealed reinforcement for hardware, grab bars, fastenings and accessories specified for in both work of this Section and in work of other Sections (such as Toilet Accessories), and for rigidity, strength and support of units in accordance with requirements of type and use of metal toilet partitions. Cut partitions in shop to receive toilet accessories, using templates furnished by Section 102800.
- E. Compartment Sizes: Unless otherwise indicated, minimum dimensions of components for toilet compartments shall be as follows:
1. Enclosure Height: 5'-10".
  2. Typical Door Width: 2'-0".
  3. Door Width for Barrier Free Compartments: 2'-10".
  4. Door Height: 4'-0".
  5. Floor Clearance: 1'-0".

## 2.5 FINISHES

- A. Bright, directional polish, No. 4.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where floor mounted toilet partitions are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Install work of this Section in a rigid and permanent manner, straight and plumb, with all horizontal lines level.
- B. Install panels and doors twelve (12) inches above finished floor, unless otherwise indicated. Toilet compartment doors shall be centered on water closets, unless otherwise indicated.
- C. Maintain uniform clearance of approximately 1/2" between pilasters and panels, and 1/2" between pilasters or panels and finished wall.
- D. Maintain uniform clearance of 1/4" or less between vertical edges of doors and pilasters.
- E. Set pilaster units with anchorages having not less than two (2) inches penetration into structural floor. Level, plumb, and tighten installation with devices furnished. Hang doors and adjust so that tops of doors are level with tops of pilasters when doors are in closed position.

END OF SECTION

SECTION 10 22 26  
OPERABLE PARTITIONS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the operable partitions as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Manually operated, paired panel partitions.

1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Carpentry – Section 06 20 00.

1.4 DEFINITIONS

- A. Retain abbreviations that remain after this Section has been edited.
- B. NIC: Noise isolation class.
- C. NRC: Noise reduction coefficient.
- D. NVLAP: National Voluntary Laboratory Accreditation Program.
- E. STC: Sound transmission class.

**1.5 SUBMITTALS**

- A. **LEED BUILDING Submittal Requirements:** Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed **GREEN BUILDING MATERIALS REPORTING FORM**. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the **GREEN BUILDING MATERIALS REPORTING FORM**.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies
- B. **Product Data:** Material descriptions, construction details, finishes, installation details, and operating instructions for each type of operable panel partition, component, and accessory specified. Include data on acoustical performance, surface-burning characteristics, and durability.
- C. **Shop Drawings:** Show location and extent of operable panel partitions. Include plans, elevations, sections, details, attachments to other construction, and accessories. Indicate dimensions; weights; conditions at openings and for storage; and required installation, storage, and operating clearances. Indicate location and installation requirements for hardware and track, and direction of travel. Show blocking to be provided by others. Include the following:

1. Calculations: Calculate requirements for supporting operable panel partitions and verify capacity of carriers and track components to support loads; indicate deflection limits for partition and adjacent construction.
  - D. Setting Drawings: For embedded items and cutouts required in other work, including support beam punching template.
  - E. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.
    1. Include similar Samples of accessories involving color selection.
  - F. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below and of same thickness and material indicated for the Work. If finishes involve normal color pattern and texture variations, include sample sets showing the full range of variations expected.
    1. Fabric: Full width by not less than 36-inch-long section of fabric from dye lot to be used for the Work, with specified treatments applied. Show complete pattern repeat.
    2. Panel Face Material: Manufacturer's standard-size unit, not less than 3 inches square.
    3. Panel Edge Material: Not less than full width by 3 inches long.
  - G. Product Certificates: Signed by manufacturers of operable panel partitions certifying that products furnished comply with requirements.
  - H. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
  - I. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
  - J. Product Test Reports: From a qualified testing agency indicating that each operable panel partition complies with requirements, based on comprehensive testing of current products.
  - K. Maintenance Data: For the following to include in maintenance manuals specified in Division 1:
    1. Panel face finishes and finishes for exposed trim and accessories. Include precautions for cleaning materials and methods that could be detrimental to finishes and performance.
    2. Seals, hardware, track, carriers, and other operating components.
- 1.6 LEED PERFORMANCE
- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.

- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is properly trained by the operable panel partition manufacturer as qualified to install the manufacturer's partition systems for work similar in material, design, and extent to that indicated for this Project.
- B. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:
  - 1. Sound Transmission Requirements: Operable panel partition assembly tested in a full-scale opening, 14 by 9 feet, for laboratory sound transmission loss performance according to ASTM E 90, determined by ASTM E 413, and rated for not less than the STC indicated.
- C. Warranty: Provide written warranty by manufacturer of operable partitions agreeing to repair or replace any components with manufacturing defects.
  - 1. Warranty period: Two (2) years.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

#### 1.9 PROJECT CONDITIONS

- A. Field Measurements: Verify operable panel partition openings and storage arrangements by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening and storage dimensions and proceed with fabricating operable panel partitions without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to established dimensions.

#### 1.10 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Panel-Face Finish Material: Furnish full-width in quantity to cover both sides of two panels when installed.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of Design Product: Acousti-Seal 932 by Modernfold, Inc.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. Advanced Equipment Corp.
  2. Foldoor/Holcomb & Hoke Mfg. Co., Inc.
  3. Hufcor Inc.
  4. Industrial Acoustics Co.
  5. Kwik-Wall Co.
  6. Moderco Inc.
  7. National Folding Wall Corp.
  8. Panelfold, Inc.

### 2.2 MATERIALS

- A. Steel Frame: Steel sheet, not less than 18-gage nominal specified thickness for uncoated steel.
- B. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use, corrosion resistance, and finish indicated; ASTM B 221 for extrusions; manufacturer's standard strengths and thicknesses for type of use.
  1. Frame Reinforcing: Manufacturer's standard steel or aluminum.
- C. Steel Face/Liner Sheets: Tension-leveled steel sheet, not less than 0.0239-inch nominal specified thickness for uncoated steel.
- D. Gypsum Board: ASTM C 36.
- E. Plywood: DOC PS 1.
- F. Particleboard: ANSI A208.1.
- G. Medium-Density Fiberboard: ANSI A208.2.

### 2.3 OPERABLE PANEL PARTITIONS

- A. Panel Construction: Panel shall be nominal 3 inch thick panels in manufacturer's standard 48-inch widths. All panel horizontal and vertical framing members shall be



fabricated from 18-gage formed steel with overlapped and welded corners for rigidity. Provide top reinforcement as required to support panel from suspension components and provide reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.

- B. Panel Skin: Roll-formed steel wrapping around panel edge. Panel skins shall be lock formed and welded directly to the frame for unitized construction.
- C. Acoustical rating of panels: 45 STC, minimum.
- D. Dimensions: Fabricate operable panel partitions, from manufacturer's standard sizes, to form an assembled system of dimensions indicated on Drawings and verified by field measurements.
- E. Trimless Edges: Fabricate exposed panel edges so finish facing wraps uninterrupted around panel, covering edge and resulting in an installed partition with facing visible on vertical panel edges, without trim, for minimal sightlines at panel-to-panel joints.
- F. Hinges: Full leaf butt hinges, attached directly to panel frame with welded hinge anchor plates within panel to further support hinge mounting to frame. Hinges mounted into panel edge or vertical astragal are not acceptable.

#### 2.4 SEALS

- A. General: Provide types of acoustical seals indicated that produce operable panel partitions complying with acoustical performance requirements and the following:
  - 1. Seals made from materials and profiles that minimize sound leakage.
  - 2. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended, closed, and in place.
- B. Vertical Seals: Deep-nesting, interlocking roll-formed steel astragals, with reversible tongue and groove configuration in each panel edge for universal panel operation. Rigid plastic astragals or astragals in only one panel edge are not acceptable.
- C. Horizontal Top Seals: Continuous-contact, extruded-vinyl bulb shape with pairs of non-contacting vinyl fingers to prevent distortion and no mechanically operated parts.
- D. Horizontal Bottom Seals: PVC-faced, mechanical, retractable, constant-force-contact seal exerting uniform constant pressure on floor when extended, ensuring horizontal and vertical sealing and resisting panel movement.
  - 1. Mechanically Operated: Extension and retraction of bottom seal by removable operating handle, with operating range not less than the 2-inch operating clearance between retracted seal and floor finish. Seal shall be operable from panel edge of face.
- E. Nose Jamb: Manual removable crank-operated expandable nose panel on leading edge with fixed wall jamb with same finish as panels.

## 2.5 FINISH FACING

- A. General: Provide finish facings that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.
1. Apply one-piece, seamless facings free from air bubbles, wrinkles, blisters, and other defects, with invisible seams complying with Shop Drawings for location, and with no gaps or overlaps. Horizontal seams are not permitted. Tightly secure and conceal raw and selvage edges of facing for finished appearance.
  2. Where facings with directional or repeating patterns or directional weave are indicated, mark facing top and attach facing in same direction.
  3. Match facing pattern 72 inches above finished floor.
- B. Fabric Wall Covering: Manufacturer's standard fabric, selected by the Commissioner, from same dye lot, treated to resist stains over full height ¼" natural cork tackboard. No trim or exposed fasteners.

## 2.6 SUSPENSION SYSTEMS

- A. Suspension Tracks: ModernFold #17 suspension system or approved equal: 11-gage, 0.12-inch roll-formed steel track, suitable for either direct mounting to a wood header or supported by adjustable steel hanger brackets, supporting the load-bearing surface of the track, connected to structural support by pairs of 3/8-inch diameter threaded rods. Aluminum track is not acceptable.
1. Exposed track soffit: Steel, integral to track, and with factory-applied, decorative, protective paint white.
  2. Carriers: One all-steel trolley with steel-tired ball bearing wheels per panel (except hinged panels). Non-steel tires are not acceptable.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine flooring, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable panel partitions. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Comply with ASTM E 557, operable panel partition manufacturer's written installation instructions, Drawings, and approved Shop Drawings.
- B. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed.

- C. Match operable panel partitions for color and pattern by installing panels from marked packages in numbered sequence indicated on Shop Drawings.
- D. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.

### 3.3 ADJUSTING

- A. Adjust operable panel partitions to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and other moving parts.

### 3.4 CLEANING AND PROTECTION

- A. Clean soiled surfaces, fabric facing on completing installation of operable panel partitions, to remove dust, loose fibers, adhesives, and other foreign materials according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure operable panel partitions are without damage or deterioration at time of Substantial Completion.
- C. Replace panels that cannot be cleaned and repaired, in a manner approved by Commissioner, before time of Substantial Completion.

### 3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to instruct Queens Library maintenance personnel to adjust, operate, and maintain operable panel partitions.
  - 1. Test and adjust seals, hardware, carriers, tracks, and other operable components. Replace damaged or malfunctioning operable components.
  - 2. Instruct Queens Library maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment and schedules.
  - 3. Review data in maintenance manuals. Refer to DDC General Conditions.
  - 4. Review data in maintenance manuals. Refer to DDC General Conditions.
  - 5. Schedule instruction with Queens Library with at least seven days' advance notice.

END OF SECTION

## SECTION 10 23 30

## FIRE EXTINGUISHERS AND CABINETS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the fire extinguishers and cabinets as shown on the drawings and/or specified herein.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Masonry walls - Section 04 20 00.
- C. Gypsum drywall - Section 09 29 00.
- D. Fire suppression systems - Division 22.
- E. Fire hose cabinets and valve cabinets - Division 22.

## 1.4 QUALITY ASSURANCE

- A. Provide portable fire extinguishers, cabinets and accessories by one manufacturer.
- B. UL-Listed Products: Provide new portable fire extinguishers which are UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification

items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit manufacturer's technical data and installation instructions for all portable fire extinguishers required. For fire extinguisher cabinets include roughing-in dimensions, and details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, style and materials. Where color selections by Commissioner are required, include color charts showing full range of manufacturer's standard colors and designs available.
- C. Samples: Submit samples, 6" square, of each required finish. Prepare samples on metal of same gauge as metal to be used in the work. Where normal color variations are to be expected, include 2 or more units in each sample showing the limits of such variations.

## 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products of one of the following:
  - 1. J.L. Industries.
  - 2. Larsen's Mfg. Co.
  - 3. Potter Roemer.
  - 4. or approved equal

### 2.2 EXTINGUISHERS

- A. General: Provide fire extinguishers for each extinguisher cabinet and other locations indicated, in colors and finishes selected by Commissioner from manufacturer's standard which comply with requirements of governing authorities.
- B. Abbreviations indicated below to identify extinguisher type related to UL classification and rating system and not necessarily to type and amount of extinguishing material contained in extinguisher.
- C. Multi-Purpose Dry Chemical Type: UL rated 2A-10B:C, 5 lb. nominal capacity, in enameled steel container, for Class A, Class B and Class C fires.

### 2.3 MOUNTING BRACKETS

- A. Provide manufacturer's standard bracket designed to prevent accidental dislodgment of extinguisher, of proper size for type and capacity of extinguisher specified, in manufacturer's standard enamel finish; color to match extinguisher.

## 2.4 CABINETS

- A. Type and Style: Fire extinguisher cabinets shall be metal, recessed, with stainless steel trim, clear acrylic panel, sized to fit within the partition or wall depth. Provide fire rated cabinets within fire rated partitions.
- B. Color: Fire extinguisher cabinets shall be factory pre-finished with baked enamel in the colors selected by the Commissioner from the standard range of colors of the selected manufacturer; door shall be stainless steel in #4 finish and clear acrylic panel.
- C. Design is based on "Model SS-2409-R1" of Larsen's Mfg. Co. Other manufacturers noted herein may substitute their equivalent cabinet upon acceptance by the Commissioner.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where fire extinguishers and cabinets are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 INSTALLATION

- A. Install items included in this Section in locations indicated and at heights to comply with applicable regulations of governing authorities.
  - 1. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
  - 2. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.
- B. Where exact location of cabinets and bracket-mounted fire extinguishers is not indicated, locate as directed by the Commissioner.

### 3.3 IDENTIFICATION

- A. Identify fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" painted on door by silk-screen process or die cut lettering. Provide lettering on door as selected by Commissioner from manufacturer's standard letter sizes, styles, colors and layouts.
- B. Identify bracket-mounted extinguishers with red letter decals spelling 'FIRE EXTINGUISHER' applied to wall surface. Letter size, style and location as selected by the Commissioner.

### 3.4 SERVICE

- A. Determine the approximate completion date of the work and then inspect, charge, and tag the fire extinguishers at a date not more than 10 days before or not less than one day before actual completion date of the work.

END OF SECTION

## SECTION 10 28 00

## TOILET ACCESSORIES

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the toilet accessories as shown on the drawings and/or specified herein.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Masonry - Section 04 20 00.
- C. Carpentry – Section 06 20 00.
- D. Ceramic tile - Section 09 30 00.
- E. Toilet Partitions - Section 10 21 00.

## 1.4 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.
- B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units. Accessories shall be installed at heights in compliance with prevailing Handicapped Code.
- C. Products: Unless otherwise noted, provide products of same manufacturer for each type of unit and for units exposed in same areas.



## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit manufacturer's technical data, catalogue cuts and installation instructions for each toilet accessory.
- C. Setting Drawings: Provide setting drawings, templates, instructions, and directions for installation of anchorage devices in other work
- D. Submit schedule of accessories indicating quantity and location of each item.

## 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## 1.7 PRODUCT HANDLING

- A. Deliver accessories to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type or material, manufacturer's name and brand name. Delivered materials shall be identical to approved samples.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gauge minimum, unless otherwise indicated.
- B. Brass: ASTM B 19 flat products; ASTM B 16, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Galvanized Steel Sheet: ASTM A 653, G60.
- D. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.
- E. Mirrors: ASTM C 1503, mirror glazing quality, clear glass mirrors, nominal 1/4" thick.

### 2.2 FASTENING DEVICES

- A. Exposed Fasteners: Theftproof type, chrome plated, or stainless steel; match finishes on which they are being used.
- B. Concealed Fasteners: Galvanized (ASTM A 123) or cadmium plated.
- C. No exposed fastening devices permitted on exposed frames.
- D. For metal stud drywall partitions, provide ten (10) gauge galvanized sheet concealed anchor plates for securing surface mounted accessories.

## 2.3 FABRICATION

- A. General: Stamped names or labels on exposed faces of toilet accessory units are not permitted. Unobtrusive labels on surfaces not exposed to view are acceptable. Where locks are required for a particular type of toilet accessory, provide same keying throughout project. Furnish two keys for each lock.
- B. Surface-Mounted Toilet Accessories, General: Fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage.
- C. Recessed Toilet Accessories, General: Fabricate units of all welded construction, without mitered corners. Hang doors of access panels with full-length stainless steel piano hinge. Provide anchorage which is fully concealed when unit is closed.

## 2.4 MANUFACTURERS

- A. Provide products manufactured by Bobrick Washroom Equipment Co., American Specialties, Inc., Bradley Corp., American Standard, or approved equal.

## 2.5 ACCESSORY SCHEDULE

- A. See Schedule on drawings.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where toilet accessories are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 PREPARATION

- A. Accessories which are to be partition mounted shall be closely coordinated with other trades, so that the necessary reinforcing is provided to receive the accessories.
- B. Furnish templates and setting drawings and anchor plates required for the proper installation of the accessories at gypsum drywall and masonry partitions. Coordinate the work to assure that base plates and anchoring frames are in the proper position to secure the accessories.
- C. Verify by measurements taken at the job site those dimensions affecting the work. Bring field dimensions which are at variance with those on the approved shop drawings to the attention of the Commissioner. Obtain decision regarding corrective measures before the start of fabrication of items affected.
- D. Cooperate in the coordination and scheduling of the work of this Section with the work of other Sections so as not to delay job progress.

### 3.3 INSTALLATION

- A. Install accessories at locations indicated on the drawings, using skilled mechanics, in a plumb, level and secure manner.

- B. Concealed anchor assemblies for gypsum drywall partitions shall be securely anchored to metal studs to accommodate accessories. Assemblies shall consist of plates and/or angles tack welded to studs.
- C. Secure accessories in place, at their designated locations by means of theftproof concealed set screws, so as to render removing of the accessory with a screwdriver impossible.
- D. Unless otherwise indicated, accessories shall conform to heights from the finished floor as shown on the drawings. Where locations are not indicated, such locations shall be as directed by the Commissioner.
- E. Installed accessories shall operate quietly and smoothly for use intended. Doors and operating hardware shall function without binding or unnecessary friction. Dispenser type accessories shall be keyed alike. Prior to final acceptance, master key and one duplicate key shall be given to City of New York's authorized agent.
- F. The Commissioner shall be the sole judge of workmanship. Workmanship shall be of the highest quality. Open joints, weld marks, poor connections, etc., will not be permitted. The Commissioner has the right to reject any accessory if he feels the workmanship is below the standards of this project.
- G. Grab bars shall be installed so that they can support a three hundred (300) lb. load for five minutes per ASTM F 446.

#### 3.4 CLEANING AND PROTECTION

- A. Upon completion of the installation, clean accessories of dirt, paint and foreign matter.
- B. During the installation of accessories and until finally installed and accepted, protect accessories with gummed canvas or other means in order to maintain the accessories in acceptable condition.
- C. Replace and/or repair installed work which is damaged or defective to the City of New York's satisfaction, at no additional cost.

END OF SECTION

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## SECTION 10 75 00

## FLAGPOLES

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: heat island effect, roof; use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SUMMARY

- A. This Section includes ground-set flagpoles made from aluminum.
- B. Related Sections include the following:
  - 1. Division 3 Section "Cast-in-Place Concrete" for concrete footings for flagpoles.
  - 2. Division 7 Section "Joint Sealants" for elastomeric sealant filling the top of the foundation tube.
  - 3. Division 01 – DDC General Conditions.

## 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide flagpole assemblies, including anchorages and supports, capable of withstanding the effects of wind loads, determined according to NAAMM FP 1001-07, "Guide Specifications for Design of Metal Flagpoles.
- B. Select one of two options in subparagraph below. Polyester flags exert approximately 40 percent higher loads on flagpoles than do nylon or cotton flags of same size.
  - 1. Base flagpole design on nylon flag of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

## 1.4 SUBMITTALS

- A. Product Data: For each type of flagpole required.

- B. Shop Drawings: Include elevations and details showing general arrangement, jointing, fittings and accessories, grounding, and anchoring and supporting systems.
    - 1. Include details of foundation system for ground-set flagpoles.
  - C. Structural Calculations: For flagpoles indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - D. Finish Samples for Verification: For each finished material used for flagpoles and accessories.
  - E. Qualification Data: For professional engineer.
- 1.5 QUALITY ASSURANCE
- A. Source Limitations: Obtain flagpole as a complete unit, including fittings, accessories, bases, and anchorage devices, from a single manufacturer.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. General: Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container. Store bare flagpoles in a dry location, protected from the weather and moisture, as recommended by the manufacturer.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. American Flagpole; a Kearney-National Inc. Company.
  - 2. Baartol Company Inc. (The)
  - 3. Concord Industries, Inc.
  - 4. Eder Flag Manufacturing Company, Inc.
  - 5. Ewing International.
  - 6. Lingo Inc.; Acme Flagpole Division.
  - 7. Michigan Flagpole Inc.
  - 8. Morgan-Francis Div.; Original Tractor Cab Co., Inc.
  - 9. PLP Composite Technologies, Inc.
  - 10. Pole-Tech Company Inc.

### 2.2 FLAGPOLES

- A. Flagpole Construction, General: Fabricate from seamless, extruded tubing complying with ASTM B 221, alloy 6063-T6, having a tensile strength not less than 30,000 psi with

a yield point of 25,000 psi. Heat treat after fabrication to comply with ASTM B 597, temper T6.

1. Provide cone-tapered flagpoles, per manufacturer's standard rate of taper.
- B. Exposed Height: 30 feet.
- C. Aluminum Flagpoles: Provide entasis-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241, Alloy 6063, with a minimum wall thickness of 3/16 inch. Heat treat after fabrication to comply with ASTM B 597, Temper T6.
- D. Foundation Tube: Fiberglass or PVC foundation sleeve, made to fit flagpole, for casting into concrete foundation.
1. Provide flashing collar of same material and finish as flagpole.

### 2.3 FITTINGS

- A. Finial Ball: Manufacturer's standard flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.
1. 0.063-inch spun aluminum, finished to match flagpole.
- B. External Halyard: Ball-bearing, nonfouling, revolving truck assembly of cast metal with continuous 5/16-inch-diameter, braided polypropylene halyard and 9-inch cast-aluminum cleats with stainless steel fasteners. Finish exposed metal surfaces to match flagpole.
1. Provide one halyard and one cleat at each flagpole.
  2. Provide cast-metal cleat covers, finished to match flagpole, secured with cylinder locks.
- C. Halyard Flag Snaps: Provide two stainless-steel swivel snap hooks per halyard.
1. Provide with neoprene or vinyl covers.
- D. Flash Collar: Provide Spun Aluminum Collar to match flagpole.

### 2.4 MISCELLANEOUS MATERIALS

- A. Concrete: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi.
- B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.
- C. Sand: ASTM C 33, fine aggregate.
- D. Elastomeric Joint Sealant: Multicomponent urethane joint sealant complying with requirements in Division 7 Section "Joint Sealants" for Use NT (nontraffic) and for Use M, G, A, and, as applicable to joint substrates indicated, O joint substrates.



2.5 FINISHES

- A. Metal Finishes, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Aluminum: Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
  - 1. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete.
- B. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms and foundation tube, sleeve, or anchor bolts in position, to prevent displacement during concreting.
- C. Place concrete immediately after mixing. Compact concrete in place by using vibrators. Moist-cure exposed concrete for not less than seven days or use nonstaining curing compound.
- D. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.2 FLAGPOLE INSTALLATION

- A. General: Install flagpoles where shown and according to Shop Drawings and manufacturer's written instructions.
- B. Foundation-Tube Installation: : Insert flagpole into installed foundation tube, turn to align truck assembly with the wind, plumb pole by filling remaining void with tamped dry sand. Seal top of foundation tube with a 2-inch (50 mm) layer of cement or waterproof compound and cover with flashing collar. Caulk collar perimeter.

END OF SECTION

SECTION 11 31 00

APPLIANCES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Refrigerator/freezers.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include operating characteristics, dimensions of individual appliances, and finishes for each appliance.
- B. Maintenance Data: For each product to include in maintenance manuals.
- C. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained by manufacturer for installation and maintenance of units required for this Project.
- B. Energy Ratings: Provide residential appliances that carry labels indicating energy-cost analysis (estimated annual operating costs) and efficiency information as required by the FTC Appliance Labeling Rule.
  - 1. Provide appliances that qualify for the EPA / DOE ENERGY STAR product labeling program.

1.5 DELIVERY AND STORAGE

- A. Deliver products to project site in manufacturer's undamaged protective containers. Store and protect all appliances and accessories to ensure that they will not be damaged internally or externally prior to installation.
- B. Delay delivery until spaces to receive them have been fully enclosed and utility rough-ins are complete. Install all appliances after module placement, where applicable.

1.6 WARRANTY

- A. Provide manufacturers 1 year standard warranties for each appliance.

PART 2 - PRODUCTS

2.1 APPLIANCES

- A. Provide appliances equal to products listed in "Appliance Schedule" on drawings, or approved equal of comparable features and quality.
- B. Manufacturers:
  - 1. Amana Appliances.
  - 2. Electrolux Home Products.
  - 3. Gaggenau.
  - 4. General Electric Company.
  - 5. Jenn-Air.
  - 6. KitchenAid.
  - 7. Maytag.
  - 8. Sub-Zero Freezer Co., Inc..
  - 9. Whirlpool Corporation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Utilities: Refer to Divisions 21 and 26 for plumbing and electrical requirements.

3.3 CLEANING AND PROTECTION

- A. Test each item of residential appliances to verify proper operation. Make necessary adjustments.
- B. Verify that accessories required have been furnished and installed.
- C. Remove packing material from residential appliances and leave units in clean condition, ready for operation.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to instruct Owner's maintenance personnel to adjust, operate, and maintain residential appliances. Refer to DDC General Conditions.

END OF SECTION

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SECTION 11 52 00  
PROJECTION SCREENS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the projection screens as shown on the drawings and/or specified herein.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Wood backing and trim for recessed screen installation - Section 06 20 00.
- C. Gypsum Board Assemblies – Section 09 26 00.
- D. Electrical wiring, connections, and installation of remote control switches for electrically operated projection screens - Division 26.

## 1.4 QUALITY ASSURANCE

- A. Provide each type of projection screen as a complete unit produced by a single manufacturer, including necessary mounting brackets, accessories, fittings and fastenings.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit copies of manufacturer's specifications and installation instructions for each type of projection screen unit.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 01 33 00.

- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 DELIVERY, STORAGE & HANDLING

- A. Do not deliver projection screens until building is enclosed and ready for screen installation. Protect screens from damage during delivery, handling, storage and installation.

### PART 2 PRODUCTS

#### 2.1 MANUALLY OPERATED, CEILING RECESSED, FRONT PROJECTION SCREENS

- A. Basis of Design Product: Access/Series M by Draper, Inc.
- B. Manufacturers: Provide projection screen equal to the basis of design product with the characteristics described below, by Da-Lite; Knox Mfg., Stewart Filmscreen; or approved equal.
- C. Type: Spring roller operated for recessed ceiling mounting installation consisting of case, screen, mounting accessories and other components necessary for complete installation.
- D. Factory or site installed roller: steel tube with heavy-duty spring and mounted on zinc plated brackets with double row radial ball bearings. Viewing surface securely attached to roller at top and at bottom hemmed around steel dowel.
- E. Screen Case: Extruded aluminum housing and stamped steel end caps. UL approved. Bottom closure panel forms slot for passage of viewing surface and is removable for access to viewing surface. Bottom perimeter flange provides support and trim for acoustical ceiling panels or gypsum board ceiling. Housing designed to be installed separately from roller/viewing surface assembly.
- F. Roller: Steel tube with heavy-duty spring and mounted on zinc plated brackets with double row radial ball bearings. Provide with pull cord.
  - 1. System Options:
    - a. Auto Return spring roller with built-in inertia reduction mechanism to ensure viewing surface retracts slowly, smoothly and quietly into case. Provide intermediate stop positions.
- G. Screen: Viewing surface securely attached to roller at top and at bottom hemmed around steel dowel.
  - 1. Screen size shall be 161 inch diagonal, 79 inches x 140 inches, HDTV Format (16:9)
- H. Screen Fabric: Manufacturer's standard, flame and mildew-resistant fabric, grey projection surface, High Contrast Grey.



PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where projection screens are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Install projection screen units and accessories at locations shown in accordance with manufacturer's instructions. Install level, plumb, secure and at proper height. Coordinate with other trades for securing projection screen units to finished surfaces. Repair or replace damaged units as directed by the Commissioner.
- B. Provide protections for installed units so that they will be in satisfactory operating condition, without damage at completion of project.

END OF SECTION

## SECTION 12 24 00

## WINDOW SHADES

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the window shades as shown on the drawings and/or specified herein, including but not limited to, the following:
  - 1. Window shades, manual and electric motor operations.
  - 2. Field measurements of as-built conditions.
  - 3. Accessories and hardware required for complete installation and operation.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Rough Carpentry – Section 06 20 00.
- C. Electrical - Division 26.

## 1.4 QUALITY ASSURANCE

- A. Provide assemblies which are complete assemblies produced by one manufacturer, including hardware, accessory items, mounting brackets, and fastenings.
- B. Provide materials in colors as selected by the Commissioner from manufacturer's standard colors.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
- B. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies
- C. Shop Drawings: Submit floor layout and elevations, indicating location of all window treatments, mechanism details, type and size of each unit, type and location of controls. Shop drawings must also show seaming of shade fabric. Submit shop drawings showing details of installation and relation to adjoining construction and conditions.
- D. Samples: Submit full size sample of each shade type for Commissioner's acceptance.
- E. Mock-Up
1. Install each type of shade assembly on one complete column bay for Commissioner's acceptance of installation details, workmanship and operation.
  2. Approved mock-up shall be used as the standard for installation of work under this Section, and no further installation work shall proceed before Commissioner's acceptance of the mock-up.

## 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 01 33 00.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## 1.7 MANUFACTURER'S WARRANTY

- A. Five (5) years against defects in quality or workmanship.

## 1.8 DELIVERY, STORAGE AND HANDLING

- A. Protect shades from damage, soiling and deterioration during transit, storage and handling to, until Owner's acceptance.

## PART 2 PRODUCTS

### 2.1 MANUALLY-OPERATED CEILING-RECESSED WINDOW SHADES

- A. Provide manually operated shade system equal to "Mecho/5 Pocket Drive-end Bracket" made by the Mecho-Shade Corp. or equal made by Sol-R-Veil Inc. or Kirsch Co. or approved equal conforming to standards specified herein.
- B. Shade system shall be a smooth operating chain and sprocket operated roller shade system which incorporates an adjustable slip clutch to control the rate of fall, from free running zero friction factor, to a factor of 100%. The shade may be adjusted to stop and hold at an infinite number of positions, or adjustable at any percentage of friction to control the fall rate of the shade as required. The shade position when set as a free fall system to be mechanical, by use of a chain retainer. At either setting the highest and lowest shade position will have an automatic stop to prevent overwinding or unrolling. The window shade mechanism shall have sufficient latitude to accommodate small lightweight shades, as well as large heavy shades compatible with glass sizes in the building.
- C. Shade mounting brackets shall be made of 1/8" thick sheet steel and a 7/16" welded steel shaft which shall be the axis for the entire sprocket and spring clutch assembly. Reversible for left hand or right hand operation. Wall, jamb, or ceiling mounted as required, shall be permanently installed with the mechanism concealed from view when fully assembled. Delrin cover plate shall be mechanically attached to sheet steel. Injection molded Delrin cover plate is provided for each of the brackets to conceal the metal brackets from view, provide means of attaching a fabric without exposed hardware, and guide and retain the chain gear assembly. Brackets to act as protective retainer for tube and shade assembly preventing accidental dislocation of tube and

shade by vibration, rough usage. The bracket assembly to be permanently mounted to the building; shade tube and fascia are removable.

- D. SnapLoc Tube: Extruded 6063-XT6 aluminum, 1-1/2" o.d., either end of tube to engage drive system through internal extruded keyway. Tube shall be extruded with two fabric mounting channels which shall provide anti-deflection support for wide span shades. All tubes removable, interchangeable without removing the drive assembly, block resetting, or readjusting the pre-set stops. Shade tube to be self aligning and self leveling.
- E. SnapLoc Fabric Mounting Spline: Spline to be of extruded vinyl with symmetrical insertion locking channels and embossed fabric guide. Spline shall have sufficient capacity to hold heavy shades when spline is snapped and locked into the tube. Fabric shade shall be readily removable without removing the tube from the retainer brackets, or removing the brackets from the wall.
- F. Fabric-Guide End Cap: Delrin end cap shall have steel pin which permits up to 5/16" lateral adjustment in tube width. End cap shall have 2-1/4" o.d. fabric-guide tapered disc feature to assure alignment and protection of the shade cloth.
- G. Finishes: All exposed aluminum parts have an anodized finish. Steel parts are either nickel plated, satin finish, or have been bonderized prior to painting with a baked, enamel finish.

## 2.2 MOTORIZED WINDOW SHADES

- A. Provide "Electro/1 without Fascia" system made by the Mecho-Shade Corp., or equal made by Sol-R-Veil, Kirsch or approved equal.
- B. Motor Control System
  - 1. All motors shall be provided power via individual 3 conductor line voltage circuits connecting each motor to the IQ/MLC's.
  - 2. A maximum of four motors may be operated by a single IQ/MLC control component.
  - 3. Control system components shall provide appropriate (spike and brown out) over current protection (+/- 10% of line voltage) for each of these four individual circuits and shall be rated by UL or ETL as a component of this system.
  - 4. Motor control system shall allow each IQ/MLC group of four shade motors to be controlled by each of four local switch ports, with up to fourteen possible "sub-group" combinations via local 3 button wall switches and all at once via a master 3 button switch. System shall allow for overlapping switch combinations from 2 or more switches.
  - 5. Multiple "sub-groups" from different IQ/MLC control components may be combined to form "groups" operated by a single 3 button wall switch.
  - 6. Each shade motor shall be accessible (for control purposes) from up to four local switches and one master switch.
  - 7. Control system shall allow for automatic alignment of shade hembars at 25%, 50% and 75% of opening heights, or up to three user defined intermediate stopping positions in addition to all up/all down positions regardless of shade height.

Control system shall allow shades to be stopped at any point in the opening height, however, shade hembars may not be in alignment at these non-defined positions.

8. Control system shall have two standard operating modes, Normal Mode allow the shades to be stopped anywhere in the opening height and Uniform Mode allow the shades to only be stopped at the pre-defined intermediate stop positions. Both modes shall allow for all up/all down positioning.
  9. Control system components shall allow for interface with low voltage Audio Visual system components via a dry contact terminal block.
- C. Provide brackets, anchors and hardware required for complete installation and operation and conforming to standards specified in Article 2.1.

### 2.3 SHADE CLOTH

- A. Shade cloth shall be "Euro-Veil" of weave and optical properties as selected by the Commissioner made by Mecho-Shade or equal by other manufacturers noted herein.
1. Shade cloth shall have 1" hemtube with 5/8" rebar sealed inside bottom of shade cloth.

### 2.4 FABRICATION

- A. The shade and the fabric shall hang flat without buckling or distortion. The edge, when trimmed, shall hang straight without curling or raveling. An unguided roller shade cloth shall roll true and straight, without shifting sideways more than +/- 1/8" in either direction due to warp distortion or weave design. All shades shall be fabricated with concealed hem weights in the hem in accordance with the manufacturer's specifications to assure a properly installed window shading system.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where window treatments are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 INSTALLATION

- A. Coordinate with the work of other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install the work of this Section in strict accordance with the indicated design and the installation recommendations of the manufacturer as approved by the Commissioner.
- C. Upon completion of the installation, put all components through at least ten (10) complete cycles of operation, adjusting as necessary to achieve optimum operation.

### 3.3 PROTECTION AND CLEANING

- A. Protect installed units to ensure proper operating condition, without damage or blemishes. Repair or replace damaged units as directed by the Commissioner.

END OF SECTION

## SECTION 12 48 14

## FLOOR MATS AND FRAMES

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the floor mats and frames as shown on the drawings and specified herein.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Concrete recess - Section 03 30 00.

## 1.4 QUALITY ASSURANCE

- A. Manufacturer: Except as otherwise indicated, provide entrance mats and accessories by a single manufacturer for entire project.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).



- b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit manufacture's specifications and installation instructions or entrance mat. Include methods of installation for each type of substrate.
  - C. Samples: Submit samples for each type and color of exposed entrance mat, frames and accessories required. Provide 12" square samples of mat including frame.
  - D. Shop Drawings: Provide in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.
  - E. Maintenance Data: Submit manufacturer's printed instructions for cleaning, drying, maintaining and rehandling of removable entrance mat units.

#### 1.6 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.

- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

### PART 2 - PRODUCTS

#### 2.1 MAT ASSEMBLY

- A. Basis of Design Product: Stainless steel SSS Clean Tread Model KD58 Floor Grate by Kadee Industries.
- B. Manufacturers: Provide entrance matt and frame assembly equal to the basis of design product with the characteristics described below:
  - 1. Construction Specialties, Inc. (G6 Gridline 5/8");
  - 2. J.L Industries (JL-508);
  - 3. Arden Architectural Specialties (SS-58G);
  - 4. or approved equal.
- C. Tread Material: Type 304 Stainless Steel; 0.071" (0.093") x 0.177" (0.149") wire, min. Standard slot opening shall be no greater than 0.145".
- D. Support Rods: Type 304 Stainless Steel; 0.5" rods, min. spaced 1" O.C.
- E. Surface Finish: #4 satin.
- F. Frames shall be 304 stainless steel angle or extruded aluminum (6063-T6).
  - 1. Level Bed application: Tread support rods must rest directly on the recessed floor.
- G. Hidden locking devices made from Type 304 stainless steel shall be used to prevent warping and rattling. The number of lockdowns to be used shall be in accordance with the manufacturer's recommendations.

#### 2.2 FABRICATION

- A. Shop fabricate floor grates to greatest extent possible in sizes shown. Where not otherwise shown, provide single unit for each grate installation, but do not exceed manufacturer's maximum size recommendation for units intended for removal and cleaning. Where possible, contractor must verify field measurement sizes before shop fabrication.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where floor mats and frames are to be installed and notify the Commissioner of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Where possible, install mat frames integrally with principal pour of concrete floor system. Locate, align and level frame members accurately.
- B. Protection: Upon completion of frame installations and concrete work, provide temporary filler of plywood or fiberboard in mat recesses, and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and project reaches substantial completion.
- C. Delay installation of mats until work on the project reaches substantial completion.
- D. Install grating mat in frame and anchor with hidden lock downs.
- E. Fabricate units in shop to greatest extent possible. Verify sizes by field measurement before fabrication where possible; do not delay job progress.

END OF SECTION

## SECTION 220500

## COMMON WORK RESULTS FOR PLUMBING

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. This Section includes the following:

1. Piping materials and installation instructions common to most piping systems.
2. Dielectric fittings.
3. Mechanical sleeve seals.
4. Sleeves.
5. Escutcheons.
6. Grout.
7. Plumbing demolition.
8. Equipment installation requirements common to equipment sections.
9. Concrete bases.
10. Supports and anchorages.

## 1.2 DEFINITIONS

- A. Finished Spaces: Spaces other than plumbing and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and plumbing equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

## 1.3 PERFORMANCE AND SUBMITTALS

## A. LEED Building Requirements

1. General Requirements:  
The City of New York requires the Contractor to implement practices and procedures to meet the project's environmental goals, which include achieving a LEED™ Green Building rating. Specific project goals which may impact this area of work are listed in the applicable paragraphs of this specification section. The

Contractor shall ensure that the requirements related to these goals, 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, shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

2. Performance Criteria

All field applied adhesives, sealants (used as fillers), prime painting, and finished painting shall comply with the low VOC requirements called out in Division 1, Section 018113.13 - Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, & Architectural Coatings, and Section 099000 - Painting and Finishing.

B. LEED Building Submittal Requirements:

1. Provide for all field-applied adhesives, sealants (used as fillers), and paints: Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall 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).

C. Welding certificates.

1.4 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."  
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- C. Electrical Characteristics for Plumbing Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

PART 2 - PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

- A. Refer to individual Division 22 piping Sections for pipe, tube, and fitting materials and joining methods.

- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

## 2.2 JOINING MATERIALS

- A. Refer to individual Division 22 piping Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.
- C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- E. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.
- F. Welding Filler Metals: Comply with AWS D10.12.
- G. Solvent Cements for Joining Plastic Piping:
  - 1. ABS Piping: ASTM D 2235.
  - 2. CPVC Piping: ASTM F 493.
  - 3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
  - 4. PVC to ABS Piping Transition: ASTM D 3138.

## 2.3 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig (1725-kPa) minimum working pressure at 180 deg F (82 deg C).
- D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 300-psig (1035- or 2070-kPa) minimum working pressure as required to suit system pressures.
- E. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).
- F. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

## 2.4 MECHANICAL SLEEVE SEALS

- A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.
- B. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
- C. Pressure Plates: Carbon steel. Include two for each sealing element.
- D. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

## 2.5 SLEEVES

- A. Galvanized-Steel Sheet: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.
- B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
  - 1. Underdeck Clamp: Clamping ring with set screws.

## 2.6 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.
- C. One-Piece, Cast-Brass Type: With set screw.
  - 1. Finish: Polished chrome-plated and rough brass.
- D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
  - 1. Finish: Polished chrome-plated and rough brass.

## 2.7 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

## PART 3 - EXECUTION

### 3.1 PLUMBING DEMOLITION

- A. Refer to DDC General Conditions and Division 02 Section "Selective Structure Demolition" for general demolition requirements and procedures.
- B. Disconnect, demolish, and remove plumbing systems, equipment, and components indicated to be removed.
  1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
  2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
  3. Equipment to Be Removed: Disconnect and cap services and remove equipment.
  4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
  5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

### 3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 22 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.



- F. Install piping to permit valve servicing.
- G. Install piping at indicated slopes.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install piping to allow application of insulation.
- K. Select system components with pressure rating equal to or greater than system operating pressure.
- L. Install escutcheons for penetrations of walls, ceilings, and floors.
- M. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
- N. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
  - 1. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.
  - 2. Install cast-iron "wall pipes" for sleeves 6 inches (150 mm) and larger in diameter.
  - 3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- O. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
  - 1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- P. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.
- Q. Verify final equipment locations for roughing-in.
- R. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

### 3.3 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 22 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

### 3.4 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
  - 1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment.
  - 2. Install flanges, in piping NPS 2-1/2 (DN 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment.
  - 3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
  - 4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

### 3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- C. Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.

### 3.6 CONCRETE BASES

- A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
  - 1. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit.
  - 2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of the base.
  - 3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
  - 4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 5. Install anchor bolts to elevations required for proper attachment to supported equipment.
  - 6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
  - 7. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Miscellaneous Cast-in-Place Concrete."

### 3.7 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to Division 05 Section "Metal Fabrications" for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor plumbing materials and equipment.
- C. Field Welding: Comply with AWS D1.1.

### 3.8 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor plumbing materials and equipment.
- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

3.9 GROUTING

- A. Mix and install grout for plumbing equipment base bearing surfaces, pump and other equipment base plates, and anchors.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms as required for placement of grout.
- D. Avoid air entrapment during placement of grout.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases and provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout.

END OF SECTION 220500

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SECTION 220523

GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reduce pressure zone backflow preventer.
2. Brass ball valves.
3. Bronze ball valves.
4. Bronze swing check valves.
5. Bronze gate valves.
6. Bronze globe valves.

B. Related Sections:

1. Division 22 plumbing piping Sections for specialty valves applicable to those Sections only.
2. Division 22 Section "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

1.2 SUBMITTALS

- A. Product Data: For each type of valve indicated.

1.3 QUALITY ASSURANCE

- A. ASME Compliance: ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
- B. NSF Compliance: NSF 61 for valve materials for potable-water service.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Refer to valve schedule articles for applications of valves.
- B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- C. Valve Sizes: Same as upstream piping unless otherwise indicated.
- D. Valve Actuator Types:
1. Gear Actuator: For quarter-turn valves NPS 8 (DN 200) and larger.

2. Handwheel: For valves other than quarter-turn types.
  3. Handlever: For quarter-turn valves NPS 6 (DN 150) and smaller.
  4. Chainwheel: Device for attachment to valve handwheel, stem, or other actuator; of size and with chain for mounting height, as indicated in the "Valve Installation" Article.
- E. Valves in Insulated Piping: With 2-inch (50-mm) stem extensions and the following features:
1. Gate Valves: With rising stem.
  2. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
  3. Butterfly Valves: With extended neck.
- F. Valve-End Connections:
1. Flanged: With flanges according to ASME B16.1 for iron valves.
  2. Solder Joint: With sockets according to ASME B16.18.
  3. Threaded: With threads according to ASME B1.20.1.
- 2.2 REDUCED PRESSURE ZONE BACKFLOW PREVENTER
- A. Provide Backflow Preventers conforming to AWWA ANSI B16.1 and ASSE Standard 1013.
- B. On Domestic Water: Reduced pressure zone assembly consisting of two independently operated spring-loaded center guided check valves and one hydraulically dependent differential relief valve, two full port ball valves and four resilient seated ball valve test cocks similar to Wilkins 975XL. Install and maintained in accordance with NYC DEP Cross-Connection Control Unit, Department of Health and Water Authority requirements.
- 2.3 BRASS BALL VALVES
- A. Two-Piece, Full-Port, Brass Ball Valves with Brass Trim:
1. Manufacturers: Subject to compliance with requirements:
    - a. Crane Co.; Crane Valve Group; Crane Valves.
    - b. Crane Co.; Crane Valve Group; Jenkins Valves.
    - c. DynaQuip Controls.
    - d. Flow-Tek, Inc.; a subsidiary of Bray International, Inc.
    - e. Hammond Valve.
    - f. Jamesbury; a subsidiary of Metso Automation.
    - g. Jomar International, LTD.
    - h. Kitz Corporation.
    - i. Legend Valve.
    - j. Marwin Valve; a division of Richards Industries.
    - k. Milwaukee Valve Company.
    - l. NIBCO INC.
  2. Description:

- a. Standard: MSS SP-110.
- b. SWP Rating: 150 psig (1035 kPa).
- c. CWP Rating: 600 psig (4140 kPa).
- d. Body Design: Two piece.
- e. Body Material: Forged brass.
- f. Ends: Threaded.
- g. Seats: PTFE or TFE.
- h. Stem: Brass.
- i. Ball: Chrome-plated brass.
- j. Port: Full.

## 2.4 BRONZE BALL VALVES

### A. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim:

#### 1. Manufacturers:

- a. American Valve, Inc.
- b. Conbraco Industries, Inc.; Apollo Valves.
- c. Crane Co.; Crane Valve Group; Crane Valves.
- d. Hammond Valve.
- e. Lance Valves; a division of Advanced Thermal Systems, Inc.
- f. Legend Valve.
- g. Milwaukee Valve Company.
- h. NIBCO INC.
- i. Red-White Valve Corporation.
- j. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

#### 2. Description:

- a. Standard: MSS SP-110.
- b. SWP Rating: 150 psig (1035 kPa).
- c. CWP Rating: 600 psig (4140 kPa).
- d. Body Design: Two piece.
- e. Body Material: Bronze.
- f. Ends: Threaded.
- g. Seats: PTFE or TFE.
- h. Stem: Bronze.
- i. Ball: Chrome-plated brass.
- j. Port: Full.

## 2.5 BRONZE GATE VALVES

### A. Class 125, RS Bronze Gate Valves:

#### 1. Manufacturers:

- a. American Valve, Inc.
- b. Crane Co.; Crane Valve Group; Crane Valves.
- c. Crane Co.; Crane Valve Group; Jenkins Valves.
- d. Crane Co.; Crane Valve Group; Stockham Division.
- e. Hammond Valve.
- f. Kitz Corporation.



- g. Milwaukee Valve Company.
- h. NIBCO INC.
- i. Powell Valves.
- j. Red-White Valve Corporation.
- k. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:

- a. Standard: MSS SP-80, Type 1.
- b. CWP Rating: 200 psig.
- c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
- d. Ends: Threaded.
- e. Stem: Bronze.
- f. Disc: Solid wedge; bronze.
- g. Packing: Asbestos free.
- h. Handwheel: Malleable iron.

2.6 BRONZE GLOBE VALVES

A. Class 125, Bronze Globe Valves with Bronze Disc:

1. Manufacturers:

- a. Crane Co.; Crane Valve Group; Crane Valves.
- b. Crane Co.; Crane Valve Group; Stockham Division.
- c. Hammond Valve.
- d. Kitz Corporation.
- e. Milwaukee Valve Company.
- f. NIBCO INC.
- g. Powell Valves.
- h. Red-White Valve Corporation.
- i. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
- j. Zy-Tech Global Industries, Inc.

2. Description:

- a. Standard: MSS SP-80, Type 1.
- b. CWP Rating: 200 psig (1380 kPa).
- c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
- d. Ends: Threaded.
- e. Stem and Disc: Bronze.
- f. Packing: Asbestos free.
- g. Handwheel: Malleable iron, bronze, or aluminum

PART 3 - EXECUTION

3.1 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.

- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.

### 3.2 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

### 3.3 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valve applications are not indicated, use the following:
  - 1. MICV and MOCV: Gate valves.
  - 2. Shutoff Service: Ball valves
  - 3. Throttling Service: Globe or ball or butterfly valves.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.
- C. Select valves, except wafer types, with the following end connections:
  - 1. For Copper Tubing, NPS 2 (DN 50) and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.

### 3.4 DOMESTIC, HOT- AND COLD-WATER VALVE SCHEDULE

- A. Pipe NPS 2 (DN 50) and Smaller:
  - 1. Bronze and Brass Ball Valves: May be provided with solder-joint ends instead of threaded ends.
  - 2. Bronze Angle Valves: Class 125, bronze disc.
  - 3. Ball Valves: Two piece, full port, brass or bronze with brass bronze trim; chrome plated bronze ball.
  - 4. Bronze Swing Check Valves: Class 125, bronze disc.
  - 5. Bronze Gate Valves: Class 125, NRS .
  - 6. Bronze Globe Valves: Class 125, bronze disc.

END OF SECTION 220523

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SECTION 220529

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
  - 1. Steel pipe hangers and supports.
  - 2. Trapeze pipe hangers.
  - 3. Metal framing systems.
  - 4. Thermal-hanger shield inserts.
  - 5. Fastener systems.
  - 6. Equipment supports.
- B. See Division 05 Section "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
- C. See Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment" for vibration isolation devices.

1.2 DEFINITIONS

- A. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.3 PERFORMANCE REQUIREMENTS

- A. Provide supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
- B. Provide equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Provide seismic-restraint hangers and supports for piping and equipment.

1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Steel pipe hangers and supports.
  - 2. Thermal-hanger shield inserts.
  - 3. Powder-actuated fastener systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:

1. Trapeze pipe hangers. Include Product Data for components.
2. Metal framing systems. Include Product Data for components.
3. Equipment supports.

C. Welding certificates.

## 1.5 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
  2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

### 2.2 STEEL PIPE HANGERS AND SUPPORTS

- A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.
- B. Manufacturers:
1. AAA Technology & Specialties Co., Inc.
  2. Bergen-Power Pipe Supports.
  3. B-Line Systems, Inc.; a division of Cooper Industries.
  4. Carpenter & Paterson, Inc.
  5. Empire Industries, Inc.
  6. ERICO/Michigan Hanger Co.
  7. Globe Pipe Hanger Products, Inc.
  8. Grinnell Corp.
  9. GS Metals Corp.
  10. National Pipe Hanger Corporation.
  11. PHD Manufacturing, Inc.
  12. PHS Industries, Inc.
  13. Piping Technology & Products, Inc.
  14. Tolco Inc.
- C. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.
- D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

- E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

## 2.3 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

## 2.4 METAL FRAMING SYSTEMS

- A. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.

- B. Manufacturers:

1. B-Line Systems, Inc.; a division of Cooper Industries.
2. ERICO/Michigan Hanger Co.; ERISTRUT Div.
3. GS Metals Corp.
4. Power-Strut Div.; Tyco International, Ltd.
5. Thomas & Betts Corporation.
6. Tolco Inc.
7. Unistrut Corp.; Tyco International, Ltd.

- C. Coatings: Manufacturer's standard finish, unless bare metal surfaces are indicated.

- D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

## 2.5 THERMAL-HANGER SHIELD INSERTS

- A. Description: 100-psig- (690-kPa-) minimum, compressive-strength insulation insert encased in sheet metal shield.

- B. Manufacturers:

1. Carpenter & Paterson, Inc.
2. ERICO/Michigan Hanger Co.
3. PHS Industries, Inc.
4. Pipe Shields, Inc.
5. Rilco Manufacturing Company, Inc.
6. Value Engineered Products, Inc.

- C. Insulation-Insert Material for Cold Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass with vapor barrier.

- D. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass.

- E. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

- F. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- G. Insert Length: Extend 2 inches (50 mm) beyond sheet metal shield for piping operating below ambient air temperature.

## 2.6 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

- 1. Manufacturers:

- a. Hilti, Inc.
- b. ITW Ramset/Red Head.
- c. Masterset Fastening Systems, Inc.
- d. MKT Fastening, LLC.
- e. Powers Fasteners.

- B. Mechanical-Expansion Anchors: Insert-wedge-type **zinc-coated** steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

- 1. Manufacturers:

- a. B-Line Systems, Inc.; a division of Cooper Industries.
- b. Empire Industries, Inc.
- c. Hilti, Inc.
- d. ITW Ramset/Red Head.
- e. MKT Fastening, LLC.
- f. Powers Fasteners.

## 2.7 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

## 2.8 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.

- 1. Properties: Nonstaining, noncorrosive, and nongaseous.
- 2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

## PART 3 - EXECUTION

## 3.1 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use padded hangers for piping that is subject to scratching.
- F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750).
  - 2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg F (49 to 232 deg C) pipes, NPS 4 to NPS 16 (DN 100 to DN 400), requiring up to 4 inches (100 mm) of insulation.
  - 3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24 (DN 20 to DN 600), requiring clamp flexibility and up to 4 inches (100 mm) of insulation.
  - 4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8 (DN 15 to DN 200).
  - 5. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750).
  - 6. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36 (DN 100 to DN 900), with steel pipe base stanchion support and cast-iron floor flange.
  - 7. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30 (DN 25 to DN 750), from 2 rods if longitudinal movement caused by expansion and contraction might occur.
  - 8. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42 (DN 50 to DN 1050), if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
- G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500).
  - 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500), if longer ends are required for riser clamps.



- H. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.
  2. Steel Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.
- I. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
  2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction to attach to top flange of structural shape.
  3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
  4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
  5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
  6. C-Clamps (MSS Type 23): For structural shapes.
  7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
    - a. Light (MSS Type 31): 750 lb (340 kg).
    - b. Medium (MSS Type 32): 1500 lb (680 kg).
    - c. Heavy (MSS Type 33): 3000 lb (1360 kg).
  8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
  9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
- J. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
  2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
  3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- K. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches (32 mm).
  2. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.
  3. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from base support.

- L. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.
- M. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.
- N. Use powder-actuated fasteners or mechanical-expansion anchor instead of building attachments where required in concrete construction.

### 3.2 HANGER AND SUPPORT INSTALLATION

- A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.
  - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
  - 2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.
- C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.
- D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- E. Fastener System Installation:
  - 1. Install powder-actuated fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
  - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- F. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- G. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- I. Install lateral bracing with pipe hangers and supports to prevent swaying.
- J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers,

and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

- K. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 (for building services piping) are not exceeded.
- M. Insulated Piping: Comply with the following:
  - 1. Attach clamps and spacers to piping.
    - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
    - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
    - c. Do not exceed pipe stress limits according to ASME B31.9 for building services piping.
  - 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
  - 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
  - 4. Shield Dimensions for Pipe: Not less than the following:
    - a. NPS 1/4 to NPS 3-1/2 (DN 8 to DN 90): 12 inches (305 mm) long and 0.048 inch (1.22 mm) thick.
    - b. NPS 4 (DN 100): 12 inches (305 mm) long and 0.06 inch (1.52 mm) thick.
    - c. NPS 5 and NPS 6 (DN 125 and DN 150): 18 inches (457 mm) long and 0.06 inch (1.52 mm) thick.
  - 5. Insert Material: Length at least as long as protective shield.
  - 6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

### 3.3 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make smooth bearing surface.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

### 3.4 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

### 3.5 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

### 3.6 PAINTING

- A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 220529

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SECTION 220548

VIBRATION AND NOISE CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Provide vibration isolation, soundproofing and noise control for equipment and piping including:

- 1. Pumps.
- 2. Domestic hot and cold water piping.
- 3. Sanitary waste and vent
- 4. Drainage

- B. Acoustic performance of equipment systems and air distribution devices:

- 1. It is the intent of this specification that noise levels from plumbing equipment and piping will not exceed the Noise Criteria Curves (NC) described in Paragraph 3 of this Section. Noise Criteria Curves establish a one number rating for evaluating the acceptability of a sound pressure spectrum according to the average person's hearing. Noise Criteria Curves and their related sound pressure equivalents for each frequency as described in the 1987 ASHRAE Handbook Systems Volume.
- 2. These NC levels should be used as a guide in the event of product substitutions and shop drawing modifications. The NC levels shall also serve as a gauge by which the results of workmanship and care of installation will be judged from an acoustical standpoint, since a poor installation can lead to the generation of noise.
- 3. Noise Criteria for occupied spaces for this project shall be set as follows:

Location	Noise Criteria
Public Spaces	NC35-40
Administrative Offices	NC30-35
Mechanical Room	NC 65

1.3 QUALITY ASSURANCE

- A. Design Criteria:

- 1. Provide noise control to avoid excessive noise in the building due to the operation of machinery or equipment, or due to interconnected piping, ductwork or conduit.

- B. Acoustical Testing/Quality Assurance:

- 1. The contractor shall cooperate with regard to sound tests (ARI 575, ANSI S1.13) which may be conducted by the Owner or his representative to verify that noise criteria are met.
- 2. The contractor shall notify the Architect of any changes which will affect the acoustical performance.

#### 1.4 WORKMANSHIP

- A. Workmanship is critical in achieving the objective of noise control and it is critical that all noise control work must be installed in good workmanship like manner.

### PART 2 - PRODUCTS

#### 2.1 GROMMETS

- A. Grommets shall be 60 durometer, shore A, SBR. RubberMill, Western Rubber or approved equal.

#### 2.2 VIBRATION ISOLATORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Amber/Booth Company, Inc.
  2. Kinetics Noise Control.
  3. Mason Industries.
  4. Vibration Eliminator Co., Inc.
  5. Vibration Mountings & Controls, Inc.
- B. Pads <MWP>: Arranged in multiple layers of sufficient stiffness for uniform loading over pad area, molded with a non-slip pattern sandwiching stainless steel -shim plates, and factory cut to sizes that match requirements of supported equipment. Minimum 5/16 inch thick pads, 12.5% strain, bridge bearing quality with durometer (Shore A scale) of 50.
1. Resilient Material: Oil- and water-resistant neoprene.
  2. If the isolator is bolted to the structure, a neoprene vibration isolation washer and sleeve (Uniroyal Type 620/660, or as approved) shall be installed under the bolt head between the steel washer and the base plate.
- C. Neoprene Mounts <ND>: Neoprene mountings shall have a minimum static deflection of 0.35"(9mm). All metal surfaces shall be neoprene covered and have friction pads both top and bottom. Bolt holes shall be provided on the bottom and a tapped hole and cap screw on top. Steel rails shall be used above the mountings under equipment such as small vent sets to compensate for the overhang. Basis of design mountings shall be type ND or rails type DNR as manufactured by Mason Industries, Inc., or equal by manufacturers identified above.
- D. Split Seals<SS> Split seals shall consist of pipe halves with minimum 3/4"(20mm) thick neoprene sponge cemented to the inner faces. The seal shall be tightened around the pipe to eliminate clearance between the inner sponge face and the piping. Concrete may be packed around the seal to make it integral with the floor, wall or ceiling if the seal is not in place prior to the construction of the building member. Seals shall project a minimum of 1"(25mm) past either face of the wall. Where temperatures exceed 240°F (115°C), 10 lb. density fiberglass may be used in lieu of the sponge. Basis of design seals shall be Type SWS as manufactured by Mason Industries, Inc or equal by manufacturers identified above.
- E. Restrained Spring Isolators <RSI>: Freestanding, steel, open-spring isolators with seismic restraint.
1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to weight being removed; factory-drilled baseplate bonded to 1/4-inch- (6-mm-) thick, neoprene or rubber isolator pad attached to baseplate underside; and

- adjustable equipment mounting and leveling bolt that acts as blocking during installation.
2. Restraint: Seismic stops as required for equipment and authorities having jurisdiction.
  3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
  4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
  5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
  6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
- F. Elastomeric Hangers <NH>: Double-deflection type, fitted with molded, oil-resistant elastomeric isolator elements bonded to steel housings with threaded connections for hanger rods. Color-code or otherwise identify to indicate capacity range.
1. The diameter of the clear hole in the hanger box shall be at least 3/4 inch larger than the diameter of the hanger rod and permit the hanger rod to swing through a 30 degree arc. When installed, the hanger box shall be allowed to rotate through a full 360 degrees without encountering any obstructions. Neoprene shall be bridge-bearing quality with a maximum durometer (Shore A scale) of 50.
  2. Neoprene shall be bridge-bearing quality with a maximum durometer (Shore A scale) of 50.
  3. Unless otherwise specified, the static deflection of DDNH hangers shall be 0.25 inches with a strain not exceeding 12.5%.
- G. Spring Hangers <SPNH>: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression.
1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
  2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
  3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
  4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
  5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
  6. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
  7. Self-centering hanger rod cap to ensure concentricity between hanger rod and support spring coil.
- H. Pipe Riser Resilient Support <RRA>: All-directional, acoustical pipe anchor consisting of 2 steel tubes separated by a minimum of 1/2-inch- (13-mm-) thick neoprene. Include steel and neoprene vertical-limit stops arranged to prevent vertical travel in both directions. Design support for a maximum load on the isolation material of 500 psig (3.45 MPa) and for equal resistance in all directions.
- I. Resilient Pipe Guides <RRG>: Telescopic arrangement of 2 steel tubes or post and sleeve arrangement separated by a minimum of 1/2-inch- (13-mm-) thick neoprene. Where clearances are not readily visible, a factory-set guide height with a shear pin to allow vertical motion due to pipe expansion and contraction shall be fitted. Shear pin shall be removable and re-insertable to allow for selection of pipe movement. Guides shall be capable of motion to meet location requirements.
- J. Flexible Stainless Steel Hoses <FSS>



1. Flexible stainless steel hose shall have stainless steel braid and carbon steel fittings. Sizes 3"(75mm) and larger shall be flanged. Smaller sizes may have male nipples. Minimum lengths shall be as tabulated:
2. Flanged
  - a. (3", 4") x12"
  - b. 6"x12"
3. Male Nipples
  - a. (1/2, 3/4, 1", 1-1/4", 1-1/2" and 2") x12"
  - b. 2-1/2"x18"
4. At equipment, hoses shall be installed on the equipment side of the shut-off valves horizontal and parallel to the equipment shafts wherever possible. Basis of design hoses shall be type FFL or type MN as manufactured by Mason Industries, Inc. or equal by manufacturers identified above.
5. At acoustic joint with three resilient hangers on quiet side of joint.

### 2.3 PIPE LAGGING

- A. Acoustical performance shall be established by ASTM E413 and E90 procedures. Insertion loss, Transmission loss and STC data shall be supplied that meets or exceeds requirements established later in this Specification.
- B. Where indicated on the drawings, pipe shall be wrapped with a minimum 2" thick glass or mineral fiber blanket with a minimum 3.0 lb/ft<sup>3</sup> density, and a mass loaded vinyl sheet covered with an aluminum foil jacket. Complete system shall provide a minimum STC-23 as measured in an independent accredited acoustical laboratory in accordance with ASTM E90 and E413. Insertion Loss data indicating an IL Insertion Loss value of 25 at 500 Hz. shall also be submitted.
- C. Manufactures:
  1. Kinetics Noise Control, Inc.
  2. Childers Products Company
  3. Acoustical Duct & Pipe Lag from Sound Seal, a division of United Process, Inc.
  4. The Proudfoot Company, Inc.

## PART 3 - EXECUTION

### 3.1 GENERAL:

- A. No plumbing piping, fixture, ceiling suspension wires or other elements of the building construction shall be attached to or abutted against the duct, piping and conduit systems.
- B. Where ducts or piping penetrate walls, ceilings and floors of the occupied spaces, or ceiling void partitions or acoustically rated elements whether shown on the drawings or not, acoustically seal the penetration.
- C. Contain rough-in of piping within stud wall cavities no less than 1/4-inch from the plane of the studs and 1 inch from gypsum board or other wall sheathing.

### 3.2 SOUND PROOFING OF CONSTRUCTION

- A. Required for penetrations of ductwork, pipes, and conduits through walls, floors and ceilings of mechanical rooms, electrical rooms with transformers, and Sound-Critical Spaces as called out in Acoustical Performance Section 1.2 of this Specification, as well as those walls, floors, and ceilings indicated on the drawings.

- B. The Contractor shall ensure that the sound control performance of structures be maintained in accordance with the drawings and specifications. All penetrations shall be installed in a manner that results in complete air tightness through structure. If a condition occurs where penetration of the structure by a duct, pipe, conduit, etc., is not shown clearly on the drawings (or described in the specifications), the Contractor shall ask immediately for clarification of the method necessary to install the particular item.
- C. Penetrations of Single-Wythe Masonry and Concrete Constructions
1. Pipe diameter = 1" or larger:
    - a. Install a metal sleeve at the penetration. Size the sleeve to allow for 1/2" Armaflex lining and normal pipe clearances. Line the sleeve with 1/2" thick Armaflex II Sheet Insulation (or equal).
    - b. Install pipe/conduit through lined sleeve and seal airtight with acoustical sealant or fire-rated acoustical sealant (3M Corporation CP 25 or equal) if partition is fire-rated.
    - c. Do not rigidly secure pipe/conduit to wall with angles.
  2. Pipe diameter < 1":
    - a. Wrap pipe/conduit with 1/2" thick Armstrong Self-Seal Armaflex 2000 Pipe Insulation (or equal). Extend wrapping a minimum of 2" beyond the width of the partition on either side.
    - b. Grout tightly to the Armaflex cover on the pipe/conduit.
    - c. Trim Armaflex to the width of the partition, and seal airtight with acoustical sealant or fire-rated acoustical sealant (3M Corporation CP 25 or equal) if partition is fire-rated.
  3. Use of spilt seals in lieu of Armaflex wrap is acceptable upon Commissioner's approval.
  4. Provide flexible connection on noisy side of if crossing acoustic joint.
- D. Penetrations of Single Stud Drywall Constructions
1. Conduit diameter = 1" or larger:
    - a. Wrap with 1/2" thick Armstrong Self-Seal Armaflex 2000 Pipe Insulation (or equal). Extend wrapping a minimum of 2" beyond the width of the partition on either side.
    - b. Install a metal pipe sleeve around the Armaflex wrap.
    - c. Install the drywall around the sleeve and spackle tightly to full thickness of partition.
    - d. Trim Armaflex and sleeve to the width of the partition, and seal airtight with acoustical sealant or fire-rated acoustical sealant (3M Corporation CP 25 or equal) if partition is fire-rated.
  2. Conduit diameter < 1":
    - a. Wrap with 1/2" thick Armstrong Self-Seal Armaflex 2000 Pipe Insulation (or equal). Extend wrapping a minimum of 2" beyond the width of the partition on either side.
    - b. Install the drywall tight to the Armaflex wrap.
    - c. Trim Armaflex to the width of the partition, and seal airtight with acoustical sealant or fire-rated acoustical sealant (3M Corporation CP 25 or equal) if partition is fire-rated.
  3. Multiple Pipe Penetrations
    - a. Where a series of duct, conduits or pipes are penetrating the wall/floor/ceiling, each duct/conduit/pipe shall be separated by minimum 4" in all directions.
    - b. Multiple duct/pipe/conduit penetrations at one location (i.e., one large opening for a series of pipe runs) is not recommended.
  4. Penetrations of Double-Wythe Masonry/Concrete and/or Double Stud Drywall and/or Combination Constructions

- a. Use same techniques described above EXCEPT do not bridge the two studs or wythes with solid members such as sleeves or stud frames. Each sleeve or frame must be completely separate for each individual wythe or stud.
5. Use of spilt seals in lieu of Armaflex wrap is acceptable upon Commissioner's approval.
6. Provide flexible connection on noisy side of if crossing acoustic joint.

### 3.3 SERVICES PENETRATIONS

- A. Pipe: Where pipe penetrates acoustical partitions, provide acoustic seal around the piping.

### 3.4 ELECTRICAL CONNECTIONS:

- A. All isolated equipment to be connected with long lengths of flexible steel conduit from junction box, type depending on environment.

### 3.5 VIBRATION-CONTROL INSTALLATION

- A. General
  1. Level vibration isolated equipment under rated design operating conditions while maintaining the isolation criteria. Isolators shall be plumb and aligned to preclude misalignment or undesired contact during operation
- B. Equipment Restraints:
  1. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch (3.2 mm).
- C. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- D. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- E. Drilled-in Anchors:
  1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid pre-stressed tendons, electrical and telecommunications conduit, and gas lines.
  2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
  3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
  4. Set anchors to manufacturer's recommended torque, using a torque wrench.
  5. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

### 3.6 FIELD QUALITY CONTROL

- A. Perform inspections.

B. Inspections:

1. After the entire installation is complete, and under full operational load, the isolators shall be adjusted so that the load is transferred from the block to the isolators. Ensure all debris from beneath the equipment the equipment and verify there are no short circuits of the isolation. The equipment shall be free in all directions.
2. Measure isolator restraint clearance.
3. Measure isolator deflection.

3.7 ADJUSTING

- A. Adjust isolators after piping system is at operating weight.
- B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.
- C. Adjust active height of spring isolators.
- D. Adjust restraints to permit free movement of equipment within normal mode of operation.

3.8 PLUMBING VIBRATION-CONTROL DEVICE SCHEDULE

A. Supported or Suspended Equipment:

Item / Equipment	Location & Mounting	Isolation Type	Min. Deflection
Electric Water Heaters	Roof MER , mounted on concrete base	ND	0.35 inch
Inline Pumps	Ceiling Hung	SPNH	1 inch
Base mounted pumps		RSI	1 inch
Piping (except fire protection)	All piping up to 3/4 inch in MER Room # plus 5 hangers downstream of MER room.	NH	0.5 inch
	All piping equal to or greater than inch in MER Room # plus 5 hangers downstream of MER room.	SPNH	1 inch
	Across acoustic joint	FSS	
Pipe Risers	Domestic Hot & Cold and Sanitary Waste piping	RRA, RRG	

END OF SECTION 220548

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## SECTION 220553

## IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.

## 1.2 SUBMITTAL

- A. Product Data: For each type of product indicated.

## PART 2 - PRODUCTS

## 2.1 EQUIPMENT LABELS

## A. Metal Labels for Equipment:

1. Material and Thickness: Aluminum, 0.032-inch (0.8-mm) or anodized aluminum, 0.032-inch (0.8-mm) minimum thickness, and having predrilled or stamped holes for attachment hardware.
2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).
3. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
4. Fasteners: Stainless-steel rivets.
5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

## B. Plastic Labels for Equipment:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch (3.2 mm) thick, and having predrilled holes for attachment hardware.
2. Letter Color: Red.
3. Background Color: White.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F (71 deg C).

5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).
  6. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
  7. Fasteners: Stainless-steel rivets.
  8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.
- D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch (A4) bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

## 2.2 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch (3.2 mm) thick, and having predrilled holes for attachment hardware.
- B. Letter Color: Red.
- C. Background Color: White.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F (71 deg C).
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).
- F. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel rivets.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Label Content: Include caution and warning information, plus emergency notification instructions.

## 2.3 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

- B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
  - 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
  - 2. Lettering Size: At least 1-1/2 inches (38 mm) high.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

#### 3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

#### 3.3 PIPE LABEL INSTALLATION

- A. Piping Color-Coding: Painting of piping is specified in Division 09 Section Painting and Finishing.
- B. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
  - 1. Near each valve and control device.
  - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
  - 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
  - 4. At access doors, manholes, and similar access points that permit view of concealed piping.
  - 5. Near major equipment items and other points of origination and termination.
  - 6. Spaced at maximum intervals of 50 feet (15 m) along each run. Reduce intervals to 25 feet (7.6 m) in areas of congested piping and equipment.
  - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.



- C. Pipe Label Color Schedule:
  - 1. Domestic Water Piping:
    - a. Background Color: White.
    - b. Letter Color: Blue.
  - 2. Sanitary Waste and Storm Drainage Piping:
    - a. Background Color: White.
    - b. Letter Color: Black.

END OF SECTION 220553

SECTION 220700  
PLUMBING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Insulation Materials:
  - a. Cellular glass.
  - b. Mineral fiber.
2. Insulating cements.
3. Adhesives.
4. Mastics.
5. Sealants.
6. Factory-applied jackets.
7. Field-applied fabric-reinforcing mesh.
8. Field-applied jackets.
9. Tapes.
10. Securements.
11. Corner angles.

B. Related Sections include the following:

1. Division 23 Section "HVAC Insulation."

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail attachment and covering of heat tracing inside insulation.
3. Detail insulation application at pipe expansion joints for each type of insulation.
4. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
5. Detail removable insulation at piping specialties, equipment connections, and access panels.
6. Detail application of field-applied jackets.
7. Detail application at linkages of control devices.
8. Detail field application for each equipment type.

C. Field quality-control reports.

### 1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.
1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
  2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

## PART 2 - PRODUCTS

### 2.1 INSULATION MATERIALS

- A. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Mineral-Fiber, Pipe and Tank Insulation: Mineral or glass fibers bonded with a thermosetting resin. Semirigid board material with factory-applied ASJ complying with ASTM C 1393, Type II or Type IIIA Category 2, or with properties similar to ASTM C 612, Type IB. Nominal density is 2.5 lb/cu. ft. (40 kg/cu. m) or more. Thermal conductivity (k-value) at 100 deg F (55 deg C) is 0.29 Btu x in./h x sq. ft. x deg F (0.042 W/m x K) or less. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
1. Products:
    - a. CertainTeed Corp.; CrimpWrap.
    - b. Johns Manville; MicroFlex.
    - c. Knauf Insulation; Pipe and Tank Insulation.
    - d. Manson Insulation Inc.; AK Flex.
    - e. Owens Corning; Fiberglas Pipe and Tank Insulation.

## 2.2 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
- B. Cellular-Glass Polystyrene Adhesive: Solvent-based resin adhesive, with a service temperature range of minus 75 to plus 300 deg F (minus 59 to plus 149 deg C).
1. Products:
    - a. Childers Products, Division of ITW; CP-96.
    - b. Foster Products Corporation, H. B. Fuller Company; 81-33.
- C. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.
1. Products:
    - a. Aeroflex USA Inc.; Aero seal.
    - b. Armacell LCC; 520 Adhesive.
    - c. Foster Products Corporation, H. B. Fuller Company; 85-75.
    - d. RBX Corporation; Rubatex Contact Adhesive.
- D. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
1. Products:
    - a. Childers Products, Division of ITW; CP-82.
    - b. Foster Products Corporation, H. B. Fuller Company; 85-20.
    - c. ITW TACC, Division of Illinois Tool Works; S-90/80.
    - d. Marathon Industries, Inc.; 225.
    - e. Mon-Eco Industries, Inc.; 22-25.
- E. Polystyrene Adhesive: Solvent- or water-based, synthetic resin adhesive with a service temperature range of minus 20 to plus 140 deg F (29 to plus 60 deg C).
1. Products:
    - a. Childers Products, Division of ITW; CP-96.
    - b. Foster Products Corporation, H. B. Fuller Company; 97-13.
- F. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
1. Products:
    - a. Childers Products, Division of ITW; CP-82.
    - b. Foster Products Corporation, H. B. Fuller Company; 85-20.
    - c. ITW TACC, Division of Illinois Tool Works; S-90/80.
    - d. Marathon Industries, Inc.; 225.
    - e. Mon-Eco Industries, Inc.; 22-25.
- G. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Products:
  - a. Dow Chemical Company (The); 739, Dow Silicone.
  - b. Johns-Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.
  - c. P.I.C. Plastics, Inc.; Welding Adhesive.
  - d. Red Devil, Inc.; Celulon Ultra Clear.
  - e. Speedline Corporation; Speedline Vinyl Adhesive.

### 2.3 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.
- B. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.

1. Products:
  - a. Childers Products, Division of ITW; CP-35.
  - b. Foster Products Corporation, H. B. Fuller Company; 30-90.
  - c. ITW TACC, Division of Illinois Tool Works; CB-50.
  - d. Marathon Industries, Inc.; 590.
  - e. Mon-Eco Industries, Inc.; 55-40.
  - f. Vimasco Corporation; 749.
2. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm (0.009 metric perm) at 43-mil (1.09-mm) dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F (Minus 29 to plus 82 deg C).
4. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight.
5. Color: White.

- C. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.

1. Products:
  - a. Childers Products, Division of ITW; CP-10.
  - b. Foster Products Corporation, H. B. Fuller Company; 35-00.
  - c. ITW TACC, Division of Illinois Tool Works; CB-05/15.
  - d. Marathon Industries, Inc.; 550.
  - e. Mon-Eco Industries, Inc.; 55-50.
  - f. Vimasco Corporation; WC-1/WC-5.
2. Water-Vapor Permeance: ASTM F 1249, 3 perms (2 metric perms) at 0.0625-inch (1.6-mm) dry film thickness.
3. Service Temperature Range: Minus 20 to plus 200 deg F (Minus 29 to plus 93 deg C).
4. Solids Content: 63 percent by volume and 73 percent by weight.
5. Color: White.

## 2.4 SEALANTS

### A. Joint Sealants:

#### 1. Joint Sealants for Cellular-Glass Products:

- a. Childers Products, Division of ITW; CP-76.
- b. Foster Products Corporation, H. B. Fuller Company; 30-45.
- c. Marathon Industries, Inc.; 405.
- d. Mon-Eco Industries, Inc.; 44-05.
- e. Pittsburgh Corning Corporation; Pittseal 444.
- f. Vimasco Corporation; 750.

#### 2. Joint Sealants for Polystyrene Products:

- a. Childers Products, Division of ITW; CP-70.
- b. Foster Products Corporation, H. B. Fuller Company; 30-45/30-46.
- c. Marathon Industries, Inc.; 405.
- d. Mon-Eco Industries, Inc.; 44-05.
- e. Vimasco Corporation; 750.

3. Materials shall be compatible with insulation materials, jackets, and substrates.
4. Permanently flexible, elastomeric sealant.
5. Service Temperature Range: Minus 100 to plus 300 deg F (Minus 73 to plus 149 deg C).
6. Color: White or gray.

### B. FSK and Metal Jacket Flashing Sealants:

#### 1. Products:

- a. Childers Products, Division of ITW; CP-76-8.
- b. Foster Products Corporation, H. B. Fuller Company; 95-44.
- c. Marathon Industries, Inc.; 405.
- d. Mon-Eco Industries, Inc.; 44-05.
- e. Vimasco Corporation; 750.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F (Minus 40 to plus 121 deg C).
5. Color: Aluminum.

### C. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

#### 1. Products:

- a. Childers Products, Division of ITW; CP-76.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F (Minus 40 to plus 121 deg C).
5. Color: White.

## 2.5 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
  2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
  3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.
  4. PVDC Jacket for Indoor Applications: 4-mil- (0.10-mm-) thick, white PVDC biaxially oriented barrier film with a permeance at 0.02 perms (0.013 metric perms) when tested according to ASTM E 96 and with a flame-spread index of 5 and a smoke-developed index of 20 when tested according to ASTM E 84.
    - a. Products:
      - 1) Dow Chemical Company (The); Saran 540 Vapor Retarder Film and Saran 560 Vapor Retarder Film.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

### 3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment and piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment and pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.

- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
  - 1. Install insulation continuously through hangers and around anchor attachments.
  - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
  - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
  - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:
  - 1. Draw jacket tight and smooth.
  - 2. Cover circumferential joints with 3-inch- (75-mm-) wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches (100 mm) o.c.
  - 3. Overlap jacket longitudinal seams at least 1-1/2 inches (38 mm). Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches (50 mm) o.c.
    - a. For below ambient services, apply vapor-barrier mastic over staples.
  - 4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
  - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.



- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches (100 mm) beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- P. For above ambient services, do not install insulation to the following:
  - 1. Vibration-control devices.
  - 2. Testing agency labels and stamps.
  - 3. Nameplates and data plates.
  - 4. Cleanouts

### 3.3 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
  - 1. Seal penetrations with flashing sealant.
  - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
  - 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches (50 mm) below top of roof flashing.
  - 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
  - 1. Seal penetrations with flashing sealant.
  - 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
  - 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches (50 mm).
  - 4. Seal jacket to wall flashing with flashing sealant.
- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
  - 1. Comply with requirements in Division 07 Section "Penetration Firestopping" and fire-resistive joint sealers.
- F. Insulation Installation at Floor Penetrations:
  - 1. Pipe: Install insulation continuously through floor penetrations.

2. Seal penetrations through fire-rated assemblies. Comply with requirements in Division 07 Section "Penetration Firestopping."

### 3.4 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
  1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
  2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
  3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
  4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
  5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below ambient services, provide a design that maintains vapor barrier.
  6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
  7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic for above ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
  8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
  9. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on

insulated pipes, vessels, and equipment. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

- D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
  2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
  3. Construct removable valve insulation covers in same manner as for flanges except divide the two-part section on the vertical center line of valve body.
  4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches (50 mm) over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
  5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

### 3.5 MINERAL-FIBER INSULATION INSTALLATION

#### A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above ambient surfaces, secure laps with outward clinched staples at 6 inches (150 mm) o.c.
4. For insulation with factory-applied jackets on below ambient surfaces, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

#### B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch (25 mm), and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.6 FINISHES

A. Equipment and Pipe Insulation with ASJ or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Division 09 painting Sections.

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
  - a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Commissioner. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Inspect field-insulated equipment, randomly selected by Commissioner, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location for each type of equipment. For large equipment, remove only a portion adequate to determine compliance.
2. Inspect pipe, fittings, strainers, and valves, randomly selected by Commissioner, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two

locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

- C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

### 3.8 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
  - 1. Drainage piping located in crawl spaces.
  - 2. Underground piping.
  - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

### 3.9 INDOOR PIPING INSULATION SCHEDULE

- A. Domestic Hot and Recirculated Hot Water: Insulation shall be:
  - 1. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch (25 mm) thick with field applied jacket.
- B. Domestic Cold Water : Insulation shall be:
  - 1. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch (25 mm) thick with jacket.
- C. All Horizontal and Vertical Storm water piping and Horizontal sanitary pipe shown on plumbing drawings:
  - 1. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch (25 mm) thick with jacket.

END OF SECTION 220700

SECTION 22 0800  
COMMISSIONING OF PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.
- B. The OPR and BOD documentation are included by reference for information only.
- C. Division 01 section 'LEED Requirements' for additional LEED requirements.

1.2 SUMMARY

- A. This section includes commissioning process requirements for Plumbing systems, assemblies, and equipment.
- B. Related Sections:
  - 1. Division 01 Section "General Commissioning Requirements" for general commissioning process requirements.

1.3 DESCRIPTION

- A. Refer to Division 01 Section "General Commissioning Requirements" for the description of commissioning.

1.4 DEFINITIONS

- A. Refer to Division 01 Section "General Commissioning Requirements" for definitions.

1.5 SUBMITTALS

- A. Refer to Division 01 Section "General Commissioning Requirements" for CxA's role.
- B. Refer to Division 01 Section "Submittals" for specific requirements. In addition, provide the following:
- C. Certificates of readiness
- D. Certificates of completion of installation, prestart, and startup activities.
- E. O&M manuals

## F. Test reports

## 1.6 QUALITY ASSURANCE

- A. Test Equipment Calibration Requirements: Contractors 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. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to coordination during the commissioning 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 plumbing contractor of Division 22 shall ultimately be responsible for all standard testing equipment for the plumbing system in Division 22, except for equipment specific to and used by TAB in their commissioning responsibilities. A sufficient quantity of two-way radios shall be provided by each subcontractor.
- B. Special equipment, tools and instruments (specific to a piece of equipment and only available from vendor) required for testing shall be included in the base bid price to the Commissioner and left on site, except for stand-alone data logging equipment that may be used by the CxA.
- C. 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 Commissioner upon completion of the commissioning process.
- D. Data logging equipment and software required to test equipment will be provided by the CxA, but shall not become the property of the Commissioner.
- E. 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 an accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

## PART 3 - EXECUTION

## 3.1 GENERAL DOCUMENTATION REQUIREMENTS

- A. With assistance from the installing contractors, the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems
- B. **Red-lined Drawings:** 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:** 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 Instruction:** Contractor will provide demonstration and instruction as required by the specifications. A complete instruction plan and schedule must be submitted by the contractor to the CxA four weeks (4) prior to any instruction. A instruction agenda for each instruction session must be submitted to the CxA one (1) week prior the instruction session

## 3.2 CONTRACTOR'S RESPONSIBILITIES

- A. Perform commissioning tests at the direction of the CxA.
- B. Attend construction phase controls coordination meetings.
- C. Attend domestic water balancing review and coordination meetings.
- D. Participate 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, instruction sessions, pipe and duct system testing, flushing and cleaning, equipment start-up, testing and balancing and task completion for Commissioner. Distribute preliminary schedule to commissioning team members.
- G. Update schedule as required throughout the construction period.
- H. Assist the CxA in all verification and functional performance tests.
- I. 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.



- 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 balancing work. Attend the initial balancing meeting for review of the balancing procedures.
- M. Participate in, and schedule vendors and contractors to participate in the instruction sessions.
- 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. Plumbing equipment including domestic water heaters, pumps, and all other equipment furnished under this Division.
  - 2. Gas piping, sanitary waste and vent piping, storm drainage piping, sump pumps and automatic sprinkler system.
  - 3. Fire stopping in fire rated construction, including caulking, gasketing and sealing of smoke barriers.
- 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. Balance Contractor
  - 1. Attend initial commissioning coordination meeting scheduled by the CxA.
  - 2. Submit the site specific balancing plan to the CxA and Commissioner for review and acceptance.
  - 3. Attend the balancing review meeting scheduled by the CxA. Be prepared to discuss the procedures that shall be followed in balancing the Plumbing system.
  - 4. At the completion of the balancing work, and the submittal of the final balancing report, notify the Plumbing contractor and the Commissioner.
  - 5. At the completion of balancing work, and the submittal of the final balancing report, notify the Plumbing Contractor and the Commissioner.
  - 6. Participate in verification of the balancing report, which will consist of repeating measurements contained in the balancing reports. Assist in diagnostic purposes when directed.
- R. Equipment Suppliers
  - 1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Commissioner, to keep warranties in force.
  - 2. Assist in equipment testing per agreements with contractors.
  - 3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.
- S. Refer to Division 01 Section "General Commissioning Requirements" for additional contractor responsibilities.

### 3.3 COMMISSIONER'S RESPONSIBILITIES

- A. Refer to Division 01 Section "General Commissioning Requirements" for Commissioner's Responsibilities.

### 3.4 CxA'S RESPONSIBILITIES

- A. Refer to Division 01 Section "General Commissioning Requirements" for CxA's 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 balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.
- D. Set 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 DOMESTIC WATER BALANCING VERIFICATION

- A. Prior to performance of Domestic Water 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 balancing Work.
- C. Provide technicians, instrumentation, and tools to verify testing and balancing of Plumbing systems at the direction of the CxA.
  - 1. The CxA will notify testing and balancing subcontractor ten (10) days in advance of the date of field verification. Notice will not include data points to be verified.
  - 2. The 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 a deviation of more than 10 percent. Failure of more than 10 percent of selected items shall result in rejection of final balancing report.
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. 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 Plumbing contractor, balancing 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 "Instrumentation and Control for HVAC" and "Sequence of Operations for HVAC Controls." Assist the CxA with preparation of testing plans.

- C. **Pipe system cleaning, flushing, hydrostatic tests, and chemical treatment:** Test requirements are specified in Division 22 piping Sections. Plumbing Contractor shall prepare a pipe system cleaning, flushing, and hydrostatic testing plan. Provide cleaning, flushing, testing, and treating plan and final reports to the CxA. Plan shall include the following:
1. Sequence of testing and testing procedures for each section of pipe to be tested, identified by pipe zone or sector identification marker. Markers shall be keyed to Drawings for each pipe sector, showing the physical location of each designated pipe test section. Drawings keyed to pipe zones or sectors shall be formatted to allow each section of piping to be physically located and identified when referred to in pipe system cleaning, flushing, hydrostatic testing, and chemical treatment plan.
  2. Description of equipment for flushing operations.
  3. Minimum flushing water velocity.
  4. Tracking checklist for managing and ensuring that all pipe sections have been cleaned, flushed, hydrostatically tested, and chemically treated.
- D. **Plumbing Distribution System Testing:** Provide technicians, instrumentation, tools, and equipment to test performance of air, fuel gas, sanitary waste and vent piping, storm drainage piping, sprinkler and domestic water distribution systems.
- 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. Domestic Hot Water System
  2. Gas- Fired Domestic Water Heater
  3. Gas System – Natural Gas
  4. Hot Water Circulating Pump
  5. Sprinkler System
- 3.9 DEFICIENCIES/NON-CONFORMANCE, COST OF RETESTING, FAILURE DUE TO MANUFACTURER DEFECT
- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to deficiencies/non-conformance, cost of retesting, or failure due to manufacturer defect.
- 3.10 APPROVAL
- A. Refer to Division 01 Section "General Commissioning Requirements" for approval procedures.
- 3.11 DEFERRED TESTING
- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to deferred testing.

3.12 OPERATION AND MAINTENANCE MANUALS

- A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in Division 01.
- B. Refer to Division 01 Section "General Commissioning Requirements" for the AE and CxA roles in the Operation and Maintenance Manual contribution, review and approval process.

3.13 INSTRUCTION OF CITY OF NEW YORK PERSONNEL

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to instruction.

END OF SECTION 22 0800

SECTION 221116  
DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes domestic water piping inside the building.
- B. Water meters will be furnished and installed by utility company.
- C. See Division 22 Section "Domestic Water Piping Specialties" for water distribution piping specialties.

1.2 SUBMITTALS

- A. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Comply with NSF 14, "Plastics Piping System Components and Related Materials," for plastic, potable domestic water piping and components.
- B. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9," for potable domestic water piping and components.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Refer to Part 3 "Pipe and Fitting Applications" Article for applications of pipe, tube, fitting, and joining materials.
- B. Transition Couplings for Aboveground Pressure Piping: Coupling or other manufactured fitting the same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
- C. Hard Copper Tube: ASTM B 88, Types L (ASTM B 88M, Types B and C), water tube, drawn temper.
  - 1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
  - 2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends. Furnish Class 300 flanges if required to match piping.

3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

## 2.2 VALVES

- A. Bronze and cast-iron, general-duty valves are specified in Division 22 Section "General-Duty Valves for Plumbing Piping."
- B. Balancing and drain valves are specified in Division 22 Section "Domestic Water Piping Specialties."

## PART 3 - EXECUTION

### 3.1 EXCAVATION

- A. Excavating, trenching, and backfilling are specified in Section 31 20 00 Earthwork.

### 3.2 PIPE AND FITTING APPLICATIONS

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.
- B. Flanges may be used on aboveground piping, unless otherwise indicated.
- C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.
- D. Under-Building-Slab, Water-Service Piping on Service Side of Water Meter: Refer to Section 22 05 00 Common Work Results for Plumbing.
- E. Domestic Water Piping on Service Side of Water Meter inside the Building: Use any of the following piping materials for each size range:
  1. NPS 2 -Hard copper tube, Type L ; copper pressure fittings; and soldered joints.
- F. Under-Building-Slab, Domestic Water Piping on House Side of Water Meter, NPS 4 (DN 100) and Smaller: Hard copper tube, Type K; copper pressure fittings; and soldered joints.
- G. Aboveground Domestic Water Piping: Use the following piping materials for each size range:
  1. NPS 1 (DN 25) and Smaller: Hard copper tube, Type L, copper pressure fittings; and soldered joints.
  2. NPS 1-1/4 and NPS 1-1/2 (DN 32 and DN 40): Hard copper tube, Type L, copper pressure fittings; and soldered joints.
  3. NPS 2 (DN 50): Hard copper tube, Type L; copper pressure fittings; and soldered joints.

### 3.3 VALVE APPLICATIONS

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
1. Shutoff Duty: Use bronze ball or gate valves for piping NPS 2 (DN 50) and smaller. Use cast-iron butterfly or gate valves with flanged ends for piping NPS 2-1/2 (DN 65) and larger.
  2. Throttling Duty: Use bronze ball or globe valves for piping NPS 2 (DN 50) and smaller. Use cast-iron butterfly valves with flanged ends for piping NPS 2-1/2 (DN 65) and larger.
  3. Hot-Water-Piping, Balancing Duty: Memory-stop balancing valves.
  4. Drain Duty: Hose-end drain valves.
- B. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 2 (DN 50) and smaller. Use butterfly or gate valves for piping NPS 2-1/2 (DN 65) and larger.
- C. Install drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping.
1. Install hose-end drain valves at low points in water mains, risers, and branches.
  2. Install stop-and-waste drain valves where indicated.
- D. Install balancing valve in each hot-water circulation return branch and discharge side of each pump and circulator. Set balancing valves partly open to restrict but not stop flow. Use ball valves for piping NPS 2 (DN 50) and smaller and butterfly valves for piping NPS 2-1/2 (DN 65) and larger. Balancing valves are specified in Division 22 Section "Domestic Water Piping Specialties."
- E. Install calibrated balancing valves in each hot-water circulation return branch and discharge side of each pump and circulator. Set calibrated balancing valves partly open to restrict but not stop flow. Calibrated balancing valves are specified in Division 22 Section "Domestic Water Piping Specialties."

### 3.4 PIPING INSTALLATION

- A. Basic piping installation requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. Install under-building-slab copper tubing according to CDA's "Copper Tube Handbook."
- C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section "Common Work Results for Plumbing."
- D. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside the building at each domestic water service entrance. Pressure gages are specified in Division 22 Section "Meters and Gages for Plumbing Piping," and drain



valves and strainers are specified in Division 22 Section "Domestic Water Piping Specialties."

- E. Install domestic water piping level with 0.25 percent slope downward toward drain and plumb.
- F. Rough-in domestic water piping for water-meter installation according to utility company's requirements.

### 3.5 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.
- C. Extruded-Tee Connections: Form tee in copper tube according to ASTM F 2014. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.

### 3.6 ROUGHING-IN FOR WATER METERS

- A. Rough-in domestic water piping for water meter installation according to utility company's requirements.
- B. Water meters will be furnished and installed by utility.

### 3.7 HANGER AND SUPPORT INSTALLATION

- A. Pipe hanger and support devices are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:
  - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
  - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
    - a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.
    - b. Longer Than 100 Feet (30 m): MSS Type 43, adjustable roller hangers.
    - c. Longer Than 100 Feet (30 m): MSS Type 49, spring cushion rolls, if indicated.
  - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet (30 m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
  - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
- C. Support vertical piping and tubing at base and at each floor.

- D. Rod diameter may be reduced 1 size for double-rod hangers, to a minimum of 3/8 inch (10 mm).
- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 3/4 (DN 20) and Smaller: 60 inches (1500 mm) with 3/8-inch (10-mm) rod.
  - 2. NPS 1 and NPS 1-1/4 (DN 25 and DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm) rod.
  - 3. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10-mm) rod.
- F. Install supports for vertical copper tubing every 10 feet (3 m).
- G. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

### 3.8 CONNECTIONS

- A. Install piping adjacent to equipment and machines to allow service and maintenance.
- B. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- C. Connect domestic water piping to water-service piping with shutoff valve, and extend and connect to the following:
  - 1. Water Heaters: Cold-water supply and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
  - 2. Plumbing Fixtures: Cold- and hot-water supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 22 Section "Plumbing Fixtures."
  - 3. Equipment: Cold- and hot-water supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 (DN 65) and larger.

### 3.9 FIELD QUALITY CONTROL

- A. Inspect domestic water piping as follows:
  - 1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by Commissioner.
  - 2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of Commissioner:
    - a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
    - b. Final Inspection: Arrange final inspection for Commissioner to observe tests specified below and to ensure compliance with requirements.
  - 3. Reinspection: If Commissioner finds that piping will not pass test or inspection, make required corrections and arrange for reinspection.

4. Reports: Prepare inspection reports and have them signed by Commissioner.
- B. Test domestic water piping as follows:
1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
  2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
  3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
  4. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
  5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
  6. Prepare reports for tests and required corrective action.

### 3.10 CLEANING

- A. Clean and disinfect potable domestic water piping using purging and disinfecting procedures prescribed by authorities having jurisdiction.
- B. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.
- C. Prepare and submit reports of purging and disinfecting activities.

END OF SECTION 221116

SECTION 221119

DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following domestic water piping specialties:

1. Drain valves.
2. Vacuum Breakers
3. Balancing Valves.
4. Backflow Preventer.
5. Hose bibb.
6. Wall Hydrant.
7. Water hammer arresters.
8. Trap-seal primer valves.

1.2 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig (860 kPa), unless otherwise indicated.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.
- C. Operation and maintenance data.

1.4 QUALITY ASSURANCE

- A. NSF Compliance:
  1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.
  2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

PART 2 - PRODUCTS

2.1 VACUUM BREAKERS

A. Pipe-Applied, Atmospheric-Type Vacuum Breakers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Ames Co.
    - b. Cash Acme.
    - c. Conbraco Industries, Inc.
    - d. FEBCO; SPX Valves & Controls.
    - e. Rain Bird Corporation.
    - f. Toro Company (The); Irrigation Div.
    - g. Watts Industries, Inc.; Water Products Div.
    - h. Zurn Plumbing Products Group; Wilkins Div.
  2. Standard: ASSE 1001.
  3. Size: NPS 1/4 to NPS 3 (DN 8 to DN 80), as required to match connected piping.
  4. Body: Bronze.
  5. Inlet and Outlet Connections: Threaded.
  6. Finish: Chrome plated.
- B. Hose-Connection Vacuum Breakers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Arrowhead Brass Products, Inc.
    - b. Cash Acme.
    - c. Conbraco Industries, Inc.
    - d. Legend Valve.
    - e. MIFAB, Inc.
    - f. Prier Products, Inc.
    - g. Watts Industries, Inc.; Water Products Div.
    - h. Woodford Manufacturing Company.
    - i. Zurn Plumbing Products Group; Light Commercial Operation.
    - j. Zurn Plumbing Products Group; Wilkins Div.
  2. Standard: ASSE 1001.
  3. Body: Bronze, nonremovable, with manual drain.
  4. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.
  5. Finish: Chrome or nickel plated.

## 2.2 BACKFLOW PREVENTERS

- A. Reduced-Pressure-Principle Backflow Preventers:
1. Basis-of-Design Product: Subject to compliance with requirements, provide backflow preventer by Wilkins Model 975 -MS as indicated on DEP approved application for backflow preventers. Device shall be installed as per NYC DEP Cross-Connection requirements and in compliance with approved application. Device shall be provided with air gap fitting and integral Relief monitoring switch. All deviations from the approved application shall be brought to the attention of Architect or Engineer prior to the installation.
  2. Standard: ASSE 1013.
  3. Operation: Continuous-pressure applications.
  4. Pressure Loss: 13 psig (83 kPa) maximum, through middle 1/3 of flow range.
  5. Size: 2" and 3/4".
  6. Body: Bronze.
  7. End Connections: Threaded.

8. Configuration: Designed for horizontal, straight through flow.
9. Accessories:
  - a. Valves: Ball valves.
  - b. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection, Model MG.
  - c. Integral Relief Valve Monitoring Switch with dry contact to transmit signal to remote location.

B. Backflow-Preventer Test Kits:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Wilkins.
2. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

## 2.3 BALANCING VALVES

A. Memory-Stop Balancing Valves:

1. Balancing valve shall be "B-Plus" manufactured by Presco or equal from one of the following manufacturers:
  - a. Conbraco Industries, Inc.
  - b. Crane Co.; Crane Valve Group; Crane Valves.
  - c. Crane Co.; Crane Valve Group; Jenkins Valves.
  - d. Crane Co.; Crane Valve Group; Stockham Div.
  - e. Hammond Valve.
  - f. Milwaukee Valve Company.
  - g. NIBCO INC.
  - h. Red-White Valve Corp.
2. Standard: MSS SP-110 for two-piece, copper-alloy ball valves.
3. Pressure Rating: 400-psig (2760-kPa) minimum CWP.
4. Size: NPS 3/4 (DN 20) or smaller.
5. Body: Brass or Copper alloy.
6. Port: Standard or full port.
7. Ball: Chrome-plated brass.
8. Seats and Seals: Replaceable.
9. End Connections: Solder joint or threaded.
10. Handle: Vinyl-covered steel with memory-setting device.

## 2.4 HOSE BIBBS

A. Hose Bibb HB-1: Woodford Model 24 or approved equal:

1. Standard: ASSE 1011.
2. Body Material: Bronze.
3. Seat: Bronze, replaceable.
4. Supply Connections: NPS 1/2 or NPS 3/4 (DN 15 or DN 20) threaded or solder-joint inlet.
5. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
6. Pressure Rating: 125 psig (860 kPa).

7. Vacuum Breaker: Integral, nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
8. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.
9. Finish for Service Areas: Rough bronze.
10. Finish for Finished Rooms: Chrome or nickel plated.
11. Operation for Equipment Rooms: Wheel handle or operating key.
12. Operation for Service Areas: Wheel handle.
13. Operation for Finished Rooms: Operating key.
14. Include operating key with each operating-key hose bibb.
15. Include wall flange with each chrome- or nickel-plated hose bibb.

## 2.5 WALL HYDRANTS

### A. Non-freeze Wall Hydrants:

1. Non-freeze wall hydrants shall be: Bronze nickel plated quarter quarter turn non-freeze hydrant with hose connection, integral vacuum breaker, "T" handle key, adjustable wall clamp and stainless steel box, J.R. Smith Model 5509QT-WC or approved equal.
2. Approved Manufacturer:
  - a. Josam Company.
  - b. MIFAB, Inc.
  - c. Watts Drainage Products Inc.
  - d. Zurn Plumbing Products Group; Light Commercial Operation.
  - e. Zurn Plumbing Products Group; Specification Drainage Operation.
3. Standard: ASME A112.21.3M for concealed-outlet, self-draining wall hydrants.
4. Pressure Rating: 125 psig (860 kPa).
5. Operation: Loose key.
6. Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.
7. Inlet: NPS 3/4 or NPS 1 (DN 20 or DN 25).
8. Outlet: Concealed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
9. Box: Deep, flush mounting with cover.
10. Box and Cover Finish: Nickel bronze.
11. Nozzle and Wall-Plate Finish: Nickel bronze.
12. Operating Keys(s): Two with each wall hydrant.
13. Vacuum breaker: Integrated

## 2.6 DRAIN VALVES

### A. Ball-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
2. Pressure Rating: 400-psig (2760-kPa) minimum CWP.
3. Size: NPS 3/4 (DN 20).
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
6. Seats and Seals: Replaceable.
7. Handle: Vinyl-covered steel.
8. Inlet: Threaded or solder joint.

9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

## 2.7 WATER HAMMER ARRESTERS

### A. Water Hammer Arresters:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. AMTROL, Inc.
  - b. Josam Company.
  - c. MIFAB, Inc.
  - d. PPP Inc.
  - e. Sioux Chief Manufacturing Company, Inc.
  - f. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - g. Tyler Pipe; Wade Div.
  - h. Watts Drainage Products Inc.
  - i. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Copper tube with piston.
4. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

## 2.8 TRAP PRIMER

- A. Mini-primer electronic trap primer, PPP Model MP-500-115V or approved equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Refer to Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.
- B. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.
  1. Locate backflow preventers in same room as connected equipment or system.
  2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are not acceptable for this application.
  3. Do not install bypass piping around backflow preventers.
- C. Install water regulators with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.
- D. Install balancing valves in locations where they can easily be adjusted.



- E. Install temperature-actuated water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
  - 1. Install thermometers and water regulators if specified.
  - 2. Install cabinet-type units recessed in or surface mounted on wall as specified.
- F. Install Y-pattern strainers for water on supply side of main control valve at connection to base building riser.
- G. Install water hammer arresters in water piping according to PDI-WH 201.
- H. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
- I. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping and specialties.
- J. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
  - 1. Intermediate atmospheric-vent backflow preventers.
  - 2. Reduced-pressure-principle backflow preventers.
  - 3. Double-check backflow-prevention assemblies.
  - 4. Water pressure-reducing valves.
  - 5. Primary, thermostatic, water mixing valves.
  - 6. Supply-type, trap-seal primer valves.
- K. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

### 3.2 FIELD QUALITY CONTROL

- A. Perform the following tests and prepare test reports:
  - 1. Test each reduced-pressure-principle backflow preventer according to authorities having jurisdiction and the device's reference standard.
- B. Remove and replace malfunctioning domestic water piping specialties and retest as specified above.

### 3.3 ADJUSTING

- A. Set field-adjustable pressure set points of water pressure-reducing valves.
- B. Set field-adjustable flow of balancing valves.
- C. Set field-adjustable temperature set points of temperature-actuated water mixing valves.

END OF SECTION 221119

## SECTION 221316

## SANITARY WASTE AND VENT PIPING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. This Section includes the following soil and waste, sanitary drainage and vent piping inside the building:
  - 1. Pipe, tube, and fittings.
  - 2. Special pipe fittings.

## 1.2 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
  - 1. Soil, Waste, and Vent Piping: 10-foot head of water.

## 1.3 SUBMITTALS

- A. Field quality-control inspection and test reports.

## 1.4 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; and "NSF-drain" for plastic drain piping.

## PART 2 - PRODUCTS

## 2.1 PIPING MATERIALS

- A. Hub-and-Spigot, Cast-Iron Pipe and Fittings: ASTM A 74, Extra Heavy Class.
  - 1. Gaskets: ASTM C 564, rubber.
- B. Hubless Cast-Iron Pipe and Fittings: ASTM A 888 or CISPI 301.
  - 1. Solvent Stack Fittings: ASME B16.45 or ASSE 1043, hubless, cast-iron aerator and deaerator drainage fittings.

2. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.
  - a. Standard, Shielded, Stainless-Steel Couplings: CISPI 310, with stainless-steel corrugated shield; stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve.
- C. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade A or B, Schedule 40, galvanized. Include ends matching joining method.
  1. Drainage Fittings: ASME B16.12, galvanized, threaded, cast-iron drainage pattern.
  2. Pressure Fittings:
    - a. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106, Schedule 40, galvanized, seamless steel pipe. Include ends matching joining method.
    - b. Malleable-Iron Unions: ASME B16.39; Class 150; hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface; and female threaded ends.
    - c. Gray-Iron, Threaded Fittings: ASME B16.4, Class 125, galvanized, standard pattern.
    - d. Cast-Iron Flanges: ASME B16.1, Class 125.
    - e. Cast-Iron, Flanged Fittings: ASME B16.1, Class 125, galvanized.

### PART 3 - EXECUTION

#### 3.1 PIPING APPLICATIONS

- A. Special pipe fittings with pressure ratings at least equal to piping pressure ratings may be used in applications below, unless otherwise indicated.
- B. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.
- C. Aboveground, soil, waste, and vent piping shall be:
  1. Hubless cast-iron soil pipe and fittings; standard, stainless-steel couplings; and hubless-coupling joints.
- D. Aboveground, sewage ejector discharge piping shall be:
  1. Galvanized Steel pipe, drainage fittings, and threaded joints.
- E. House drain and Underground, soil, waste, and vent piping shall be:
  1. Extra heavy class, hub-and-spigot, cast-iron soil pipe and fittings; gaskets; and compression joints.

## 3.2 PIPING INSTALLATION

- A. Basic piping installation requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.
- C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section "Common Work Results for Plumbing."
- D. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Wall penetration systems are specified in Division 22 Section "Common Work Results for Plumbing."
- E. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
- F. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- G. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- H. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
  - 1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 (DN 80) and smaller; 1 percent downward in direction of flow for piping NPS 4 (DN 100) and larger.
  - 2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
  - 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- I. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.
- J. Do not enclose, cover, or put piping into operation until it is inspected and approved by the Commissioner.

### 3.3 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. Cast-Iron, Soil-Piping Joints: Make joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
  - 1. Gasketed Joints: Make with rubber gasket matching class of pipe and fittings.
  - 2. Hubless Joints: Make with rubber gasket and sleeve or clamp.
- C. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

### 3.4 VALVE INSTALLATION

- A. General-duty valves are specified in Division 22 Section "General-Duty Valves for Plumbing Piping."
- B. Shutoff Valves: Install shutoff valve on each sewage pump discharge.
  - 1. Use gate or full-port ball valve for piping NPS 2 (DN 50) and smaller.
  - 2. Use gate valve for piping NPS 2-1/2 (DN 65) and larger.
- C. Check Valves: Install swing check valve, downstream from shutoff valve, on each sewage pump discharge.
- D. Backwater Valves: Install backwater valves in piping subject to sewage backflow.
  - 1. Horizontal Piping: Horizontal backwater valves. Use normally closed type, unless otherwise indicated.
  - 2. Floor Drains: Drain outlet backwater valves, unless drain has integral backwater valve.
  - 3. Install backwater valves in accessible locations.
  - 4. Backwater valves are specified in Division 22 Section "Sanitary Waste Piping Specialties."

### 3.5 HANGER AND SUPPORT INSTALLATION

- A. Seismic-restraint devices are specified in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- B. Pipe hangers and supports are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:
  - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
  - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
    - a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.
    - b. Longer Than 100 Feet (30 m): MSS Type 43, adjustable roller hangers.

- c. Longer Than 100 Feet (30 m), if Indicated: MSS Type 49, spring cushion rolls.
  - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet (30 m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
  - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.
- F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 60 inches (1500 mm) with 3/8-inch (10-mm) rod.
  - 2. NPS 3 (DN 80): 60 inches (1500 mm) with 1/2-inch (13-mm) rod.
  - 3. NPS 4 and NPS 5 (DN 100 and DN 125): 60 inches (1500 mm) with 5/8-inch (16-mm) rod.
  - 4. Spacing for 10-foot (3-m) lengths may be increased to 10 feet (3 m). Spacing for fittings is limited to 60 inches (1500 mm).
- G. Install supports for vertical cast-iron soil piping every 15 feet (4.5 m).
- H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 1-1/4 (DN 32): 84 inches (2100 mm) with 3/8-inch (10-mm) rod.
  - 2. NPS 1-1/2 (DN 40): 108 inches (2700 mm) with 3/8-inch (10-mm) rod.
  - 3. NPS 2 (DN 50): 10 feet (3 m) with 3/8-inch (10-mm) rod.
  - 4. NPS 2-1/2 (DN 65): 11 feet (3.4 m) with 1/2-inch (13-mm) rod.
  - 5. NPS 3 (DN 80): 12 feet (3.7 m) with 1/2-inch (13-mm) rod.
  - 6. NPS 4 and NPS 5 (DN 100 and DN 125): 12 feet (3.7 m) with 5/8-inch (16-mm) rod.
- I. Install supports for vertical steel piping every 15 feet (4.5 m).
- J. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 1-1/4 (DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm) rod.
  - 2. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10-mm) rod.
  - 3. NPS 2-1/2 (DN 65): 108 inches (2700 mm) with 1/2-inch (13-mm) rod.
  - 4. NPS 3 to NPS 5 (DN 80 to DN 125): 10 feet (3 m) with 1/2-inch (13-mm) rod.
- K. Install supports for vertical copper tubing every 10 feet (3 m).

- L. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

### 3.6 CONNECTIONS

- A. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- B. Connect drainage and vent piping to the following:
  - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 22 Section "Sanitary Waste Piping Specialties."
  - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
  - 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 22 Section "Sanitary Waste Piping Specialties."
  - 4. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 (DN 65) and larger.

### 3.7 FIELD QUALITY CONTROL

- A. During installation, notify Commissioner at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
  - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
  - 2. Final Inspection: Arrange for final inspection by Commissioner to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If Commissioner finds that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by Commissioner.
- D. Test sanitary drainage and vent piping according to procedures of Commissioner.
  - 1. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
  - 2. Prepare reports for tests and required corrective action.

### 3.8 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 221316



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SECTION 221319

SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following sanitary drainage piping specialties:
  1. Cleanouts.
  2. Floor drains.
  3. Miscellaneous sanitary drainage piping specialties.
  4. Flashing materials.
  5. Backwater valves

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and accessories for grease interceptors.

1.3 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 CLEANOUTS

- A. Exposed Cast-Iron Cleanouts:
  1. Manufacturers:
    - a. Josam Company; Josam Div.
    - b. MIFAB, Inc.
    - c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
    - d. Tyler Pipe; Wade Div.
    - e. Watts Drainage Products Inc.
    - f. Zurn Plumbing Products Group; Specification Drainage Operation.
  2. Standard: ASME A112.36.2M.
  3. Size: Same as connected drainage piping
  4. Body Material: Hubless, cast-iron soil pipe test tee as required to match connected piping.
  5. Closure: brass plug.
  6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

## B. Cast-Iron Floor Cleanouts:

1. Manufacturers:
  - a. Josam Company; Josam Div.
  - b. Oatey.
  - c. Sioux Chief Manufacturing Company, Inc.
  - d. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - e. Tyler Pipe; Wade Div.
  - f. Watts Drainage Products Inc.
  - g. Zurn Plumbing Products Group; Light Commercial Operation.
  - h. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M for threaded, adjustable housing cleanout.
3. Size: Same as connected branch.
4. Type: Threaded, adjustable housing.
5. Body or Ferrule: Cast iron.
6. Clamping Device: Not required.
7. Outlet Connection: Inside calk.
8. Closure: Brass plug with tapered threads.
9. Adjustable Housing Material: Cast iron with threads.
10. Frame and Cover Material and Finish: Nickel-bronze.
11. Frame and Cover Shape: Round.
12. Top Loading Classification: Light Duty.
13. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to cleanout.

## C. Cast-Iron Wall Cleanouts:

1. Manufacturers:
  - a. Josam Company; Josam Div.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - d. Tyler Pipe; Wade Div.
  - e. Watts Drainage Products Inc.
  - f. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure: drilled-and-threaded brass plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Wall Access: Round, flat, stainless steel cover plate with screw.

## 2.2 FLOOR DRAINS

- A. Cast-Iron Floor Drains FD in finish areas: Subject to compliance with requirements, provide floor drain Model 2010 -A - P075 manufactured by J.R.Smith or a comparable product by one of the following:

1. Available Manufacturers:

- a. Josam Company; Josam Div.
  - b. Tyler Pipe; Wade Div.
  - c. Watts Drainage Products Inc.
  - d. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.6.3.
  3. Pattern: Floor drain.
  4. Body Material: cast iron.
  5. Seepage Flange: Required.
  6. Anchor Flange: Required.
  7. Clamping Device: Required.
  8. Outlet: Bottom.
  9. Backwater Valve: Not required.
  10. Coating on Interior and Exposed Exterior Surfaces: Not required.
  11. Sediment Bucket: Not required.
  12. Top or Strainer Material: Nickel bronze.
  13. Top of Body and Strainer Finish: Nickel bronze.
  14. Top Shape: Round.
  15. Dimensions of Top or Strainer: 6".
  16. Top Loading Classification: Light Duty.
  17. Funnel: Required where shown on contract drawings.
  18. Inlet Fitting: Not required.
  19. Trap Material: Cast iron.
  20. Trap Pattern: P-trap.
  21. Trap primer connection:  $\frac{3}{4}$ ", Required.
- B. Cast-Iron Floor Drains FD in boiler room: Subject to compliance with requirements, provide floor drain Model 2142- P075-U manufactured by J.R.Smith or a comparable product by one of the following:
1. Available Manufacturers:
    - a. Josam Company; Josam Div.
    - b. Tyler Pipe; Wade Div.
    - c. Watts Drainage Products Inc.
    - d. Zurn Plumbing Products Group; Specification Drainage Operation.
  2. Standard: ASME A112.6.3.
  3. Pattern: Floor drain.
  4. Body Material: cast iron.
  5. Seepage Flange: Required.
  6. Anchor Flange: Required.
  7. Clamping Device: Required.
  8. Outlet: Bottom.
  9. Backwater Valve: Not required.
  10. Coating on Interior and Exposed Exterior Surfaces: Not required.
  11. Sediment Bucket: Required.
  12. Top or Strainer Material: Duco cast iron.
  13. Top of Body and Strainer Finish: Duco cast iron.
  14. Top Shape: Round.
  15. Dimensions of Top or Strainer: 12".
  16. Top Loading Classification: Heavy Duty.
  17. Funnel: Required where shown on contract drawings.
  18. Inlet Fitting: Not required.
  19. Trap Material: Cast iron.
  20. Trap Pattern: P-trap.

21. Trap primer connection:  $\frac{3}{4}$ ", Required.

## 2.3 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

### A. Open Drains (standpipe):

1. Description: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron, soil-pipe fittings. Include P-trap, 18" long hub-and-spigot riser section; and where required, increaser fitting joined with ASTM C 564, rubber gaskets.
2. Size: Same as connected waste piping.

### B. Floor-Drain, Trap-Seal Primer Fittings:

1. Description: Cast iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.
2. Size: Same as floor drain outlet with NPS 1/2 (DN 15) side inlet.

### C. Air-Gap Fittings:

1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
2. Body: Bronze or cast iron.
3. Inlet: Opening in top of body.
4. Outlet: Larger than inlet.
5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

### D. Funnel Drain:

1. Funnel drain shall be duco cast iron with acid resistant coated interior and exterior with no-hub adaptor, 4" outlet, Figure 3821 as manufactured by J.R.Smith or approved equal.

## 2.4 FLASHING MATERIALS

### A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:

1. General Use: 4.0-lb/sq. ft. (20-kg/sq. m), 0.0625-inch (1.6-mm) thickness.
2. Vent Pipe Flashing: 3.0-lb/sq. ft. (15-kg/sq. m), 0.0469-inch (1.2-mm) thickness.
3. Burning: 6-lb/sq. ft. (30-kg/sq. m), 0.0938-inch (2.4-mm) thickness.

### B. Fasteners: Metal compatible with material and substrate being fastened.

### C. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

### D. Solder: ASTM B 32, lead-free alloy.

- E. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Refer to Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.
- B. Install backwater valves in building drain piping. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.
- C. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
1. Size same as drainage piping up to NPS 4 (DN 100). Use NPS 4 (DN 100) for larger drainage piping unless larger cleanout is indicated.
  2. Locate at each change in direction of piping greater than 45 degrees.
  3. Locate at minimum intervals of 50 feet (15 m) for piping NPS 4 (DN 100) and smaller and 100 feet (30 m) for larger piping.
  4. Locate at base of each vertical soil and waste stack.
- D. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- E. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
- F. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
1. Position floor drains for easy access and maintenance.
  2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
    - a. Radius, 30 Inches (750 mm) or Less: Equivalent to 1 percent slope, but not less than 1/4-inch (6.35-mm) total depression.
    - b. Radius, 30 to 60 Inches (750 to 1500 mm): Equivalent to 1 percent slope.
    - c. Radius, 60 Inches (1500 mm) or Larger: Equivalent to 1 percent slope, but not greater than 1-inch (25-mm) total depression.
  3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
  4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- G. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.

- H. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.
- I. Assemble open drain fittings and install with top of hub 2 inches (51 mm) above floor.
- J. Install deep-seal traps on floor drains and other waste outlets, if indicated.
- K. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.
  - 1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
  - 2. Size: Same as floor drain inlet.
- L. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.
- M. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.
- N. Install vent caps on each vent pipe passing through roof.
- O. Install grease interceptors, including trapping, venting, and flow-control fitting, according to authorities having jurisdiction and with clear space for servicing.
  - 1. Above-Floor Installation: Set unit with bottom resting on floor, unless otherwise indicated.
  - 2. Flush with Floor Installation: Set unit and extension, if required, with cover flush with finished floor.
  - 3. Recessed Floor Installation: Set unit in receiver housing having bottom or cradle supports, with receiver housing cover flush with finished floor.
  - 4. Install cleanout immediately downstream from interceptors not having integral cleanout on outlet.
- P. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.
- Q. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

### 3.2 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Grease Interceptors: Connect inlet and outlet to unit, and connect flow-control fitting and vent to unit inlet piping. Install valve on outlet of automatic drawoff-type unit.

### 3.3 FLASHING INSTALLATION

- A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:

1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft. (30-kg/sq. m), 0.0938-inch (2.4-mm) thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft. (20-kg/sq. m), 0.0625-inch (1.6-mm) thickness or thinner.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches (250 mm), and skirt or flange extending at least 8 inches (200 mm) around pipe.
  2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around sleeve.
  3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around specialty.
- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Division 07 Section "Sheet Metal Flashing and Trim."
- F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

### 3.4 LABELING AND IDENTIFYING

- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each grease interceptor.
- B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

### 3.5 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221319



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SECTION 221413  
STORM DRAINAGE PIPING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. This Section includes the following storm drainage piping inside the building.
1. Pipe, tube, and fittings.
  2. Special pipe fittings.

## 1.2 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
1. Storm Drainage Piping: 10-foot head of water.

## 1.3 SUBMITTALS

- A. Field quality-control inspection and test reports.

## 1.4 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

## PART 2 - PRODUCTS

## 2.1 PIPING MATERIALS

- A. Hub-and-Spigot, Cast-Iron Pipe and Fittings: ASTM A 74, Extra heavy class.
1. Gaskets: ASTM C 564, rubber.
- B. Hubless Cast-Iron Pipe and Fittings: ASTM A 888 or CISPI 301.
1. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.
    - a. Heavy-Duty, Shielded, Stainless-Steel Couplings: With stainless-steel shield, stainless-steel bands and tightening devices, and ASTM C 564, rubber sleeve.

- C. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade A or B, Schedule 40, galvanized. Include ends matching joining method.
  - 1. Drainage Fittings: ASME B16.12, galvanized, threaded, cast-iron drainage pattern.

### PART 3 - EXECUTION

#### 3.1 PIPING APPLICATIONS

- A. Special pipe fittings with pressure ratings at least equal to piping pressure ratings may be used in applications below, unless otherwise indicated.
- B. Aboveground storm drainage piping, except otherwise noted, shall be:
  - 1. Hubless cast-iron soil pipe and fittings; heavy-duty shielded, stainless-steel couplings; and coupled joints.
- C. House Drain and Underground storm drainage piping shall be:
  - 1. Extra heavy, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

#### 3.2 PIPING INSTALLATION

- A. Storm sewer and drainage piping outside the building are specified in Division 33 Section "Storm Utility Drainage Piping."
- B. Basic piping installation requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- C. Install cleanouts at grade and extend to where building storm drains connect to building storm sewers. Cleanouts are specified in Division 22 Section "Storm Drainage Piping Specialties."
- D. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section "Common Work Results for Plumbing."
- E. Install wall-penetration-fitting system at each service pipe penetration through foundation wall. Make installation watertight.
- F. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
- G. Make changes in direction for storm piping using appropriate branches, bends, and long-sweep bends. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

- H. Lay buried building drain piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- I. Install storm drainage piping at the following minimum slopes, unless otherwise indicated:
  - 1. Building Storm Drain: 1 percent downward in direction of flow for piping NPS 3 (DN 80) and smaller; 1 percent downward in direction of flow for piping NPS 4 (DN 100) and larger.
  - 2. Horizontal Storm-Drainage Piping: 2 percent downward in direction of flow.
- J. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.
- K. Do not enclose, cover, or put piping into operation until it is inspected and approved by Commissioner.

### 3.3 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. Hub-and-Spigot, Cast-Iron Soil Piping Gasketed Joints: Join according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
- C. Hubless Cast-Iron Soil Piping Coupled Joints: Join according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.

### 3.4 VALVE INSTALLATION

- A. Backwater Valves: Install backwater valves in piping subject to backflow.
  - 1. Horizontal Piping: Horizontal backwater valves. Use normally closed type, unless otherwise indicated.
  - 2. Install backwater valves in accessible locations.
  - 3. Backwater valve are specified in Division 22 Section "Storm Drainage Piping Specialties."

### 3.5 HANGER AND SUPPORT INSTALLATION

- A. Seismic-restraint devices are specified in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- B. Pipe hangers and supports are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:
  - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
  - 2. Individual, Straight, Horizontal Piping Runs: According to the following:

- a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.
  - b. Longer Than 100 Feet (30 m): MSS Type 43, adjustable roller hangers.
  - c. Longer Than 100 Feet (30 m), if Indicated: MSS Type 49, spring cushion rolls.
3. Multiple, Straight, Horizontal Piping Runs 100 Feet (30 m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
  4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.
- F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 60 inches (1500 mm) with 3/8-inch (10-mm) rod.
  2. NPS 3 (DN 80): 60 inches (1500 mm) with 1/2-inch (13-mm) rod.
  3. NPS 4 and NPS 5 (DN 100 and DN 125): 60 inches (1500 mm) with 5/8-inch (16-mm) rod.
  4. NPS 6 (DN 150): 60 inches (1500 mm) with 3/4-inch (19-mm) rod.
  5. Spacing for 10-foot (3-m) lengths may be increased to 10 feet (3 m). Spacing for fittings is limited to 60 inches (1500 mm).
- G. Install supports for vertical cast-iron soil piping every 15 feet (4.5 m).
- H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4 (DN 32): 84 inches (2100 mm) with 3/8-inch (10-mm) rod.
  2. NPS 1-1/2 (DN 40): 108 inches (2700 mm) with 3/8-inch (10-mm) rod.
  3. NPS 2 (DN 50): 10 feet (3 m) with 3/8-inch (10-mm) rod.
  4. NPS 2-1/2 (DN 65): 11 feet (3.4 m) with 1/2-inch (13-mm) rod.
  5. NPS 3 (DN 80): 12 feet (3.7 m) with 1/2-inch (13-mm) rod.
  6. NPS 4 and NPS 5 (DN 100 and DN 125): 12 feet (3.7 m) with 5/8-inch (16-mm) rod.
  7. NPS 6 (DN 150): 12 feet (3.7 m) with 3/4-inch (19-mm) rod.
- I. Install supports for vertical steel piping every 15 feet (4.5 m).
- J. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4 (DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm) rod.
  2. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10-mm) rod.
  3. NPS 2-1/2 (DN 65): 108 inches (2700 mm) with 1/2-inch (13-mm) rod.
  4. NPS 3 to NPS 5 (DN 80 to DN 125): 10 feet (3 m) with 1/2-inch (13-mm) rod.
  5. NPS 6 (DN 150): 10 feet (3 m) with 5/8-inch (16-mm) rod.

- K. Install supports for vertical copper tubing every 10 feet (3 m).
- L. Install hangers for ABS and PVC piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 48 inches (1200 mm) with 3/8-inch (10-mm) rod.
  - 2. NPS 3 (DN 80): 48 inches (1200 mm) with 1/2-inch (13-mm) rod.
  - 3. NPS 4 and NPS 5 (DN 100 and DN 125): 48 inches (1200 mm) with 5/8-inch (16-mm) rod.
  - 4. NPS 6 (DN 150): 48 inches (1200 mm) with 3/4-inch (19-mm) rod.
- M. Install supports for vertical ABS and PVC piping every 48 inches (1200 mm).
- N. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

### 3.6 CONNECTIONS

- A. Connect interior storm drainage piping to exterior storm drainage piping. Use transition fitting to join dissimilar piping materials.
- B. Connect storm drainage piping to roof drains and storm drainage specialties.

### 3.7 FIELD QUALITY CONTROL

- A. During installation, notify Commissioner at least 24 hours before inspection must be made. Perform tests specified below in presence of Commissioner.
  - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in.
  - 2. Final Inspection: Arrange for final inspection by Commissioner to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If Commissioner finds that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by Commissioner.
- D. Test storm drainage piping according to procedures of Commissioner.

### 3.8 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 221413

SECTION 221423

STORM DRAINAGE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following storm drainage piping specialties:
  - 1. Cleanouts.
  - 2. Roof drains.
  - 3. Miscellaneous storm drainage piping specialties.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 CLEANOUTS:

- A. Exposed Cast-Iron Cleanouts:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Josam Company; Josam Div.
    - b. MIFAB, Inc.
    - c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
    - d. Tyler Pipe; Wade Div.
    - e. Watts Drainage Products Inc.
    - f. Zurn Plumbing Products Group; Specification Drainage Operation.
  - 2. Standard: ASME A112.36.2M for cast iron.
  - 3. Size: Same as connected drainage piping
  - 4. Body Material: Hubless, cast-iron soil pipe test tee as required to match connected piping.
  - 5. Closure Plug Size: Same as cleanout size.
- B. Cast-Iron Floor Cleanouts:



1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Josam Company; Josam Div.
  - b. Oatey.
  - c. Sioux Chief Manufacturing Company, Inc.
  - d. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - e. Tyler Pipe; Wade Div.
  - f. Watts Drainage Products Inc.
  - g. Zurn Plumbing Products Group; Light Commercial Operation.
  - h. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M for threaded, adjustable housing] cleanout.
3. Size: Same as connected branch.
4. Type: Threaded, adjustable housing.
5. Body or Ferrule: Cast iron.
6. Clamping Device: Required for membrane floors only.
7. Outlet Connection: Inside calk.
8. Closure: [Brass plug with straight threads and gasket.
9. Adjustable Housing Material: nickel bronze with threads..
10. Frame and Cover Material and Finish: Nickel-bronze.
11. Frame and Cover Shape: Round.
12. Top Loading Classification: Medium Duty.
13. Riser: ASTM A 74, Extra-Heavyclass, cast-iron drainage pipe fitting and riser to cleanout.

C. Cast-Iron Wall Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Josam Company; Josam Div.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - d. Tyler Pipe; Wade Div.
  - e. Watts Drainage Products Inc.
  - f. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: Hubless, cast-iron soil pipe test tee] as required to match connected piping.
5. Closure: Countersunk or raised-head, drilled-and-threaded brass plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Wall Access: Round, flat, stainless-steel] cover plate with screw.

2.2 ROOF DRAINS, AREA DRAINS, PLANTER DRAINS:

A. Roof Drains RD:

1. Basis-of-Design Product: Subject to compliance with requirements, provide roof drains J.R.Smith Model 1020-R-C-U or a comparable product by one of the following:
    - a. Josam Company; Josam Div.
    - b. MIFAB, Inc.
    - c. Tyler Pipe; Wade Div.
    - d. Zurn Plumbing Products Group; Specification Drainage Operation.
  2. Standard: ASME A112.21.2M.
  3. Pattern: Roof drain.
  4. Body Material: Cast iron.
  5. Dimensions of Body: 15-1/4".
  6. Combination Flashing Ring and Gravel Stop.
  7. Flow-Control Weirs: Not required.
  8. Outlet: Side.
  9. Dome Material: Cast iron.
  10. Extension Collars: Required.
  11. Underdeck Clamp: Required.
  12. Sump Receiver: Required.
  13. Vandal Proof Dome: Yes.
- B. Cast-Iron Emergency Roof Drains (ERD):
1. Basis-of-Design Product: Subject to compliance with requirements, provide roof drains J.R.Smith Model 1080C or a comparable product by one of the following:
    - a. Josam Company; Josam Div.
    - b. MIFAB, Inc.
    - c. Tyler Pipe; Wade Div.
    - d. Zurn Plumbing Products Group; Specification Drainage Operation.
  2. Standard: ASME A112.21.2M.
  3. Pattern: Roof drain.
  4. Body Material: Cast iron.
  5. Dimensions of Body: 15-1/4".
  6. Combination Flashing Ring and Gravel Stop.
  7. Flow-Control Weirs: Not required.
  8. Solid Water Dam: 3" Solid Water Dam.
  9. Outlet: Side.
  10. Dome Material: Cast iron.
  11. Extension Collars: Required.
  12. Underdeck Clamp: Required.
  13. Sump Receiver: Required.
- C. Cast-Iron Area Drains (AD):
1. Basis-of-Design Product: Subject to compliance with requirements, provide area drains J.R.Smith Model 1460-HP-U or a comparable product by one of the following:

- a. Josam Company; Josam Div.
  - b. MIFAB, Inc.
  - c. Tyler Pipe; Wade Div.
  - d. Zurn Plumbing Products Group; Light Commercial Operation.
2. Standard: ASME A112.21.2M.
  3. Pattern: Promenade Deck drain.
  4. Body Material: Cast iron.
  5. Top Material: Nickel Bronze Top.
  6. Grade: vandal proof; heel proof.
  7. Dimensions of Body: 12"x12".
  8. Combination Flashing Ring and Gravel Stop.
  9. Outlet: Side.
  10. Underdeck Clamp: Not Required.
  11. Sump Receiver: Not Required.
  12. Sediment Basket: Required.

D. Planter Drains PD:

1. Basis-of-Design Product: Subject to compliance with requirements, provide planter drains J.R.Smith Model 2675-CID or a comparable product by one of the following:
  - a. Josam Company; Josam Div.
  - b. MIFAB, Inc.
  - c. Tyler Pipe; Wade Div.
  - d. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.21.2M.
3. Pattern: Planter drain.
4. Body Material: Cast iron.
5. Dimensions of Body: 12".
6. Combination Flashing Ring and Gravel Stop.
7. Flow-Control Weirs: Not required.
8. Outlet: Bottom.
9. Dome Material: Cast iron.
10. Extension Collars: Not Required.
11. Underdeck Clamp: Not Required.
12. Sump Receiver: Not Required.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Refer to Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.
- B. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:

1. Size same as drainage piping up to NPS 4 (DN 100). Use NPS 4 (DN 100) for larger drainage piping unless larger cleanout is indicated.
  2. Locate at each change in direction of piping greater than 45 degrees.
  3. Locate at minimum intervals of 50 feet (15 m) for piping NPS 4 (DN 100) and smaller and 100 feet (30 m) for larger piping.
  4. Locate at base of each vertical soil and waste stack.
- C. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- D. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
- E. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions. Roof materials are specified in Division 07.
1. Install roof-drain flashing collar or flange so that there will be no leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.
  2. Position roof drains for easy access and maintenance.
- F. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.
- G. Install conductor nozzles at exposed bottom of conductors where they spill onto grade.
- H. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

### 3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

### 3.3 FLASHING INSTALLATION

- A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft. (30-kg/sq. m), 0.0938-inch (2.4-mm) thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft. (20-kg/sq. m), 0.0625-inch (1.6-mm) thickness or thinner.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches (250 mm), and skirt or flange extending at least 8 inches (200 mm) around pipe.
  2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around sleeve.
  3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around specialty.
- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.

3.4 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221423

## SECTION 223300

## ELECTRIC DOMESTIC WATER HEATER ACCESSORIES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Water heater accessories.

## 1.2 SUBMITTALS

- A. Product Data: For each type and size of water heater indicated. Include rated capacities, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings: Diagram power, signal, and control wiring.
- C. Operation and maintenance data.
- D. Warranty.

## 1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. ASME Compliance: Where ASME-code construction is indicated, fabricate and label commercial water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
- C. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9" for all components that will be in contact with potable water.

## 1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of electric water heaters that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including storage tank and supports.
    - b. Faulty operation of controls.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal use.

2. Warranty Period(s): From date of Substantial Completion:
  - a. Commercial Electric Water Accessories: One year.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
  2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

### 2.2 HOT WATER CIRCULATOR

- A. Commercial Hot Water Circulators:
  1. Manufacturers:
    - a. Bell and Gossett.
    - b. Taco
    - c. Approved Equal
  2. Pump shall be LEAD-free, horizontal, oil-lubricated type, rated for 125 psi.
  3. The motor shall be of the drip-proof, sleeve-bearing, quiet operating, rubber-mounted construction. Motors shall have built-in thermal overload protectors.
  4. For pump model and rating refer to schedule on contract drawings.

### 2.3 AQUASTAT AND TIMER

- A. Provide Automatic Timer and Aquastat Combination consisting of automatic timer kit TC-1 by Bell and Gossett and AQ-1/2 aquastat by Bell and Gossett (basis of design) or equal by manufacturers identified above that is compatible with the other components of the system.

### 2.4 EXPANSION TANK

- A. Expansion Tank shall be listed for Portable Water applications with all wetted components to be FDA approved.
- B. Tank shall be bladder type with steel shell designed and constructed per ASME Section VIII, Div.1 and heavy duty butyl bladder
- C. Tank shall be rated for 125 psig, 240 degree F.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Install all equipment in accordance with manufacturer's recommendations and provide required tests.

END OF SECTION 223300



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SECTION 224000  
PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Faucets for lavatories and sinks.
  2. Flushometers.
  3. Toilet seats.
  4. Protective shielding guards.
  5. Fixture supports.
  6. Dishwasher air-gap fittings.
  7. Disposers.
  8. Hot-water dispensers.
  9. Water closets.
  10. Urinals.
  11. Lavatories.
  12. Pantry sinks.

1.2 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.
- C. FRP: Fiberglass-reinforced plastic.
- D. PMMA: Polymethyl methacrylate (acrylic) plastic.
- E. PVC: Polyvinyl chloride plastic.
- F. Solid Surface: Nonporous, homogeneous, cast-polymer-plastic material with heat-, impact-, scratch-, and stain-resistance qualities.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Diagram power, signal, and control wiring.
- C. Operation and maintenance data.

## 1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for plumbing fixtures for people with disabilities.
- C. Regulatory Requirements: Comply with requirements of New York City Plumbing code section 604 for maximum flow rates and consumption for water fixtures and WaterSense program labeling requirements..
- D. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- E. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.
- F. Comply with the following applicable standards and other requirements specified for plumbing fixtures:
  - 1. Enameled, Cast-Iron Fixtures: ASME A112.19.1M.
  - 2. Plastic Laundry Trays: ANSI Z124.6.
  - 3. Plastic Shower Enclosures: ANSI Z124.2.
  - 4. Plastic Sinks: ANSI Z124.6.
  - 5. Porcelain-Enameled, Formed-Steel Fixtures: ASME A112.19.4M.
  - 6. Slip-Resistant Bathing Surfaces: ASTM F 462.
  - 7. Solid-Surface-Material Lavatories and Sinks: ANSI/ICPA SS-1.
  - 8. Stainless-Steel Residential Sinks: ASME A112.19.3.
  - 9. Vitreous-China Fixtures: ASME A112.19.2M.
  - 10. Water-Closet, Flush Valve, Tank Trim: ASME A112.19.5.
  - 11. Water-Closet, Flushometer Tank Trim: ASSE 1037.
- G. Comply with the following applicable standards and other requirements specified for lavatory and sink faucets:
  - 1. Backflow Protection Devices for Faucets with Side Spray: ASME A112.18.3M.
  - 2. Backflow Protection Devices for Faucets with Hose-Thread Outlet: ASME A112.18.3M.
  - 3. Diverter Valves for Faucets with Hose Spray: ASSE 1025.
  - 4. Faucets: ASME A112.18.1.
  - 5. Hose-Connection Vacuum Breakers: ASSE 1011.
  - 6. Hose-Coupling Threads: ASME B1.20.7.
  - 7. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
  - 8. NSF Potable-Water Materials: NSF 61.
  - 9. Pipe Threads: ASME B1.20.1.
  - 10. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
  - 11. Supply Fittings: ASME A112.18.1.
  - 12. Brass Waste Fittings: ASME A112.18.2.

- H. Comply with the following applicable standards and other requirements specified for miscellaneous fittings:
1. Atmospheric Vacuum Breakers: ASSE 1001.
  2. Brass and Copper Supplies: ASME A112.18.1.
  3. Dishwasher Air-Gap Fittings: ASSE 1021.
  4. Manual-Operation Flushometers: ASSE 1037.
  5. Plastic Tubular Fittings: ASTM F 409.
  6. Brass Waste Fittings: ASME A112.18.2.
  7. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.
- I. Comply with the following applicable standards and other requirements specified for miscellaneous components:
1. Disposers: ASSE 1008 and UL 430.
  2. Dishwasher Air-Gap Fittings: ASSE 1021.
  3. Flexible Water Connectors: ASME A112.18.6.
  4. Grab Bars: ASTM F 446.
  5. Hose-Coupling Threads: ASME B1.20.7.
  6. Hot-Water Dispensers: ASSE 1023 and UL 499.
  7. Off-Floor Fixture Supports: ASME A112.6.1M.
  8. Pipe Threads: ASME B1.20.1.
  9. Plastic Toilet Seats: ANSI Z124.5.
  10. Supply and Drain Protective Shielding Guards: ICC A117.1.

## PART 2 - PRODUCTS

### 2.1 LAVATORY FAUCETS

#### A. Lavatory Faucets, L:

1. Basis-of-Design Product: Subject to compliance with requirements, provide lavatory faucet American Standard Monterrey Model 7500.174.002 or a comparable product by one of the following:
  - a. Kohler Co.
  - b. Zurn Plumbing Products Group; Commercial Brass Operation.
2. Description: Two-handle mixing valve. Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.
  - a. Body Material: Commercial, solid brass.
  - b. Finish: Polished chrome plate.
  - c. Maximum Flow Rate: 0.35 gpm.
  - d. Centers: 4 inches (203 mm).
  - e. Mounting: Deck, exposed.
  - f. Valve Handle(s): Wrist blade, 4 inches (102 mm).
  - g. Inlet(s): NPS 1/2 (DN 15).
  - h. Spout: Field-convertible rigid/swivel gooseneck type.

- i. Spout Outlet: Non-aerated Spray, 0.35 gpm.
- j. Operation: manual.
- k. Drain: Grid.
- l. Tempering Device: Not required.

## 2.2 SINK FAUCETS

### A. Sink Faucets, PS:

1. Basis-of-Design Product: Subject to compliance with requirements, provide kitchen sink American Standard Monterrey Model 6409.170 or a comparable product by one of the following:
  - a. Eljer.
  - b. Kohler Co.
2. Description: Kitchen faucet with spray, three-hole fixture. Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.
  - a. Body Material: Commercial, solid brass.
  - b. Finish: Polished chrome plate.
  - c. Maximum Flow Rate: 1.5 gpm.
  - d. Mixing Valve: Two-lever handle.
  - e. Backflow Protection Device for Hose Outlet: Not required.
  - f. Backflow Protection Device for Side Spray: Not required.
  - g. Centers: 8 inches (203 mm).
  - h. Mounting: Deck, exposed.
  - i. Handle(s): Wrist blade, 4 inches (102 mm).
  - j. Inlet(s): NPS 1/2 (DN 15).
  - k. Spout Type: Field-convertible gooseneck rigid/swivel gooseneck spout.
  - l. Spout Outlet: Aerator.
  - m. Vacuum Breaker: Not required.
  - n. Operation: Compression, manual.
  - o. Drain: Grid..

## 2.3 FLUSHOMETERS

### A. Flushometers, WC:

1. Basis-of-Design Product: Subject to compliance with requirements, provide flushometer American Standard "FloWise" Model 6047.121.002 or a comparable product by one of the following:
  - a. Sloan Valve Company.
  - b. Zurn Plumbing Products Group; Commercial Brass Operation.
2. Description: Flushometer for water-closet-type fixture. Include brass body with corrosion-resistant internal components, control stop with check valve, vacuum

breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.

- a. Internal Design: piston operation.
- b. Style: Exposed, chrome plated.
- c. Inlet Size: NPS 1 (DN 25).
- d. Trip Mechanism: Oscillating, lever-handle actuator.
- e. Consumption: 1.28 gal./flush.
- f. Tailpiece Size: NPS 1-1/2 (DN 40).

B. Flushometers, UR:

1. Basis-of-Design Product: Subject to compliance with requirements, provide flushometer American Standard "FloWise" Model 6045.013.002 or a comparable product by one of the following:
  - a. Sloan Valve Company.
  - b. Zurn Plumbing Products Group; Commercial Brass Operation.
2. Description: Flushometer for urinal fixture. Include brass body with corrosion-resistant internal components, control stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.
  - a. Internal Design: piston operation.
  - b. Style: Exposed, chrome plated.
  - c. Inlet Size: NPS 3/4 (DN 20).
  - d. Trip Mechanism: Oscillating, lever-handle actuator.
  - e. Consumption: 0.125 gal./flush.
  - f. Tailpiece Size: NPS 1 (DN 25).

2.4 TOILET SEATS

A. Toilet Seats, WC:

1. Basis-of-Design Product: Subject to compliance with requirements, provide toilet seat American Standard Model No. 5905.100.
  - a. Bemis Manufacturing Company.
  - b. Church Seats.
2. Description: Toilet seat for water-closet-type fixture.
  - a. Material: Molded, solid plastic with antimicrobial agent.
  - b. Configuration: Open front, without cover.
  - c. Size: Elongated.
  - d. Hinge Type: SS, self-sustaining.
  - e. Class: Heavy-duty commercial.
  - f. Color: White.

## 2.5 PROTECTIVE SHIELDING GUARDS

### A. Protective Shielding Pipe Covers:

1. Basis-of-Design Product: Subject to compliance with requirements, provide waste and supply piping protective covers, ADA compliant, consisting of one P-trap cover and two angle valves and supplies covers, Lav Guard Model 3102 E-Z by Truebro or equal by one of the following manufacturers:
  - a. Insul-Tect Products Co.; a Subsidiary of MVG Molded Products.
  - b. McGuire Manufacturing Co., Inc.
  - c. Zurn Plumbing Products Group.

## 2.6 FIXTURE SUPPORTS

### A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Josam Company.
2. MIFAB Manufacturing Inc.
3. Smith, Jay R. Mfg. Co.
4. Tyler Pipe; Wade Div.
5. Watts Drainage Products Inc.; a div. of Watts Industries, Inc.
6. Zurn Plumbing Products Group; Specification Drainage Operation.

### B. Water-Closet Supports, WC and WC-H:

1. Description: Combination carrier designed for accessible and standard mounting height of wall-mounting, water-closet-type fixture. Include single or double, vertical or horizontal, hub-and-spigot or hubless waste fitting as required for piping arrangement; faceplates; couplings with gaskets; feet; and fixture bolts and hardware matching fixture. Include additional extension coupling, faceplate, and feet for installation in wide pipe space. Support shall be J.R.Smith Model 0544 or Model 0542.

### C. Urinal Supports, UR:

1. Description: Type I, urinal carrier with fixture support plates, bearing plates and coupling with seal and fixture bolts and hardware matching fixture, similar to J.R.Smith Model 0635 or 0637 for wall-mounting, urinal-type fixture. Include steel uprights with feet.
2. Accessible-Fixture Support: Include rectangular steel uprights.

### D. Lavatory Supports, L:

1. Description: Type II, lavatory carrier with concealed arms, tie rod and floor mounted uprights, similar to J.R.Smith Model 0700 for wall-mounting, lavatory-type fixture. Include steel uprights with feet.
2. Accessible-Fixture Support: Include rectangular steel uprights.

## 2.7 WATER CLOSETS

### A. Water Closets, WC and WC-H:

1. Basis-of-Design Product: Subject to compliance with requirements, provide water closet by American Standard Afwall "FloWise" Model 3351.128 or a comparable product by one of the following:
  - a. Kohler Co.
  - b. TOTO USA, Inc.
2. Description: Accessible, wall-mounting, vitreous-china fixture designed for flushometer valve operation.
3. Style: Flushometer valve.
  - a. Bowl Type: Elongated with siphon-jet design. Include bolt caps matching fixture.
  - b. Height: Standard and Accessible where indicated on architectural drawings.
  - c. Design Consumption: 1.28 gal./flush.
  - d. Color: White.
  - e. Spud: 1-1/2" top inlet spud.
4. Toilet Seat: WC.

## 2.8 URINALS

### A. Urinals, UR:

1. Basis-of-Design Product: Subject to compliance with requirements, provide urinal American Standard "FlowWise" Model 6590.001 or a comparable product by one of the following:
  - a. Kohler Co.
  - b. TOTO USA, Inc.
2. Description: Accessible, wall-mounting, back-outlet, vitreous-china fixture designed for flushometer valve operation.
  - a. Type: Washout flush action.
  - b. Strainer or Trapway: Integral cast strainer with integral trap.
  - c. Design Consumption: 0.125 gal./flush.
  - d. Color: White.
  - e. Supply Spud Size: NPS 3/4 (DN 20).
  - f. Outlet Size: NPS 2 (DN 50).
  - g. Flushometer: UR.
  - h. Fixture Support: Urinal UR chair carrier.



## 2.9 LAVATORIES

### A. Lavatories, L:

1. Basis-of-Design Product: Subject to compliance with requirements, provide American Standard Comrade Model 0124.131 or a comparable product by one of the following:
  - a. Kohler Co.
  - b. TOTO USA, Inc.
2. Description: Accessible, wall-mounting, vitreous-china fixture.
  - a. Type: With back.
  - b. Size: 20 by 18 inches (508 by 457 mm) rectangular.
  - c. Faucet Hole Punching: Three holes, 2-inch (51-mm) centers.
  - d. Faucet Hole Location: Top.
  - e. Pedestal: Not required.
  - f. Color: White.
  - g. Faucet: Lavatory L.
  - h. Supplies: NPS 3/8 (DN 10) chrome-plated copper with stops.
  - i. Drain: Grid.
    - 1) Location: Near back of bowl.
  - j. Drain Piping: NPS 1-1/4 by NPS 1-1/2 (DN 32 by DN 40) chrome-plated, cast-brass P-trap; tubular brass waste to wall and wall escutcheon.
  - k. Fixture Support: Lavatory L.

## 2.10 PANTRY SINKS

### A. Pantry Sinks, PS:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Elkay undermount single bowl sink Model ELUHAD1616 or a comparable product by one of the following:
  - a. Kohler Co.
  - b. Eljer.
2. Description: One-bowl, undermount, stainless-steel kitchen sink.
  - a. Overall Dimensions: 18-1/2"x 18-1/2"
  - b. Metal Thickness: #18 gauge.
  - c. Bowl:
    - 1) Dimensions: 16"x16".
    - 2) Drain: 3-1/2-inch crumb cup.
  - a) Location: Near back of bowl.

- d. Sink Faucet: PS.
- e. Supplies: NPS 1/2 (DN 15) chrome-plated copper with stops.
- f. Drain Piping: NPS 2 (DN 40) chrome-plated, cast-brass P-trap; tubular brass waste to wall; and wall escutcheon(s).
- g. Disposer: Not required.
- h. Dishwasher Air-Gap Fitting: Not required.
- i. Hot-Water Dispenser: Not required.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions.
- B. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.
  - 1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
  - 2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
  - 3. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.
- C. Install back-outlet, wall-mounting fixtures onto waste fitting seals and attach to supports.
- D. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.
- E. Install wall-mounting fixtures with tubular waste piping attached to supports.
- F. Install fixtures level and plumb according to roughing-in drawings.
- G. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
- H. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.
- I. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.
- J. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.
- K. Install tanks for accessible, tank-type water closets with lever handle mounted on wide side of compartment.
- L. Install toilet seats on water closets.

- M. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- N. Install water-supply flow-control fittings with specified flow rates in fixture supplies at stop valves.
- O. Install faucet flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- P. Install shower flow-control fittings with specified maximum flow rates in shower arms.
- Q. Install traps on fixture outlets.
  - 1. Exception: Omit trap on fixtures with integral traps.
  - 2. Exception: Omit trap on indirect wastes, unless otherwise indicated.
- R. Install disposer in outlet of each sink indicated to have disposer. Install switch where indicated or in wall adjacent to sink if location is not indicated.
- S. Install dishwasher air-gap fitting at each sink indicated to have air-gap fitting. Install in sink deck. Connect inlet hose to dishwasher and outlet hose to disposer.
- T. Install hot-water dispensers in back top surface of sink or in countertop with spout over sink.
- U. Install escutcheons at piping wall and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings. Escutcheons are specified in Division 22 Section "Common Work Results for Plumbing."
- V. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Sealants are specified in Division 07 Section "Joint Sealants."

### 3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- D. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

- A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.
- B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.
- C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.
- D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.
- E. Install fresh batteries in sensor-operated mechanisms.

3.4 PROTECTION

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 224000

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## SECTION 230001

## SUMMARY OF HVAC WORK

## PART 1 GENERAL

## 1.1 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification and Location: East Elmhurst Community Library Expansion, 95-08 Astoria Blvd., Queens, NY.
- B. The project will comply with the latest Building Code of the City of New York, Energy Conservation Construction Code of City of New York, ASME, NFPA, ASHRAE, NYC Local Laws, and all other applicable governmental Codes.
- C. The scope of work consists of, but not limited to the following:
  - 1. Provide one gas fired, electric DX cooling, variable volume, roof mounted packaged rooftop AC unit incorporating digital scroll compressor, enthalpy economizer and demand control ventilation.
  - 2. Provide all electric heating as indicated on drawings and specified hereinafter.
  - 3. Provide roof curbs. Coordinate roof curb for rooftop AC unit and all roof mounted fans as noted on plans.
  - 4. Provide all new diffusers, grilles and registers as shown on drawings and as specified hereinafter.
  - 5. Provide all new volume and fire dampers, transfer ducts & air inlets and outlets as noted on plans and as specified hereinafter.
  - 6. Provide all new ducting, all new access doors, all new control wiring and conduits, all insulation, all new duct lining, all new hangers and supports and all other accessories required for the proper installation and performance of the new equipment
  - 7. Provide standalone programmable control for rooftop AC units, electric heating, fans and all related equipment as shown on drawings and hereinafter. Provide all required sensors and controllers as shown on drawings as specified and required for a fully functional system.
  - 8. In addition to labor and material guarantee specified herein, the contractor shall provide one-year of service & maintenance starting from the date of completion and testing of the new air conditioning system, heating system units and fans. The schedule of service and maintenance shall be as per unit of manufacturer's recommendations.
  - 9. Testing, balancing, and adjusting of the new heating & cooling system as specified hereinafter.
  - 10. All cores and other openings in exterior walls, interior partitions, slabs, roofing, etc., for ducts, piping, sleeves, conduits, and other penetrations shall be provided, with their locations coordinated among the individual trades.

11. Provide all sleeves, conduit, escutcheons, etc. in the wall/floor/roof penetrations. Provide the fire stopping and/or insulation at all penetrations around the ducts, and conduit, etc.
12. Provide all hoisting and rigging of equipment and material required to complete work of this section
13. Provide all vibration and noise control to include vibration isolation, sound attenuators, soundproofing of installation as specified hereinafter, etc.
14. Provide testing to establish ambient noise levels and submit test report to in accordance with requirements of NYC 2008 Mechanical Code, Section MC 926 to the Commissioner prior to review and approval of new equipment.
15. Provide testing to establish ambient noise levels and submit test report to in accordance with requirements of NYC 2008 Mechanical Code, Section MC 926 to the Commissioner upon installation and testing adjusting and balancing of new equipment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 230001

## SECTION 230500

## COMMON WORK RESULTS FOR HVAC

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Piping materials and installation instructions common to most piping systems.
  - 2. Dielectric Fittings
  - 3. Escutcheons.
  - 4. Equipment support base and rails
  - 5. Equipment installation requirements common to equipment sections.
  - 6. Supports and anchorages.

## 1.2 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.

## 1.4 SUBMITTALS

- A. Welding Certificates.
- B. LEED Building Requirements
  - 1. General Requirements:  
The City of New York requires the Contractor to implement practices and procedures to meet the project's environmental goals, which include achieving a



LEED™ Green Building rating. Specific project goals which may impact this area of work are listed in the applicable paragraphs of this specification section. The Contractor shall ensure that the requirements related to these goals, 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, shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

2. Performance Criteria

All field applied adhesives, sealants (used as fillers), prime painting, and finished painting shall comply with the low VOC requirements called out in Division 1, Section 01015 - Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, & Architectural Coatings, and Section 09900 - Interior Paint.

C. LEED Building Submittal Requirements:

1. Provide for all field-applied adhesives, sealants (used as fillers), and paints: Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) limits of products submitted (If an MSDS does not include a product's VOC limits, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer can be submitted in addition to the MSDS to indicate the VOC limits).

1.5 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
  1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
  2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- C. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

PART 2 - PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

- A. Refer to individual Division 23 piping Sections for pipe, tube, and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

## 2.2 JOINING MATERIALS

- A. Refer to individual Division 23 piping Sections for special joining materials not listed below.
- B. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- C. Solvent Cements for Joining Plastic Piping:
  - 1. CPVC Piping: ASTM F 493.
  - 2. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

## 2.3 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Dielectric Unions: Factory-fabricated, union assembly, for 150psig minimum working pressure at 180 deg F

## 2.4 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.
- C. One-Piece, Cast-Brass Type: With set screw.
  - 1. Finish: Polished chrome-plated
- D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
  - 1. Finish: Polished chrome-plated

## 2.5 EQUIPMENT SUPPORT BASE AND RAILS

- A. Heavy gauge galvanized steel, unitized construction with integral base plate, fully insulated, continuous welded corner seams, pressure treated wood nailer, counter-flashing with screws. Internally reinforced to conform to plate load bearing factors.

## PART 3 - EXECUTION

## 3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 23 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Select system components with pressure rating equal to or greater than system operating pressure.
- K. Install escutcheons for penetrations of walls, ceilings, and floors.
- L. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.
- M. Verify final equipment locations for roughing-in.
- N. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

## 3.2 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
  2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- F. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
1. Comply with ASTM F 402, for safe-handling practice of cleaners, primers, and solvent cements.
  2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
  3. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
  4. PVC Nonpressure Piping: Join according to ASTM D 2855.
- G. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
- H. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.

### 3.3 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
  2. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

### 3.4 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- C. Install HVAC equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.

3.5 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to Division 05 Section "Metal Fabrications" for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment.
- C. Field Welding: Comply with AWS D1.1.

3.6 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor HVAC materials and equipment.
- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

END OF SECTION 230500

## SECTION 230513

## COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

## 1.2 COORDINATION

- A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
  1. Motor controllers.
  2. Torque, speed, and horsepower requirements of the load.
  3. Ratings and characteristics of supply circuit and required control sequence.
  4. Ambient and environmental conditions of installation location.

## PART 2 - PRODUCTS

## 2.1 GENERAL MOTOR REQUIREMENTS

- A. Comply with requirements in this Section except when stricter requirements are specified in HVAC equipment schedules or Sections.
- B. Comply with NEMA MG 1 unless otherwise indicated.

## 2.2 MOTOR CHARACTERISTICS

- A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.
- B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

## 2.3 POLYPHASE MOTORS

- A. Description: NEMA MG 1, Design B, medium induction motor.

- B. Efficiency: Energy efficient, in compliance with Energy Conservation Code of NYS, latest edition.
- C. Service Factor: 1.15.
- D. Multispeed Motors: Variable torque.
  - 1. For motors with 2:1 speed ratio, consequent pole, single winding.
  - 2. For motors with other than 2:1 speed ratio, separate winding for each speed.
- E. Rotor: Random-wound, squirrel cage.
- F. Bearings: Re-greasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
- G. Temperature Rise: Match insulation rating.
- H. Insulation: Class F.
- I. Code Letter Designation:
  - 1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
  - 2. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.
- J. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

#### 2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

- A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
- B. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
  - 1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
  - 2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
  - 3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
  - 4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.

#### 2.5 SINGLE-PHASE MOTORS

- A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
  - 1. Permanent-split capacitor.
  - 2. Split phase.
  - 3. Capacitor start, inductor run.
  - 4. Capacitor start, capacitor run.
- B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.

- C. Bearings: Pre-lubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
- D. Motors 1/20 HP and Smaller: Shaded-pole type.
- E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 230513



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## SECTION 230529

## HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Fastener systems.
  - 2. Equipment supports.

## 1.2 PERFORMANCE REQUIREMENTS

- A. Provide trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
  - 1. Provide supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
  - 2. Provide equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

## 1.3 SPECIAL REQUIREMENTS

- A. All supports and hangers for areas above all spaces shall be isolation hangers. Refer to Vibration Control specification section.

## 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for the following; include Product Data for components:
  - 1. Equipment supports.
- C. Welding certificates.

## 1.5 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

## PART 2 - PRODUCTS

## 2.1 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

- B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated or stainless- steel anchors, for use in hardened Portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

## 2.2 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

## 2.3 ROOF PIPE SUPPORTS

- A. A pipe support with "strut" used to support roof-mounted electrical conduit, condensate piping, gas pipes, and other mechanical piping. Unique design absorbs thermal expansion and contraction of pipes thus preventing damage to the roof membrane. The base is gently rounded to allow movement upon the roof to prevent gouging the roof membrane. Pipes rest on a strut system which is made of hot-dip galvanized steel. The pipe support base is made of polycarbonate resin, and all other metal parts are made of hot-dip galvanized or stainless steel. Pipe stand shall accommodate up to 2 1/2" pipe (inside diameter) or up to 3" (outside diameter) pipes.
- B. Provide deck plate beneath pipe stand. The deck plate is a rigid plate which supports other mechanical devices, pedestals or pipe supports by providing a flat smooth surface upon which supporting devices may rest to protect roof-top membranes and to further distribute roof top weight to protect sub-membrane insulation and decking material. The design of the deck plate allows rooftop pipe supports, pedestals and other supporting devices to be installed without penetrating the roof membrane and further allows the daily movement of a piping system to properly carry the load being borne by the supporting devices as thermal expansion and contraction moves the roof system of pipes or devices supported by the deck plate. The deck plate shall be constructed of 16, 18 or 20 gauge stainless steel plate which prevents rusting, enhances the longevity of the roof, and provides maximum operational efficiency for other rooftop pipe stands, pedestals and support devices.

## 2.4 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
  - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
  - 2. Design Mix: 5000-psi, 28-day compressive strength.

## PART 3 - EXECUTION

### 3.1 HANGER AND SUPPORT INSTALLATION

- A. Fastener System Installation:
  - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- B. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- C. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- D. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- E. Install lateral bracing with pipe hangers and supports to prevent swaying.
- F. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- G. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

### 3.2 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

### 3.3 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux immediately.
  4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

### 3.4 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

- B. Trim excess length of continuous-thread hanger and support rods to 1 inch.

### 3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 09
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

### 3.6 HANGER AND SUPPORT SCHEDULE

- A. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
  - 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction, to attach to top flange of structural shape.
  - 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
  - 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
  - 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
  - 6. C-Clamps (MSS Type 23): For structural shapes.
  - 7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
    - a. Light (MSS Type 31): 750 lb.
    - b. Medium (MSS Type 32): 1500 lb.
    - c. Heavy (MSS Type 33): 3000 lb.
  - 8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
  - 9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
- B. Use mechanical-expansion anchors instead of building attachments where required in concrete construction. Use of powder actuated anchors shall be confirmed with Commissioner.

END OF SECTION 230529

SECTION 230548

VIBRATION CONTROLS FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
  - 1. Isolation pads.
  - 2. Isolated Roof Curb

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Delegated-Design Submittal: For vibration isolation and seismic-restraint calculations and details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Welding certificates
- D. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Kinetics Noise Control.
  - 2. Mason Industries.
  - 3. Vibration Eliminator Co., Inc.
  - 4. Vibration Mountings & Controls, Inc.
- B. Pads <MWP>: Arranged in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
  - 1. Resilient Material: Oil- and water-resistant neoprene.
- C. Spring Isolation Roof Curb: <IRC>

1. Curb type isolator with integral spring isolators, designed to provide a complete roof curb installation. All rooftop air-handling units shall be supported by vibration isolation curbs.
2. The vibration isolation curbs shall be complete assemblies designed to resiliently support equipment at the specified elevation and shall constitute a fully enclosed air- and weather-tight system. The isolation curb shall consist of an upper support rail with supply and return duct supports on which the equipment and duct openings rest and a lower support curb which is attached to the roof structure, separated by free-standing, un-housed, laterally stable steel springs. The upper support rail shall provide continuous structural support for the rooftop equipment and shall be designed to provide isolation against casing radiated vibration in the rooftop equipment housing and structure borne vibration from rotating and mechanical equipment in the rooftop package. The upper support rail shall consist of a structural channel with sufficient elevation above the spring to preclude interference with the rooftop equipment and permit access to inspect the isolation system after placement of the rooftop equipment. Attachment to the RTU by weather seal attachment bolt heads is not permitted. The lower support curb shall be a formed channel fabricated of heavy gauge galvanized steel with a continuous 1-1/2 inch x 1-1/2 inch (38 mm x 38 mm) nominal wood nailer attached to the isolation support pedestals. The isolation support pedestal, which includes the seismic and wind load restraints, shall be bolted or welded to the building support steel to suitably transfer seismic and wind load forces to the building structure. The lower support curb shall have a minimum elevation of 14 inches (356 mm) from the top of the wood nailer to the base of the curb. Spring components shall be free-standing, un-housed, laterally stable steel springs. Springs shall have a lateral stiffness greater than 1.2 times the rated vertical stiffness and shall be designed for a typical 50% overload to solid. All springs shall have a polyester powder coated finish and be color coded to indicate load capacity. Spring coils shall rest on minimum 0.25 inch (6 mm) neoprene noise pads. The isolation curb system shall be complete with cross-bracing as required as a part of the upper and lower assemblies. Supply air and return duct shall be flexibly attached by the contractor to prevent transmission of vibration to the building structure. Airborne noise control packages, if required, shall be supported by the roof structure within the curb and shall have no rigid contact with the isolation curb. Vibration isolators shall be selected by the manufacturer for each specific application to comply with deflection requirements as shown on the Vibration Isolation Schedule or as indicated on the project documents. Roof Curb Rails shall be Model ESR as manufactured by Kinetics Noise Control, Inc. or approved equal.

### PART 3 - EXECUTION

#### 3.1 VIBRATION-CONTROL DEVICE INSTALLATION

- A. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- B. Drilled-in Anchors:
  1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the Commissioner if reinforcing steel or other embedded

- items are encountered during drilling. Locate and avoid pre-stressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
  3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
  4. Set anchors to manufacturer's recommended torque, using a torque wrench.
  5. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.2 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
  1. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
  2. Test to 90 percent of rated proof load of device.
  3. Measure isolator deflection.
  4. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.
- C. Prepare test and inspection reports.

3.3 HVAC VIBRATION-CONTROL SCHEDULE

A. As indicated below unless otherwise noted on plans

Equipment Name & Tag	Location	Isolator Type	Base Type	Min Deflection
Rooftop AC Unit	Roof	Isolated Roof Curb <ISR>	Steel Structure.	2 inches static deflection minimum

END OF SECTION 230548



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## SECTION 230553

## IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Equipment labels.
  2. Warning signs and labels.
  3. Duct labels.

## 1.2 SUBMITTAL

- A. Product Data: For each type of product indicated.

## PART 2 - PRODUCTS

## 2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
1. Material and Thickness: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
  2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
  4. Fasteners: Stainless-steel rivets or self-tapping screws.
  5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
  2. Letter Color: White
  3. Background Color: Black
  4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
  5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
  7. Fasteners: Stainless-steel rivets or self-tapping screws.
  8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

- D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

## 2.2 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: Red.
- C. Background Color: White.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Label Content: Include caution and warning information, plus emergency notification instructions.

## 2.3 DUCT LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: Refer to color schedule below.
- C. Background Color: White.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

- I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.
  1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.
  2. Lettering Size: At least 1-1/2 inches high.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

#### 3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

#### 3.3 DUCT LABEL INSTALLATION

- A. Install plastic-laminated or self-adhesive duct labels with permanent adhesive on air ducts in the following color codes:
  1. Black lettering on white background.
  2. ASME A13.1 Colors and Designs: For hazardous material exhaust.
- B. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 20 feet in each space where ducts are exposed or concealed by removable ceiling system.

END OF SECTION 230553

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SECTION 230593

TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Balancing Air Systems:
    - a. Variable-volume air systems.
    - b. Constant air volume systems

1.2 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. NEBB: National Environmental Balancing Bureau.
- C. TAB: Testing, adjusting, and balancing.
- D. TABB: Testing, Adjusting, and Balancing Bureau.
- E. TAB Specialist: An entity engaged to perform TAB Work.

1.3 SUBMITTALS

- A. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.
- B. Certified TAB reports.

1.4 QUALITY ASSURANCE

- A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC, NEBB or TABB.
  - 1. TAB Technician: Employee of the TAB contractor and who is certified by AABC, NEBB or TABB as a TAB technician.
- B. Certify TAB field data reports and perform the following:
  - 1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
  - 2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.
- C. TAB Report Forms: Use standard TAB contractor's forms approved by Architect.

- D. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

## PART 2 - PRODUCTS (Not Applicable)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.
- B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.
- C. Examine the approved submittals for HVAC systems and equipment.
- D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- E. Examine ceiling plenums used for return air to verify that they meet the leakage class of connected ducts as specified in Division 23 Section "Metal Ducts" and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.
- F. Examine equipment performance data including fan and pump curves.
1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
  2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.
- G. Examine system and equipment installations and verify that field quality control testing, cleaning, and adjusting specified in individual Sections have been performed.
- H. Examine test reports specified in individual system and equipment Sections.
- I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- J. Examine operating safety interlocks and controls on HVAC equipment.
- K. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

### 3.2 PREPARATION

- A. Prepare a TAB plan that includes strategies and step-by-step procedures.
- B. Complete system-readiness checks and prepare reports. Verify the following:
  - 1. Permanent electrical-power wiring is complete.
  - 2. Automatic temperature-control systems are operational.
  - 3. Equipment and duct access doors are securely closed.
  - 4. Balance, smoke, and fire dampers are open.
  - 5. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
  - 6. Windows and doors can be closed so indicated conditions for system operations can be met.

### 3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" or "SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.
  - 1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
  - 1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
  - 2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Division 23 Section "HVAC Insulation."
- C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

### 3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Prepare schematic diagrams of systems' "as-built" duct layouts.
- C. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- D. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.
- E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- F. Verify that motor starters are equipped with properly sized thermal protection.



- G. Check dampers for proper position to achieve desired airflow path.
- H. Check for airflow blockages.
- I. Check condensate drains for proper connections and functioning.
- J. Check for proper sealing of air-handling-unit components.
- K. Verify that air duct system is sealed as specified in Division 23 Section "Metal Ducts."

### 3.5 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

- A. **Compensating for Diversity:** When the total airflow of all terminal units is more than the indicated airflow of the fan, place a selected number of terminal units at a minimum set-point airflow with the remainder at maximum airflow condition until the total airflow of the terminal units equals the indicated airflow of the fan. Select the reduced-airflow terminal units so they are distributed evenly among the branch ducts.
- B. **Pressure-Independent, Variable-Air-Volume Systems:** After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:
  - 1. Set outdoor-air dampers at minimum, and set return- and exhaust-air dampers at a position that simulates full-cooling load.
  - 2. Select the terminal unit that is most critical to the supply-fan airflow and static pressure. Measure static pressure. Adjust system static pressure so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
  - 3. Measure total system airflow. Adjust to within indicated airflow.
  - 4. Set terminal units at maximum airflow and adjust controller or regulator to deliver the designed maximum airflow. Use terminal-unit manufacturer's written instructions to make this adjustment. When total airflow is correct, balance the air outlets downstream from terminal units the same as described for constant-volume air systems.
  - 5. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow the same as described for constant-volume air systems.
    - a. If air outlets are out of balance at minimum airflow, report the condition but leave outlets balanced for maximum airflow.
  - 6. Re-measure the return airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.
    - a. Adjust the fan and balance the return-air ducts and inlets the same as described for constant-volume air systems.
  - 7. Measure static pressure at the most critical terminal unit and adjust the static-pressure controller at the main supply-air sensing station to ensure that adequate static pressure is maintained at the most critical unit.
  - 8. Record final fan-performance data.

### 3.6 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

- A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
1. Measure total airflow.
    - a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.
  2. Measure fan static pressures as follows to determine actual static pressure:
    - a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.
    - b. Measure static pressure directly at the fan outlet or through the flexible connection.
    - c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
    - d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.
  3. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.
    - a. Report the cleanliness status of filters and the time static pressures are measured.
  4. Measure static pressures entering and leaving other devices, such as sound traps, heat-recovery equipment, and air washers, under final balanced conditions.
  5. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
  6. Obtain approval from Architect for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in Division 23 Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
  7. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
- B. Adjust volume dampers for main duct, sub-main ducts, and major branch ducts to indicated airflows within specified tolerances.
1. Measure airflow of sub-main and branch ducts.
    - a. Where sufficient space in sub-main and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
  2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
  3. Re-measure each sub-main and branch duct after all have been adjusted. Continue to adjust sub-main and branch ducts to indicated airflows within specified tolerances.
- C. Measure air outlets and inlets without making adjustments.
1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

- D. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.
  - 1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
  - 2. Adjust patterns of adjustable outlets for proper distribution without drafts.

### 3.7 PROCEDURES FOR MOTORS

- A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:
  - 1. Manufacturer's name, model number, and serial number.
  - 2. Motor horsepower rating.
  - 3. Motor rpm.
  - 4. Efficiency rating.
  - 5. Nameplate and measured voltage, each phase.
  - 6. Nameplate and measured amperage, each phase.
  - 7. Starter thermal-protection-element rating.
- B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass of the controller to prove proper operation. Record observations including name of controller manufacturer, model number, serial number, and nameplate data.

### 3.8 TOLERANCES

- A. Set HVAC system's air flow rates and water flow rates within the following tolerances:
  - 1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent.
  - 2. Air Outlets and Inlets: Plus or minus 10 percent.
  - 3. Heating-Water Flow Rate: Plus or minus 10 percent.

### 3.9 REPORTING

- A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

### 3.10 FINAL REPORT

- A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
  - 1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
  - 2. Include a list of instruments used for procedures, along with proof of calibration.
- B. Final Report Contents: In addition to certified field-report data, include the following:

1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance; do not include Shop Drawings and product data.

- C. General Report Data: In addition to form titles and entries, include the following data:
1. Title page.
  2. Name and address of the TAB contractor.
  3. Project name.
  4. Project location.
  5. Architect's name and address.
  6. Engineer's name and address.
  7. Contractor's name and address.
  8. Report date.
  9. Signature of TAB supervisor who certifies the report.
  10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
  11. Summary of contents including the following:
    - a. Indicated versus final performance.
    - b. Notable characteristics of systems.
    - c. Description of system operation sequence if it varies from the Contract Documents.
  12. Nomenclature sheets for each item of equipment.
  13. Data for terminal units, including manufacturer's name, type, size, and fittings.
  14. Notes to explain why certain final data in the body of reports vary from indicated values.
  15. Test conditions for fans and pump performance forms including the following:
    - a. Settings for outdoor-, return-, and exhaust-air dampers.
    - b. Conditions of filters.
    - c. Cooling coil, wet- and dry-bulb conditions.
    - d. Face and bypass damper settings at coils.
    - e. Fan drive settings including settings and percentage of maximum pitch diameter.
    - f. Inlet vane settings for variable-air-volume systems.
    - g. Settings for supply-air, static-pressure controller.
    - h. Other system operating conditions that affect performance.
- D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
1. Quantities of outdoor, supply, return, and exhaust airflows.
  2. Duct, outlet, and inlet sizes.
  3. Terminal units.

### 3.11 ADDITIONAL TESTS

- A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 230593

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SECTION 230700  
HVAC INSULATION

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Insulation Materials:
  - a. Mineral fiber.
2. Insulating cements.
3. Adhesives.
4. Mastics.
5. Sealants.
6. Factory-applied jackets.
7. Field-applied fabric-reinforcing mesh.
8. Field-applied jackets.
9. Tapes.
10. Securements.
11. Corner angles.

## B. Related Sections:

1. Division 22 Section "Plumbing Insulation."
2. Division 23 Section "Metal Ducts" for duct liners.

## 1.2 SUBMITTALS

## A. Product Data: For each type of product indicated.

## B. Shop Drawings:

1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail insulation application at pipe expansion joints for each type of insulation.
3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
4. Detail removable insulation at piping specialties, equipment connections, and access panels.
5. Detail application of field-applied jackets.

## C. Field quality-control reports.

## 1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

## PART 2 - PRODUCTS

### 2.1 INSULATION MATERIALS

- A. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I with factory-applied ASJ jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. CertainTeed Corp.; Duct Wrap.
    - b. Johns Manville; Microlite.
    - c. Knauf Insulation; Duct Wrap.
    - d. Owens Corning; All-Service Duct Wrap.

### 2.2 INSULATING CEMENTS

- A. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449/C 449M.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Insulco, Division of MFS, Inc.; SmoothKote.
    - b. P. K. Insulation Mfg. Co., Inc.; PK No. 127, and Quik-Cote.
    - c. Rock Wool Manufacturing Company; Delta One Shot.

### 2.3 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
- B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
  1. Products: Subject to compliance with requirements, provide one of the following:

- a. Childers Products, Division of ITW; CP-82.
  - b. Foster Products Corporation, H. B. Fuller Company; 85-20.
  - c. ITW TACC, Division of Illinois Tool Works; S-90/80.
  - d. Marathon Industries, Inc.; 225.
  - e. Mon-Eco Industries, Inc.; 22-25.
2. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. ASJ Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Childers Products, Division of ITW; CP-82.
    - b. Foster Products Corporation, H. B. Fuller Company; 85-20.
    - c. ITW TACC, Division of Illinois Tool Works; S-90/80.
    - d. Marathon Industries, Inc.; 225.
    - e. Mon-Eco Industries, Inc.; 22-25.
  2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

#### 2.4 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.
1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Childers Products, Division of ITW; CP-35.
    - b. Foster Products Corporation, H. B. Fuller Company; 30-90.
    - c. ITW TACC, Division of Illinois Tool Works; CB-50.
    - d. Marathon Industries, Inc.; 590.
    - e. Mon-Eco Industries, Inc.; 55-40.
    - f. Vimasco Corporation; 749.
  2. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm at 43-mil dry film thickness.
  3. Service Temperature Range: Minus 20 to plus 180 deg F
  4. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight.
  5. Color: White.
- C. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Childers Products, Division of ITW; CP-10.



- b. Foster Products Corporation, H. B. Fuller Company; 35-00.
  - c. ITW TACC, Division of Illinois Tool Works; CB-05/15.
  - d. Marathon Industries, Inc.; 550.
  - e. Mon-Eco Industries, Inc.; 55-50.
  - f. Vimasco Corporation; WC-1/WC-5.
2. Water-Vapor Permeance: ASTM F 1249, 3 perms at 0.0625-inch dry film thickness.
  3. Service Temperature Range: Minus 20 to plus 200 deg F
  4. Solids Content: 63 percent by volume and 73 percent by weight.
  5. Color: White.

## 2.5 SEALANTS

### A. Joint Sealants:

1. Joint Sealants for Cellular-Glass Products: Subject to compliance with requirements, provide one of the following:
  - a. Childers Products, Division of ITW; CP-76.
  - b. Foster Products Corporation, H. B. Fuller Company; 30-45.
  - c. Marathon Industries, Inc.; 405.
  - d. Mon-Eco Industries, Inc.; 44-05.
  - e. Pittsburgh Corning Corporation; Pittseal 444.
  - f. Vimasco Corporation; 750.

### B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Childers Products, Division of ITW; CP-76.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F
5. Color: White.
6. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## 2.6 FACTORY-APPLIED JACKETS

### A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.

## 2.7 FIELD-APPLIED FABRIC-REINFORCING MESH

### A. Woven Polyester Fabric: Approximately 1 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. inch in a Leno weave, for duct, equipment, and pipe.

1. Products: Subject to compliance with requirements, provide one of the following

- a. Foster Products Corporation, H. B. Fuller Company; Mast-A-Fab.
- b. Vimasco Corporation; Elastafab 894.

## 2.8 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. Aluminum Jacket: Comply with ASTM B 209 Alloy 3003, 3005, 3105 or 5005, Temper H-14.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Childers Products, Division of ITW; Metal Jacketing Systems.
    - b. PABCO Metals Corporation; Surefit.
    - c. RPR Products, Inc.; Insul-Mate.
  2. Sheet and roll stock ready for shop or field sizing or Factory cut and rolled to size.
  3. Finish and thickness are indicated in field-applied jacket schedules.
  4. Moisture Barrier for Indoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
  5. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
  6. Factory-Fabricated Fitting Covers:
    - a. Same material, finish, and thickness as jacket.
    - b. Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
    - c. Tee covers.
    - d. Flange and union covers.
    - e. End caps.
    - f. Beveled collars.
    - g. Valve covers.
    - h. Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

## 2.9 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0835.
    - b. Compac Corp.; 104 and 105.
    - c. Ideal Tape Co., Inc., an American Biltrite Company; 428 AWF ASJ.
    - d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.
  2. Width: 3 inches
  3. Thickness: 11.5 mils
  4. Adhesion: 90 ounces force/inch in width.
  5. Elongation: 2 percent.
  6. Tensile Strength: 40 lbf/inch in width.
  7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

## 2.10 SECUREMENTS

- A. Aluminum Bands: ASTM B 209 Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing or closed seal.
1. Products: Subject to compliance with requirements, provide one of the following
    - a. Childers Products; Bands.
    - b. PABCO Metals Corporation; Bands.
    - c. RPR Products, Inc.; Bands.
- B. Insulation Pins and Hangers:
1. Nonmetal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate fastened to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
    - a. Products: Subject to compliance with requirements, provide one of the following:
      - 1) GEMCO; Nylon Hangers.
      - 2) Midwest Fasteners, Inc.; Nylon Insulation Hangers.
    - b. Baseplate: Perforated, nylon sheet, 0.030 inch thick by 1-1/2 inches in diameter.
    - c. Spindle: Nylon, 0.106-inch- diameter shank, length to suit depth of insulation indicated, up to 2-1/2 inches
    - d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
  2. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
    - a. Products: Subject to compliance with requirements, provide one of the following:
      - 1) GEMCO.
      - 2) Midwest Fasteners, Inc.
- C. Staples: Outward-clinching insulation staples, nominal 3/4-inch- (19-mm-) wide, stainless steel or Monel.
- D. Wire: 0.080-inch (2.0-mm) nickel-copper alloy or 0.062-inch (1.6-mm) soft-annealed, stainless steel.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. C & F Wire.
    - b. Childers Products.
    - c. PABCO Metals Corporation.
    - d. RPR Products, Inc.

## 2.11 CORNER ANGLES

- A. Aluminum Corner Angles: 0.040 inch (1.0 mm) thick, minimum 1 by 1 inch (25 by 25 mm), aluminum according to ASTM B 209 (ASTM B 209M), Alloy 3003, 3005, 3105 or 5005; Temper H-14.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

### 3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment, ducts and fittings, and piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment, duct system, and pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
  - 1. Install insulation continuously through hangers and around anchor attachments.
  - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to

- structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
  4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
  2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
  3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at **2 inches** o.c.
    - a. For below ambient services, apply vapor-barrier mastic over staples.
  4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
  5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct and pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- P. For above ambient services, do not install insulation to the following:
1. Vibration-control devices.
  2. Testing agency labels and stamps.
  3. Nameplates and data plates.
  4. Manholes.
  5. Handholes.
  6. Cleanouts.

### 3.3 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.

2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
  3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches (50 mm) below top of roof flashing.
  4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- C. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions. Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches
1. Comply with requirements in Division 07 Section "Penetration Firestopping" and fire-resistive joint sealers.

### 3.4 MINERAL-FIBER INSULATION INSTALLATION

- A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 50 percent coverage of duct and plenum surfaces.
  2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
  3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
    - a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    - b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    - c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    - d. Do not overcompress insulation during installation.
    - e. Impale insulation over pins and attach speed washers.
    - f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
  4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

- a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
  - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches
5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
  6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
  7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

### 3.5 FIELD-APPLIED JACKET INSTALLATION

- A. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

### 3.6 FINISHES

- A. Duct, Equipment, and Pipe Insulation with ASJ or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Division 09 painting Sections.
  1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
    - a. Finish Coat Material: Interior, flat, latex-emulsion size.
- B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.
- C. Color: Final color as selected by Commissioner. Vary first and second coats to allow visual inspection of the completed Work.
- D. Do not field paint aluminum or stainless-steel jackets.

### 3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
  1. Inspect ductwork, randomly selected by Commissioner, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to two location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.

2. Inspect field-insulated equipment, randomly selected by Commissioner, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each type of equipment. For large equipment, remove only a portion adequate to determine compliance.
  3. Inspect pipe, fittings, strainers, and valves, randomly selected by Commissioner, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, , two locations of threaded strainers, two locations of threaded valves, and two locations of flanged valves for each pipe service.
- C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

### 3.8 DUCT INSULATION SCHEDULE, GENERAL

#### A. Plenums and Ducts Requiring Insulation:

1. Indoor, concealed or exposed supply and outdoor air.
2. Indoor, concealed or exposed return located in non-conditioned space.
3. Indoor, concealed or exposed exhaust between isolation damper and penetration of building exterior.
4. Outdoor, concealed or exposed supply and return.

#### B. Items Not Insulated:

1. Metal ducts with duct liner of sufficient thickness to comply with Energy Conservation Code of New York State, 2010 edition.
2. Factory-insulated flexible ducts.
3. Factory-insulated plenums and casings.
4. Flexible connectors.
5. Vibration-control devices.
6. Factory-insulated access panels and doors.

### 3.9 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

- A. All ductwork insulation performance (R value) and thickness shall be in compliance with latest edition of Chapter 8 of Energy Conservation Code of NYS

### 3.10 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. Provide watertight jacketing with weatherproofing.
- C. Piping & Ductwork Exposed:
1. Aluminum

END OF SECTION 230700



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SECTION 230800

COMMISSIONING OF MECHANICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this section.
- B. Refer to 'LEED Requirements' under General Conditions for additional LEED requirements.

1.2 SUMMARY

- A. This section includes commissioning process requirements for HVAC&R systems, assemblies, and equipment.
- B. Related Sections:
  - 1. Refer to Section "General Commissioning Requirements" for general commissioning process requirements.

1.3 DESCRIPTION

- A. Refer to Section "General Commissioning Requirements" for the description of commissioning.

1.4 DEFINITIONS

- A. Refer to Section "General Commissioning Requirements" for definitions.

1.5 SUBMITTALS

- A. Paragraphs below are "Informational Submittals." See DDC General Conditions for definition of "Informational Submittals."
- B. Refer to Section "General Commissioning Requirements" for CxA's role.
- C. Refer to Section "Submittals" for specific requirements. In addition, provide the following:
- D. Certificates of readiness
- E. Certificates of completion of installation, pre-start, and startup activities.
- F. O&M manuals
- G. Test reports

## 1.6 QUALITY ASSURANCE

- A. Test Equipment Calibration Requirements: Contractors 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. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to coordination during the commissioning 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 mechanical contractor of Division 23 shall ultimately be responsible for all standard testing equipment for the HVAC&R system and controls system in Division 23, except for equipment specific to and used by TAB in their commissioning responsibilities. A sufficient quantity of two-way radios shall be provided by each subcontractor.
- B. Special equipment, tools and instruments (specific to a piece of equipment and only available from vendor) required for testing shall be included in the base bid price to the City of New York and left on site, except for stand-alone data logging equipment that may be used by the CxA.
- C. 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.
- D. Data logging equipment and software required to test equipment will be provided by the CxA, but shall not become the property of the City of New York.
- E. 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 an accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

## PART 3 - EXECUTION

### 3.1 GENERAL DOCUMENTATION REQUIREMENTS

- A. With assistance from the installing contractors, the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems

- B. **Red-lined Drawings:** 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:** 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 Instruction:** Contractor will provide demonstration and instruction as required by the specifications. A complete instruction plan and schedule must be submitted by the contractor to the CxA four weeks (4) prior to any instruction. A instruction agenda for each instruction session must be submitted to the CxA one (1) week prior the instruction session

### 3.2 CONTRACTOR'S RESPONSIBILITIES

- A. Perform commissioning tests at the direction of the CxA.
- B. Attend construction phase controls coordination meetings.
- C. Attend testing, adjusting, and balancing review and coordination meetings.
- D. Participate in HVAC&R 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 Mechanical system orientations and inspections, operation and maintenance manual submissions, instruction sessions, pipe and duct system testing, flushing and cleaning, equipment start-up, testing and balancing and task completion for Commissioner. Distribute preliminary schedule to commissioning team members.
- G. Update schedule as required throughout the construction period.
- H. Assist the CxA in all verification and functional performance tests.
- I. 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.
- 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. Participate in, and schedule vendors and contractors to participate in the instruction sessions.
- N. Provide written notification to the COMMISSIONER/GC and CxA Authority 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.
  - 2. Fire stopping in the fire rated construction, including fire and smoke damper installation, caulking, gasketing and sealing of smoke barriers.
  - 3. Fire detection and smoke detection devices furnished under other divisions of the specification.
- 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 Contractor
  - 1. Attend initial commissioning coordination meeting scheduled by the Commissioning Authority.
  - 2. Submit the site specific testing and balancing plan to the CxA and AE 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 contractor and the COMMISSIONER/GC.
  - 5. At the completion of testing and balancing work, and the submittal of the final testing and balancing report, notify the HVAC&R Contractor and the COMMISSIONER/GC.
  - 6. 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.
- R. Equipment Suppliers
  - 1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Commissioner, to keep warranties in force.
  - 2. Assist in equipment testing per agreements with contractors.
  - 3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.
- S. Refer to Division 01 Section "General Commissioning Requirements" for additional contractor responsibilities.

### 3.3 OWNER'S (CITY OF NEW YORK) RESPONSIBILITIES

- A. Refer to Division 01 Section "General Commissioning Requirements" for City of New York Responsibilities.

### 3.4 COMMISSIONER'S RESPONSIBILITIES

- A. Refer to Division 01 Section "General Commissioning Requirements" for Commissioner's Responsibilities.

### 3.5 CxA'S RESPONSIBILITIES

- A. Refer to Division 01 Section "General Commissioning Requirements" for CxA's Responsibilities.

### 3.6 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.

### 3.7 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 testing and balancing subcontractor ten (10) days in advance of the date of field verification. Notice will not include data points to be verified.
  - 2. 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.

### 3.8 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 HVAC&R contractor, testing and balancing Subcontractor, and HVAC&R Instrumentation and Control Subcontractor 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.

### 3.9 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 Section 230993 "Automatic Temperature Controls". Assist the CxA with preparation of testing plans.

- C. **Pipe system cleaning, flushing, hydrostatic tests, and chemical treatment:** Test requirements are specified in Division 23 piping Sections. HVAC&R Contractor shall prepare a pipe system cleaning, flushing, and hydrostatic testing plan. Provide cleaning, flushing, testing, and treating plan and final reports to the CxA. Plan shall include the following:
1. Sequence of testing and testing procedures for each section of pipe to be tested, identified by pipe zone or sector identification marker. Markers shall be keyed to Drawings for each pipe sector, showing the physical location of each designated pipe test section. Drawings keyed to pipe zones or sectors shall be formatted to allow each section of piping to be physically located and identified when referred to in pipe system cleaning, flushing, hydrostatic testing, and chemical treatment plan.
  2. Description of equipment for flushing operations.
  3. Minimum flushing water velocity.
  4. Tracking checklist for managing and ensuring that all pipe sections have been cleaned, flushed, hydrostatically tested, and chemically treated.
- D. **Refrigeration System Testing:** Provide technicians, instrumentation, tools, and equipment to test performance of chillers, cooling towers, 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.
- E. **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.
- F. **Vibration and Sound Tests:** Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.
- G. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. The following equipment and systems shall be evaluated:
1. Rooftop AC unit
  2. VAV Air Terminals
  3. Temperature Control System
  4. Ductwork
  5. Electric Heaters
  6. Exhaust Fans
  7. Testing, Adjusting and Balancing

3.10 DEFICIENCIES/NON-CONFORMANCE, COST OF RETESTING, FAILURE DUE TO MANUFACTURER DEFECT

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to deficiencies/non-conformance, cost of retesting, or failure due to manufacturer defect.

3.11 APPROVAL

- A. Refer to Division 01 Section "General Commissioning Requirements" for approval procedures.



3.12 DEFERRED TESTING

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to deferred testing.

3.13 OPERATION AND MAINTENANCE MANUALS

- A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in Division 01.
- B. Refer to Division 01 Section "General Commissioning Requirements" for the AE and CxA roles in the Operation and Maintenance Manual contribution, review and approval process.

3.14 INSTRUCTION OF OWNER (CITY OF NEW YORK) PERSONNEL

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to instruction.

END OF SECTION 230800

## SECTION 230993

## TEMPERATURE CONTROL FOR HVAC

## PART 1 - GENERAL REQUIREMENTS

## 1.1 General

- A. Description of Work: Provide all labor, materials, equipment and services required to furnish an automatic temperature control system that conforms to the plans and specifications and meets the requirements of the heating, ventilating and air-conditioning systems serving the building.
- B. The Contractor shall provide all necessary information and required field supervision for a complete and operable automatic temperature control system.
- C. The Contractor shall be responsible for a complete system of electronic automatic temperature controls and provide all material, components, devices, thermostats, safety devices, control panels, control dampers, controllers, transformers, actuators, sensing devices, time clocks, relays, control wiring diagrams (line and low voltage), interlocking wiring, smoke detectors, labor, etc. indicated, required or specified.
- D. The temperature control system shall be electric/electronic and include electronic sensors and electric actuators unless noted otherwise. Include all work required for a complete operational system as defined in the entire set of drawings and specifications, including but not limited to associated specifications for mechanical and electrical work, and all contract drawings.
- E. The Contractor shall furnish all line voltage and low voltage wiring, conduit, panels, and accessories for a complete operational control system. The Contractor shall be responsible for all electrical work associated with the automatic temperature control system, any interface to any other systems including but not limited to HVAC and plumbing systems, and as shown in the contract documents. All line and low voltage shall be in accordance with Division 26 requirements. All final electrical connections to each stand-alone controller is the responsibility of the contractor.
- F. The Contractor shall furnish all wells for water monitoring devices, flow switches, and alarms to be installed.

## 1.2 Related Work

- A. Drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

## 1.3 Quality Assurance

- A. Materials and equipment shall be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and shall be manufacturer's latest standard design that complies with the specification requirements.
- B. Contractor shall have the responsibility for the complete installation and documented verification for proper operation of the control system that shall include as a

minimum, point to point checkout, sensor calibration, verification of programmed sequences. Supplier shall have an in-place support facility within proximity of the site with technical staff, spare parts inventory, all necessary test and diagnostic equipment and a maintained service organization consisting of competent servicemen, for a period of not less than one year. On-site emergency service shall be available on a 24-hour, 7-day-a-week basis.

#### 1.4 Submittals

- A. Submit for approval shop drawings, bill of material, product data sheets, points list, sequence of operations, valve and damper schedules, program flow charts and all product samples required prior to the commencement of any field installation work. Indicate at the beginning of each submittal, all substitutions and deviations from requirements of Contract Documents. Shop drawing submittals shall be complete full size drawings, 11" x 17" minimum, and include sufficient data to indicate complete compliance with Contract Documents.

#### 1.5 Owner's Manuals

- A. Submit two (2) draft copies of Operator's manual for review. After review by authorized representative, the contractor shall incorporate review comments and shall submit four (4) interim final copies. Upon completion of project and acceptance of project by the City of New York, submit six (6) copies of final "as built" manuals and one (1) reproducible copy (3-mil sepia Mylar). The Operator's manual shall include the same information that was furnished with the manuals turned over for the base building and shall match the format.

#### 1.6 Work Performance Schedule

- A. A time-phased schedule for delivery, installation, and acceptance of components for the complete system shall be prepared. Submit this schedule to the City of New York within five (5) days after award of contract. Submit updates and changes to this schedule promptly to the City of New York.

#### 1.7 Warranty

- A. The Contractor shall warranty the ATC system to be free from defects in workmanship and material for a period of one (1) year from the date of acceptance by the City of New York. During the warranty period, the Contractor shall furnish all labor to repair or replace all items or components that fail due to defects in workmanship or material.

#### 1.8 Instruction

- A. The Contractor shall provide competent instructors to give full instruction to designated personnel in the adjustment, operation and maintenance of the system installed rather than a general instruction course. Instructors shall be thoroughly familiar with all aspects of the subject matter they are to teach. All instruction shall be held during normal work hours of 8:00 a.m. to 4:30 p.m. weekdays. Provide 4 hours of instruction.

## PART 2 – PRODUCTS

## 2.1 Acceptable Manufacturers/Installers

- A. The automatic temperature control system and all components shall be Alerton BACtalk by ABM, Honeywell BACnet by Factory Branch Office or Siemens by Factory Branch Office

## 2.2 Automatic Controls

- A. Furnish and install as herein specified, a complete automatic temperature control system of the DDC electronic type. All temperature controls under this subcontract are to be fully modulating type, except where noted otherwise. The system shall be complete in all respects including sensors, valves, dampers, relays, etc. to provide the functions as hereinafter described, regardless of whether or not said sensors, relay etc., are specifically mentioned hereinafter.

## 2.3 Operator Interface

- A. The system shall be capable of supporting an unlimited number of clients using standard Web browser. Systems requiring additional software (to enable a standard Web browser) to be resident on the client machine, or manufacture-specific browsers shall not be acceptable.
- B. The Web browser software shall run on any operating system and system configuration that is supported by the Web browser. Systems that require specific machine requirements in terms of processor speed, memory, etc., in order to allow the Web browser to function with the Building Management System (BMS), shall not be acceptable.
- C. The Web browser client shall support at a minimum, the following functions: User log-on identification and password shall be required. If an unauthorized user attempts access, notice of access failure shall be displayed. Security using authentication and encryption techniques to prevent unauthorized access shall be implemented. HTML programming shall not be required to display system graphics or data on a Web page. HTML editing of the Web page shall be allowed if the user desires a specific look or format. Storage of the graphical screens shall be in the Network Area Controller (NAC), without requiring any graphics to be stored on the client machine. Systems that require graphics storage on each client are not acceptable. Real-time values displayed on a Web page shall update automatically without requiring a manual "refresh" of the Web page. Users shall have administrator-defined access privileges. Graphic screens on the Web Browser client shall support hypertext links to other locations on the Internet or on Intranet sites, by specifying the Uniform Resource Locator (URL) for the desired link.
- D. Alarms: Alarm feature shall allow user configuration of criteria to create, route, and manage alarms and events. It shall be possible for specific alarms from specific points to be routed to specific alarm recipients. The alarm management portion of the user interface shall, at the minimum, provide the following functions: Allow configuration to generate alarms on any numeric, binary, or data point in the system, Generate alarm records that contain a minimum of a timestamp, original state, acknowledged state, alarm class and priority, Allow the establishment of alarm classes that provide the routing of alarms with similar characteristics to common recipients, Allow a user, with the appropriate security level, to manage alarms - including sorting, acknowledging, and tagging alarms and Reports and Summaries

- E. Schedules: A graphical display for time-of-day scheduling and override scheduling of building operations shall be provided. At a minimum, the following functions shall be provided: Regular schedules, Repeating schedules and Exception Schedules. Weekly schedules shall be provided for each group of equipment with a specific time use schedule. It shall be possible to define one or more exception schedules for each schedule including references to calendars. Monthly calendars shall be provided that allow for simplified scheduling of holidays and special days. Holidays and special days shall be user-selected with the pointing device or keyboard.
- F. Password: Multiple-level password access protection shall be provided to allow the user/manager to user interface control, display, and database manipulation capabilities deemed appropriate for each user, Based on an assigned password. Each user shall have the following: a user name, a password, and access levels. The system shall provide the capability to require a password of minimum length and require a combination of characters and numerical or special characters. When entering or editing passwords, the system shall not echo the actual characters for display on the monitor. The system shall provide unlimited flexibility with access rights. A minimum of four levels of access shall be provided along with the ability to customize the system to provide additional levels. A minimum of 100 unique passwords shall be supported. Operators shall be able to perform only those commands available for their respective passwords. Display of menu selections shall be limited to only those items defined for the access level of the password used to log-on. The system shall automatically generate a report of log-on/log-off and system activity for each user. All log data shall be available in .pdf, .txt, and .csv formats.
- G. Dynamic Color Graphics: The graphics application program shall be supplied as an integral part of the User Interface. The graphics applications shall include a create/edit function and a runtime function. The system architecture shall support an unlimited number of graphics documents (graphic definition files) to be generated and executed. The graphics shall be able to display real-time data that is acquired, derived, or entered. Graphics runtime functions –Each graphic application shall be capable of the following functions, All graphics shall be fully scalable, The graphics shall support a maintained aspect ratio, Multiple fonts shall be supported and Unique background shall be assignable on a per graphic basis. It shall be possible to change values (setpoints) and states in systems controlled equipment within the Web browser interface. A graphic editing tool shall be provided that allows for the creation and editing of graphic files. The graphic editor shall be capable of performing/defining all runtime binding.
- H. Historical Data Collection: All numeric, binary or data points in the system database shall allow their values to be logged over time (trend log). Each historical record shall include the point's name, a time stamp including time zone, and the point's value. The configuration of the historical data collection shall allow for recording data based on change of value or on a user-defined time interval. The configuration of the historical data collection shall allow for the collection process to stop or rollover when capacity has been reached. A historical data viewing utility shall be provided with access to all history records. This utility shall allow historical data to be viewed in a table or chart format. The history data table view shall allow the user to hide/show columns and to filter data based on time and date. The history data table shall allow exporting to .txt, .csv, or .pdf file formats. The historical data chart view shall allow different point histories to be displayed simultaneously, and also provide panning and zooming capabilities.
- I. Audit Log: For each log entry, provide the following data; Time and date, User ID,

Change or activity: i.e., Change setpoint, add or delete objects, commands, etc.

- J. Database Backup and Storage: The user shall have the ability to backup the System Controller databases.

## 2.4 Building Controllers

### A. Network Area Controller (NAC)

1. The NAC must provide the following hardware features as a minimum:
  - a. Communications: One 10/100 Mb Ethernet Port – RJ-45 connection, One RS-232 port, One RS-485 port (up to 57,600 baud).
  - b. Battery Backup: Battery backup provided for all on board functions including I/O, Battery is monitored and trickle charged, Battery maintains processor operation through power failures for a pre-determined interval, and then writes all data to flash memory, shuts the processor down, and maintains the clock for five years.
  - c. Environment: Must be capable of operation over a temperature range of 0°C to 55°C, must be capable of withstanding storage temperatures of between 0°C and 70°C and must be capable of operation over a humidity range of 5% to 95% RH, non-condensing
2. Automation network – The Network Area Controller (NAC) shall reside on the automation network. Each NAC shall support one or more sub-networks of controllers.
3. User Interface – Each Network Area Controller (NAC) shall have the ability to deliver a web based user interface as previously described. All computers connected physically or virtually to the automation network shall have access to the web based UI.
4. Power Failure – In the event of the loss of normal power, The Network Area Controller (NAC) shall continue to operate for a define period after which there shall be an orderly shutdown of all programs to prevent the loss of database or operating system software. Flash memory shall be incorporated for all critical controller configuration data. During a loss of normal power, the control sequences shall go to the normal system shutdown conditions. Upon restoration of normal power and after a minimum off-time delay, the controller shall automatically resume full operation without manual intervention through a normal soft-start sequence.
5. Certification – All controllers shall be listed by Underwriters Laboratories (UL).

### B. Advanced Application Controller

1. Control of AO's and BO's and monitoring of AI's and BI's are permitted on devices that conform to the requirements for the BACnet Advanced Application Controller (B-AAC) as identified in ASHRAE Standard 135. B-ASC's shall be provided with all supporting BACnet services as a local function. The device shall not depend upon any other devices for the

functionality of schedule or alarm activities. Alternatively, the B-ASC's or B-BC's that the device is dependent upon shall utilize an Uninterruptible Power Supply (UPS). A single piece of equipment shall utilize a single controller. Control functions for a single piece of equipment may not be divided among controllers.

C. Browser based Operator Interface Software

1. The system shall be capable of supporting an unlimited number of clients using standard web browser. Systems requiring additional software (to enable a standard web browser) to be resident on the client machine or manufacture-specific browsers shall not be acceptable.
2. The web browser software shall run on any operating system and system configuration that is supported by the web browser. Systems that require specific machine requirements in terms of processor speed, memory, etc., in order to allow the web browser to function with the building automation system (bas), shall not be acceptable.
3. The web browser client shall support at a minimum, the following functions:
  - a. User log-on identification and password shall be required. If an unauthorized user attempts access, notice of access failure shall be displayed. Security using authentication and encryption techniques to prevent unauthorized access shall be implemented.
  - b. Html programming shall not be required to display system graphics or data on a web page. Html editing of the web page shall be allowed if the user desires a specific look or format.
  - c. Storage of the graphical screens shall be in the Network Area Controller (NAC), without requiring any graphics to be stored on the client machine. Systems that require graphics storage on each client are not acceptable.
  - d. Real-time values displayed on a web page shall update automatically without requiring a manual "refresh" of the web page.
  - e. Users shall have administrator-defined access privileges. Depending on the access privileges assigned, the user shall be able to perform the following:
    - (1) Modify common application objects, such as schedules and setpoints in a graphical manner.
    - (2) Commands binary objects to start and stop.
    - (3) View logs and charts.
    - (4) View alarms.
  - f. Graphic screens on the web browser client shall support hypertext links to other locations on the internet or on intranet sites, by specifying the uniform resource locator (url) for the desired link.

D. Alarms

1. Alarm feature shall allow user configuration of criteria to create, route, and manage alarms and events. It shall be possible for specific alarms from specific points to be routed to specific alarm recipients. The alarm management portion of the user interface shall: allow configuration to generate alarms on any numeric, binary, or data point in the system; generate alarm records that contain a minimum of a timestamp, original state, acknowledged state, alarm class and priority; allow the establishment of alarm classes that provide the routing of alarms with similar characteristics to common recipients; allow a user, with the appropriate security level, to manage alarms - including sorting, acknowledging, and tagging alarms.

- E. Reports and summaries
1. Reports and summaries shall be generated and directed to the user interface displays, with subsequent assignment to printers, or disk. As a minimum, the system shall provide the following reports: all points in the bas; all points in each bas application; all points in a specific controller; all points in a user-defined group of points; all points currently in alarm; all bas schedules; all user defined and adjustable variables, schedules, interlocks and the like. Reports shall be exportable to .pdf, .txt, or .csv formats. The system shall allow for the creation of custom reports and queries.
- F. Schedules
1. A graphical display for time-of-day scheduling and override scheduling of building operations shall be provided. At a minimum, the following functions shall be provided: regular schedules; repeating schedules; exception schedules; weekly schedules shall be provided for each group of equipment with a specific time use schedule; monthly calendars shall be provided that allow for simplified scheduling of holidays and special days. Holidays and special days shall be user-selected with the pointing device or keyboard.
- G. Password
1. Multiple-level password access protection shall be provided to allow the user/manager to user interface control, display, and database manipulation capabilities deemed appropriate for each user, based on an assigned password. Each user shall have the following: a user name, a password, and access levels. A minimum of 100 unique passwords shall be supported.
- H. Dynamic color graphics
1. The graphics application program shall be supplied as an integral part of the user interface. The graphics applications shall include a create/edit function and a runtime function. The system architecture shall support an unlimited number of graphics documents (graphic definition files) to be generated and executed. It shall be possible to change values (setpoints) and states in systems controlled equipment within the web browser interface. graphic editing tool – a graphic editing tool shall be provided that allows for the creation and editing of graphic files. The graphic editor shall be capable of performing/defining all runtime binding.
- i. Historical data collection
1. All numeric, binary or data points in the system database shall allow their values to be logged over time (trend log). Each historical record shall include the point's name, a time stamp including time zone, and the point's value; the configuration of the historical data collection shall allow for recording data based on change of value or on a user-defined time interval; a historical data viewing utility shall be provided with access to all history records. This utility shall allow historical data to be viewed in a table or chart format.
- J. Audit log
1. For each log entry, provide the following data: time and date; user id; change or activity: i.e., change setpoint, add or delete objects, commands, etc.
- K. Database backup and storage
1. The user shall have the ability to backup the system controller databases.



## 2.5 FIELD DEVICES

### A. General

1. All devices and equipment shall be approved for installation.

### B. Analog Sensors

1. All temperature sensors shall use thermistors with sensor accuracy of +/- .5 %f. Provide Minco or equal. The space sensor shall have a local display for space temperature and set point and a provision for adjusting the space set point. The sensor shall be submitted for approval by City of New York and Commissioner.
2. Humidity sensors shall be capacitive type with an accuracy of 2%. Provide Hycal or equal.
3. Static pressure transmitter shall be Setra c-c-264 or equal.

### C. VAV Terminal Unit Controller

1. BACnet-compliant controller with integrated actuator providing pressure-independent control of any single-duct variable air volume (VAV) box. It shall feature a built-in airflow sensor for pressure independent operation, five universal inputs (AIs or BIs) and six binary outputs (BOs). As a native BACnet controller is shall integrates seamlessly with the BACnet system communicating at up to 76.8 Kbps on a BACnet MS/TP LAN. The controller shall include a filter to reduce dust contamination.
2. The integral airflow sensor shall provide pressure independent operation of the VAV box. Each airflow sensor shall be factory-calibrated at multiple velocity points. Minimum, maximum, and reheat airflows can be entered either at a wall sensor or an operator workstation. A technician can adjust airflow parameters in the field during balancing to compensate for slight variations in box installation and type.
3. Damper Actuator: The direct-coupled, brushless actuator shall be high-reliability, maintenance-free ON-OFF/floating point control. Its universal V-bolt clamp assembly shall mount directly to the damper operating shaft.
4. All control algorithms shall be factory-loaded into nonvolatile flash memory and can be completely field-modified. The controller shall be capable of executing control algorithms independently of other equipment. All calibration, programming, and operator entered setup data is stored in flash memory for further assurance of stable, reliable, and independent operation.
5. Controller shall be Alerton Model VAVIH-SD or approved equal

### D. Wall Sensor:

1. Wall sensor shall include temperature, humidity and CO2 sensor with MS/TP capability provide users with control interface, test and balance tool and filed service tool.
2. The strengthened glass touchscreen user interface shall have capability to display the setpoint, room, and outside air temperature, relative humidity

- and CO2 level.
3. The thermistors are integrated with the device. The thermistors and humidity sensors shall be processed by an onboard microcontroller.

THERMISTORS

Type: NTC

Resistance - 100K Ohm at 77 °F (25 °C).

Time Constant\* - 20 minutes (to 63% of new temperature).

Stability\* - Maximum 0.036 °F (0.02 °C) drift per year.

Accuracy\* -  $\pm 0.36$  °F over range of 32 to 116 °F (0 to 47 °C);  $\pm 0.19$  °F at 72 °F (22 °C).

Power - 24 VAC.

CO2 SENSOR:

Operating Temperature Range - 32 to 122 °F (0 to 50 °C).

Power Consumption - 1.5 mA for measurement every 30s; 0.74 mA for measurement every 60s; 86  $\mu$ A for measurement every 15 min; 52  $\mu$ A for measurement every 60 min.

Measurement Range - 0 to 5000 ppm.

Accuracy -  $\pm 30$  ppm,  $\pm 3\%$  of reading.

HUMIDITY SENSOR:

Operating Temperature Range - 50 to 113 °F (10 to 45 °C).

Repeatability - Minimum  $\pm 0.5\%$  RH.

Accuracy -  $\pm 3\%$  at 10 to 90% RH,  $\pm 5\%$  at 0 to 10% and 90% to 100%RH.

Communications - Microset bus up to 115.2 Kbps.

Ratings - UL Standard for Safety 916; EMC Directive 89/336/EEC (European CE Mark)FCC Part 15.107 & 109, Class B, CFR47-15.

- a. Wall sensor shall be Alerton Model Ascent Microset MS4-THC or approved equal

PART 3 - EXECUTION

3.1 GENERAL

A. Installation Criteria

1. Space mounted devices are to be identical in appearance. All devices shall be mounted under the same style cover.
2. Room sensors and thermostats shall not be located on outside walls.
3. Provide all relays, switches, sources of electricity and all other auxiliaries,

accessories and connections necessary to make a complete operable system in accordance with the sequences specified.

4. Install controls so that adjustments and calibrations can be readily made. Controls are to be installed by the control equipment manufacturer.
5. Mount surface-mounted control devices, tubing and raceways on brackets to clear the final finished surface on insulation.
6. Conceal control conduit and wiring in all spaces except in the Mechanical Equipment Rooms and in unfinished spaces. Install in parallel banks with all changes in directions made at 90 degree angles.
7. Install control valves horizontally with the power unit up.
8. Unless otherwise noted, install wall-mounted sensors, thermostats and humidistats to meet ADA requirements. Submit device samples, locations, mounting heights and details for approval for all devices.
9. All relays, electrical wiring, panels, outputs, etc. to make a complete operational system, shall be provided and installed by this section. See sequences of operation for details.

#### B. Design Criteria

1. The Automatic Temperature Control (ATC) shall be programmed to start and stop the Rooftop Unit based on occupancy schedules as coordinated with the City of New York. The ATC shall also provide equipment interlocks as required.
2. Fire Alarm Interface for Fans
  - a. The Fire Alarm System shall provide outputs to notify the ATC of fire alarms.
  - b. All fan systems shall be stopped from the FAS. When the fan system stops, all associated dampers shall close.
  - c. All return and exhaust fans shall be stopped from the FAS. When the fan stops, all associated dampers shall close.

### 3.2 Electrical Installation Wiring And Materials

- A. The Contractor shall be responsible for all electrical control work associated with the ATC, HVAC and plumbing systems.
  1. Perform all wiring in accordance with all local and national codes including the NEC.
  2. Install all line voltage wiring, concealed or exposed, in conduit in accordance with the Division 26 specifications, NEC and local building code. Utilize #14 A.W.G. THWN conductors minimum throughout for power wiring (120 VAC or greater) except in conjunction with a manual starter.
  3. All low voltage electrical control wiring may be run in plenum rated cable above accessible hung ceilings. Plenum cable shall be run parallel to building lines and supported from the building structure (not from duct, pipe or associated hangers) with bridle rings.

4. Provide extension of 120 volt, 20 amp circuits and circuit breakers from emergency power panels for entire system, as required.
5. Provide all miscellaneous field device mounting and interconnecting control wiring for all mechanical systems.
6. All control and power wiring associated with the control of all automatic, fire/smoke or smoke dampers shall be installed in conduit, regardless of voltage. All control and power wiring for relays associated with the control of any automatic, fire/smoke or smoke damper shall be installed in conduit, regardless of voltage.
7. Provide electrical wall box and conduit sleeve for all wall mounted devices.
8. Fire stopping shall be provided for all penetrations of conduit, etc. through fire rated walls and floors and other fire rated separations.
9. Where conduit is required, it shall be steel electric metallic tubing (EMT), except that it shall be galvanized intermediate steel conduit where located within 8'-0" of the floor in mechanical spaces (or is otherwise exposed to mechanical damage), or is intended for embodiment in concrete.
10. Wires and cables shall have characteristics - in compliance with Articles 725 and/or 800 (as applicable) of the National Electrical Code - as described elsewhere in the specifications or drawings for this project, and shall be UL listed in accordance therewith.

### 3.3 Testing And Acceptance

#### A. Acceptance Testing

1. Submit for approval, a detailed acceptance test procedure designed to demonstrate compliance with contractual requirements.
2. Demonstrate system performance to City of New York for final system acceptance.

## PART 4 - SEQUENCES OF OPERATION

### 4.1 General

- A. Provide a complete and operational temperature control and building automation system based on the following points and sequence of operation. The system shall be complete as to sequences and standard control practices. The determined point list is the minimum amount of points that are to be provided. If additional points are required to meet the sequence of operation, they will be provided.
- B. BACnet Object List
  1. The following points as defined for each piece of equipment are designated as follows:
    - a. Binary Out (BO) - Defined as any two-state output (start/stop) (enable/disable), etc.

- b. Binary In (BI) - Defined as any two-state input (alarm, status), etc.
  - c. Analog In (AI) - Defined as any variable input (temperature) (position), etc.
  - d. Analog Out (AO) - Defined as any electrical variable output. 0–20mA, 4–20mA and 0–10VDC are the only acceptable analog outputs. The driver for analog outputs must come from both hardware and software resident in the controllers. Transducers will not be acceptable under any circumstance.
- C. All set points referenced in this section are subject to change and shall be adjustable from the BMS Operator Workstation and from a Portable Operators Terminal.

#### 4.2 Air Systems

##### A. Rooftop Air Conditioning Unit – VAV

1. Rooftop AC unit shall be furnished with factory BACnet DDC controls for complete stand-alone operation and shall tie into the base building Network Area Controller (NAC). The Contractor shall provide all required field wiring of controls that cannot be factory installed for proper AC unit operation. The Contractor shall connect the DDC controller to the NAC network for point monitoring and control from the operator interface.
2. Supply/return air duct smoke detector shall stop the fan upon the presence of smoke.
3. For fans greater than 2,000 CFM, provide a high discharge static pressure switch if dampers are located upstream of the fan and/or a low static pressure switch if dampers are located downstream of the fan to prevent mechanical damage if a damper fails to open. The switch shall stop the fan when duct pressure exceeds design. The fan shall remain off until the pressure switch is reset.
4. The AC unit shall be started by the BMS based upon a start time optimization program, time of day schedule, or manual command.
5. The outdoor air and exhaust air dampers shall be closed when the AC unit is off and when the AC unit is operating in the unoccupied mode unless there is a call for free cooling. During the occupied period the AC unit outside air damper shall open to minimum position and the exhaust and return air dampers shall open to their corresponding positions until overridden by the free cooling mode. The outdoor air minimum position shall be set with the air balancing contractor.
6. The supply and return fans shall start and shall slowly ramp to speed control set point. The supply fan variable speed drive shall be controlled to maintain the supply static pressure set point, as sensed at a point 2/3 downstream of the supply fan and the return fan variable speed drive shall be controlled to maintain a constant air volume differential, to maintain positive pressurization of the space. Both supply and return fans shall run continuously during the occupied period and shall cycle on/off during the unoccupied period to maintain the unoccupied space temperature set point.
7. The gas heater shall be controlled in sequence with the DX cooling and economizer dampers to maintain discharge air set point. The supply

temperature set-point shall be reset based on VAV box damper positions. All VAV box dampers associated with the AHU unit shall be polled every 15 minutes to determine position. If any damper is fully open, decrease the supply air temperature by .25°F. If no VAV damper is open greater than 75% open, increase the supply air temperature by .25°F.

8. Economizer dampers shall be enabled to provide free cooling whenever the outside air enthalpy is less than the air handling unit return air enthalpy. If economizer is available and there is a rise in temperature above the supply air temperature set point, the outside air damper(s) and/or exhaust air damper(s) shall be modulated open from minimum position to 100% open as necessary to maintain the temperature set point. The return air damper(s) shall modulate closed as the outside air and exhaust air damper(s) modulate open. If the outside air damper is 100% open and there is a further rise in the supply air temperature above setpoint, the outside air damper shall remain 100% open and the DX cooling shall stage as necessary to maintain supply air temperature set point. Economizer dampers shall modulate in sequence with the DX cooling subject to a mixed air low limit of 50°F (adj.).
9. When the unit is indexed off, the outdoor air and exhaust air damper shall close and the return air damper shall open. The heating and cooling shall be off.
10. Monitor differential pressures across filter and annunciate alarm when differential pressure set point is exceeded.
11. If the supply or return fans fail to operate an alarm shall be annunciated at the BMS and dampers shall be indexed to their normal off positions.
12. The fire alarm system shall signal the BMS when a fire alarm is present.
13. DDC points:
  - a. All points via Serial Network Interface to BMS

#### 4.3 MISCELLANEOUS

##### A. VAV Box

1. Provide one DDC controller and at least one temperature sensor for each VAV box. Coordinate factory mounting and wiring of controller, actuator, and transformer with the VAV box manufacturer. The Contractor shall be responsible for furnishing, installing, and wiring any controls not furnished, installed, or wired by others that are required for an operational system.
2. The VAV box and shall be indexed on when the associated Air Handling Unit serving it starts. The VAV box damper shall modulate to maintain the space temperature. As the space temperature rises above the space temperature set point, the DDC controller shall modulate the VAV box damper from the minimum to the maximum CFM setting as necessary to maintain the space temperature at set point. As the space temperature falls below the space temperature set point, the DDC controller shall modulate the VAV box damper to the minimum CFM set point. Upon a further fall in

space temperature, the electric reheat shall modulate open as necessary to maintain space temperature at set point.

3. High Occupancy Override: When the area the VAV box is serving is in the occupied mode and the space CO2 level exceeds the preset high limit set point (800 ppm, adj.) the VAV box shall override the current air flow set point to allow more outdoor air to enter the occupied space. The VAV box damper shall modulate to maintain the CO2 level below the preset high limit set point. CO2 sensors shall be located where shown on the plans. The electric reheat shall be controlled to maintain the space temperature at set point. The associated air handling unit serving this zone shall work in sequence with the terminal unit to ensure adequate fresh air is supplied by the unit in order to maintain the CO2 set point requirements.
4. The VAV box shall be capable to be programmed for occupied and unoccupied settings. The space temperature sensor shall have a push-button override to index the space to the occupied mode for a timed period.
5. DDC Points:
  - a. Supply Damper Control
  - b. Supply Damper Position
  - c. Supply Air Flow w/ High/Low Alarms
  - d. Electric Reheat Control
  - e. Space Temperature w/ High/Low Alarms
  - f. Space Temperature Set Point
  - g. Space CO2 w/ High Alarm

END OF SECTION 230993

## SECTION 231123

## FACILITY NATURAL-GAS PIPING

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Pipes, tubes, and fittings.
2. Piping specialties.
3. Piping and tubing joining materials.
4. Valves.
5. Pressure regulators.

## 1.2 PERFORMANCE REQUIREMENTS

## A. Minimum Operating-Pressure Ratings:

1. Piping and Valves: ANSI Class 300 minimum unless otherwise indicated.
2. Service Regulators: ANSI Class 300 minimum unless otherwise indicated.

## B. Natural-Gas System Pressure within Buildings: 0.5 psig or less.

## C. Natural-Gas System Pressures within Buildings: Primary (incoming gas service) pressure is more than 0.5 psig and is reduced to secondary pressure of 0.5 psig or less.

## D. Engineer restraints and anchors for natural-gas piping and equipment, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

## 1.3 SUBMITTALS

## A. Product Data: For each type of product indicated.

## B. Shop Drawings: For facility natural-gas piping layout. Include plans, piping layout and elevations, sections, and details for fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to building structure. Detail location of anchors, alignment guides, and expansion joints and loops.

## C. Engineering Submittal: For natural-gas piping and equipment indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of seismic restraints.
2. Design Calculations: Calculate requirements for selecting seismic restraints.



- D. Welding certificates.
- E. Field quality-control reports.
- F. Operation and maintenance data.

#### 1.4 QUALITY ASSURANCE

- A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

### PART 2 - PRODUCTS

#### 2.1 PIPES, TUBES, AND FITTINGS

- A. Steel Pipe: ASTM A 53 , black steel, Schedule 40, Type E or S, Grade B.
  - 1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
  - 2. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.
  - 3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.

#### 2.2 PIPING SPECIALTIES

- A. Appliance Flexible Connectors:
  - 1. Indoor, Fixed-Appliance Flexible Connectors: Comply with ANSI Z21.24.
  - 2. Indoor, Movable-Appliance Flexible Connectors: Comply with ANSI Z21.69.
  - 3. Outdoor, Appliance Flexible Connectors: Comply with ANSI Z21.75.
  - 4. Corrugated stainless-steel tubing with polymer coating.
  - 5. Operating-Pressure Rating: 0.5 psig.
  - 6. End Fittings: Zinc-coated steel.
  - 7. Threaded Ends: Comply with ASME B1.20.1.
  - 8. Maximum Length: 72 inches.
- B. Quick-Disconnect Devices: Comply with ANSI Z21.41.
  - 1. Copper-alloy convenience outlet and matching plug connector.
  - 2. Nitrile seals.
  - 3. Hand operated with automatic shutoff when disconnected.
  - 4. For indoor or outdoor applications.
  - 5. Adjustable, retractable restraining cable.

## C. Y-Pattern Strainers:

1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
2. End Connections: Threaded ends for NPS 2 (DN 50) and smaller.
3. Strainer Screen: mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
4. CWP Rating: 600 psig (862 kPa).

- D. Weatherproof Vent Cap: Cast- or malleable-iron increaser fitting with corrosion-resistant wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.

## 2.3 JOINING MATERIALS

- A. Joint Compound and Tape: Suitable for natural gas.
- B. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- C. Brazing Filler Metals: Alloy with melting point greater than 1000 deg F (540 deg C) complying with AWS A5.8/A5.8M. Brazing alloys containing more than 0.05 percent phosphorus are prohibited.

## 2.4 MANUAL GAS SHUTOFF VALVES

- A. General Requirements for Metallic Valves, NPS 2 (DN 50) and Smaller: Comply with ASME B16.33.

1. CWP Rating: 600 psig (862 kPa).
2. Threaded Ends: Comply with ASME B1.20.1.
3. Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.
4. Tamperproof Feature: Locking feature for valves where indicated.
5. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch (25 mm) and smaller.
6. Service Mark: Valves 1-1/4 inches (32 mm) to NPS 2 (DN 50) shall have initials "WOG" permanently marked on valve body.
7. "OG" indicated on valve body.

- B. Bronze Plug Valves: MSS SP-78.

1. Manufacturers:
  - a. Lee Brass Company.
  - b. McDonald, A. Y. Mfg. Co.
  - c. Walworth Co.
2. Body: Bronze, complying with ASTM B 584.
3. Plug: Bronze.
4. Ends: Threaded, socket, where indicated.
5. Operator: Square head or lug type with tamperproof feature where indicated.
6. Pressure Class: 600 psig (862 kPa).

7. Listing: Valves NPS 1 (DN 25) and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
8. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

## 2.5 DIELECTRIC UNIONS

### A. Manufacturers:

1. Capitol Manufacturing Company.
2. Central Plastics Company.
3. Hart Industries International, Inc.
4. McDonald, A. Y. Mfg. Co.
5. Watts Regulator Co.; Division of Watts Water Technologies, Inc.
6. Wilkins; Zurn Plumbing Products Group.

B. Minimum Operating-Pressure Rating: 600 psig (1034 kPa).

C. Combination fitting of copper alloy and ferrous materials.

D. Insulating materials suitable for natural gas.

E. Combination fitting of copper alloy and ferrous materials with threaded, brazed-joint, plain, or welded end connections that match piping system materials.

## 2.6 SLEEVES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

## 2.7 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

### 1. Manufacturers:

- a. Advance Products & Systems, Inc.
- b. Calpico Inc.
- c. Metraflex Company (The).
- d. Pipeline Seal and Insulator, Inc.

2. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe and sleeve.

3. Pressure Plates: Stainless steel.

4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one nut and bolt for each sealing element.

## 2.8 LABELING AND IDENTIFYING

- A. Detectable Warning Tape: Acid- and alkali-resistant, PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored yellow.

## PART 3 - EXECUTION

### 3.1 INDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 the International Fuel Gas Code for installation and purging of natural-gas piping.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
- D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- G. Locate valves for easy access.
- H. Install natural-gas piping at uniform grade of 2 percent down toward drip and sediment traps.
- I. Install piping free of sags and bends.
- J. Install fittings for changes in direction and branch connections.
- K. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."
- L. Verify final equipment locations for roughing-in.
- M. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.

- N. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
  - 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches (75 mm) long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
- O. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.
- P. Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.
- Q. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
- R. Connect branch piping from top or side of horizontal piping.
- S. Install unions in pipes NPS 2 (DN 50) and smaller, adjacent to each valve, at final connection to each piece of equipment.
- T. Do not use natural-gas piping as grounding electrode.
- U. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.
- V. Install pressure gage downstream from each line regulator.

### 3.2 VALVE INSTALLATION

- A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing or copper connector.
- B. Install underground valves with valve boxes.
- C. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.
- D. Install earthquake valves aboveground outside buildings according to listing.
- E. Install anode for metallic valves in underground PE piping.

### 3.3 PIPING JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints:

1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
2. Cut threads full and clean using sharp dies.
3. Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.
4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Welded Joints:

1. Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
2. Bevel plain ends of steel pipe.
3. Patch factory-applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.

### 3.4 HANGER AND SUPPORT INSTALLATION

A. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:

1. NPS 1 (DN 25) and Smaller: Maximum span, 96 inches (2438 mm); minimum rod size, 3/8 inch (10 mm).
2. NPS 1-1/4 (DN 32): Maximum span, 108 inches (2743 mm); minimum rod size, 3/8 inch (10 mm).
3. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): Maximum span, 108 inches (2743 mm); minimum rod size, 3/8 inch (10 mm).

B. Install hangers for horizontal, corrugated stainless-steel tubing with the following maximum spacing and minimum rod sizes:

1. NPS 3/8 (DN 10): Maximum span, 48 inches (1220 mm); minimum rod size, 3/8 inch (10 mm).
2. NPS 1/2 (DN 15): Maximum span, 72 inches (1830 mm); minimum rod size, 3/8 inch (10 mm).
3. NPS 3/4 (DN 20) and Larger: Maximum span, 96 inches (2440 mm); minimum rod size, 3/8 inch (10 mm).

### 3.5 CONNECTIONS

- A. Connect to utility's gas main according to utility's procedures and requirements.
- B. Install natural-gas piping electrically continuous, and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
- C. Install piping adjacent to appliances to allow service and maintenance of appliances.

- D. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches (1800 mm) of each gas-fired appliance and equipment. Install union between valve and appliances or equipment.
- E. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.

### 3.6 LABELING AND IDENTIFYING

- A. Comply with requirements in Division 23 Section "Identification for HVAC Piping and Equipment" for piping and valve identification. Install detectable warning tape directly above gas piping, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

### 3.7 FIELD QUALITY CONTROL

- A. Test, inspect, and purge natural gas according to NFPA 54 and authorities having jurisdiction.
- B. Natural-gas piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

### 3.8 INDOOR PIPING SCHEDULE

- A. Aboveground, branch piping NPS 1 (DN 25) and smaller shall be:
  - 1. Steel pipe with malleable-iron fittings and threaded joints.
- B. Aboveground, distribution piping shall be the following:
  - 1. Steel pipe with malleable-iron fittings and threaded joints.
  - 2. Steel pipe 5" and larger with wrought-steel fittings and welded joints.

### 3.9 ABOVEGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

- A. Valves for pipe sizes NPS 2 (DN 50) and smaller at service meter shall be the following:
  - 1. Bronze plug valve.
- B. Distribution piping valves for pipe sizes NPS 2 (DN 50) and smaller shall be the following:
  - 1. Bronze plug valve.
- C. Valves in branch piping for single appliance shall be the following:
  - 1. Bronze plug valve.

END OF SECTION 231123

SECTION 23 31 13

METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rectangular ducts and fittings.
2. Round ducts and fittings.
3. Sheet metal materials.
4. Duct liner.
5. Sealants and gaskets.
6. Hangers and supports.

B. Related Sections:

1. Division 23 Section "Testing, Adjusting, and Balancing of Mechanical Systems" for testing, adjusting, and balancing requirements for metal ducts.
2. Division 23 Section "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.2 PERFORMANCE REQUIREMENTS

- A. Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"
- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Submittals:

1. Documentation indicating that duct systems comply with ASHRAE 62.1-2007, Section 5 - "Systems and Equipment."
2. Documentation indicating that duct systems comply with ASHRAE/IESNA 90.1-2007, Section 6.4.4 - "HVAC System Construction and Insulation."
3. Documentation of work performed for compliance with ASHRAE 62.1-2007, Section 7.2.4 - "Ventilation System Start-Up."
4. For adhesives and sealants, including printed statement of VOC content.

C. Shop Drawings:



1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.
3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
4. Elevation of top of ducts.
5. Dimensions of main duct runs from building grid lines.
6. Fittings.
7. Reinforcement and spacing.
8. Seam and joint construction.
9. Penetrations through fire-rated and other partitions.
10. Equipment installation based on equipment being used on Project.
11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
12. Hangers and supports, including methods for duct and building attachment and vibration isolation.

D. Engineering Submittal:

1. Sheet metal thicknesses.
2. Joint and seam construction and sealing.
3. Reinforcement details and spacing.
4. Materials, fabrication, assembly, and spacing of hangers and supports.

E. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.
2. Suspended ceiling components.
3. Structural members to which duct will be attached.
4. Size and location of initial access modules for acoustical tile.
5. Penetrations of smoke barriers and fire-rated construction.
6. Items penetrating finished ceiling including the following:
  - a. Lighting fixtures.
  - b. Air outlets and inlets.
  - c. Speakers.
  - d. Sprinklers.
  - e. Access panels.
  - f. Perimeter moldings.

F. Welding certificates.

#### 1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum," for aluminum supports.
3. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

- B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2007, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up"
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2007, Section 6.4.4 - "HVAC System Construction and Insulation"

## PART 2 - PRODUCTS

### 2.1 RECTANGULAR DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

### 2.2 ROUND DUCTS AND FITTINGS

- A. All round and /or flat oval ducts shall be factory fabricated spiral duct and fittings. All spiral duct and fittings shall be manufactured by same company who has been in business for at least 3 years. Duct construction shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Lindab Inc.
    - b. McGill AirFlow LLC.
    - c. SEMCO Incorporated.
    - d. Spiral Manufacturing Co., Inc.
- B. Branch connections shall be made with 90° conical and 45° straight taps as shown on the drawings. All branch connections shall be made as a separate fitting. Factory or field installation of taps into spiral duct shall not be allowed without written approval of the Commissioner. Manufacturer's published individual fitting performances shall be on file with the Commissioner.

- C. All elbows shall be fabricated with a centerline radius of 1.5 times the diameter. 90° and 45° elbows in diameters 3" round through 12" round shall be stamped or pleated elbows. All other elbows shall be of the gored type, fabricated in accordance with the following: 2 gores less than 36°, 3 gores for 37° thru 71°F and 5 gores for 72° thru 90°.
- D. Circumferential and longitudinal seams of all fittings shall be a continuous weld or spot welded and sealed with mastic. All welds shall be painted to prevent corrosion.
- E. All field joints for round ducts up to and including 36" diameter and oval ducts up to and including 41" major axis shall be made with a 2" slip-fit or slip coupling. Diameters 38" round and larger shall be provided with AccuFlange, Spiralmate or equal, flanged connections. AccuFlange, or equal, flanged connections may also be used in lieu of slip connections on smaller sizes. Access doors shall be supplied by the duct manufacturer at all fire and/or smoke dampers. All flanges and access doors shall be factory installed. Shipments of loose flanges, access doors, or taps for field installation into spiral duct will not be allowed.
- F. All flat oval duct shall be reinforced with trapeze type reinforcement, as recommended by the manufacturer, to limit wall deflection to 3/4" and reinforcement deflection to 1/4".
- G. Metal gauges for single wall round and flat oval duct shall be as follows:
  - 1. Spiral Duct for positive pressure & negative pressure

Diameter	Galvanized Sheet Steel Metal Gauges			
	+ 4 in wg	+10" wg	- 4 in wg	-10" wg
3" thru 16"	26	26	24	22

- 2. Solid spiral seam inner shall be 24 for duct sizes up to 20 inches and 20 gauge for larger ducts.

2.3 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
  - 1. Galvanized Coating Designation: **G90**
  - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- C. Carbon-Steel Sheets: Comply with ASTM A 1008/A 1008M, with oiled, matte finish for exposed ducts.
- D. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in the "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D, No. 3, or No. 4 as indicated in the "Duct Schedule" Article.
- E. Aluminum Sheets: Comply with ASTM B 209 (ASTM B 209M) Alloy 3003, H14 temper; with mill finish for concealed ducts, and standard, one-side bright finish for duct surfaces exposed to view.

- F. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
  - 1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.
- G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches

## 2.4 DUCT LINER

- A. Liner shall be limited to ductwork indicated on plans.
- B. Fibrous-Glass Duct Liner: Comply with ASTM C 1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. CertainTeed Corporation; Insulation Group.
    - b. Johns Manville.
    - c. Knauf Insulation.
    - d. Owens Corning.
  - 2. Maximum Thermal Conductivity:
    - a. Type I, Flexible: 0.27 Btu x in./h x sq. ft. x deg F at 75 deg F (24 deg C) mean temperature.
    - b. Type II, Rigid: 0.23 Btu x in./h x sq. ft. x deg F at 75 deg F (24 deg C) mean temperature.
  - 3. Antimicrobial Erosion-Resistant Coating: Apply to the surface of the liner that will form the interior surface of the duct to act as a moisture repellent and erosion-resistant coating. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
  - 4. Water-Based Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.
    - a. Use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Insulation Pins and Washers:
  - 1. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, **0.106-inch-** diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.
  - 2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick stainless steel; with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
- D. Shop Application of Duct Liner: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-19, "Flexible Duct Liner Installation."

1. Adhere a single layer of indicated thickness of duct liner with at least 90 percent adhesive coverage at liner contact surface area. Attaining indicated thickness with multiple layers of duct liner is prohibited.
2. Apply adhesive to transverse edges of liner facing upstream that do not receive metal nosing.
3. Butt transverse joints without gaps, and coat joint with adhesive.
4. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted-edge overlapping.
5. Do not apply liner in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and dimensions of standard liner make longitudinal joints necessary.
6. Apply adhesive coating on longitudinal seams in ducts with air velocity of 2500 fpm (12.7 m/s).
7. Secure liner with mechanical fasteners 4 inches (100 mm) from corners and at intervals not exceeding 12 inches (300 mm) transversely; at 3 inches (75 mm) from transverse joints and at intervals not exceeding 18 inches (450 mm) longitudinally.
8. Secure transversely oriented liner edges facing the airstream with metal nosings that have either channel or "Z" profiles or are integrally formed from duct wall. Fabricate edge facings at the following locations:
  - a. Fan discharges.
  - b. Intervals of lined duct preceding unlined duct.
  - c. Upstream edges of transverse joints in ducts where air velocities are higher than 2500 fpm or where indicated.
9. Secure insulation between perforated sheet metal inner duct of same thickness as specified for outer shell. Use mechanical fasteners that maintain inner duct at uniform distance from outer shell without compressing insulation.
  - a. Sheet Metal Inner Duct Perforations: 3/32-inch diameter, with an overall open area of 23 percent.
10. Terminate inner ducts with buildouts attached to fire-damper sleeves, dampers, turning vane assemblies, or other devices. Fabricated buildouts (metal hat sections) or other buildout means are optional; when used, secure buildouts to duct walls with bolts, screws, rivets, or welds.

## 2.5 SEALANT AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- B. Two-Part Tape Sealing System:
  1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
  2. Tape Width: **4 inches**
  3. Sealant: Modified styrene acrylic.
  4. Water resistant.
  5. Mold and mildew resistant.
  6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
  7. Service: Indoor and outdoor.
  8. Service Temperature: Minus 40 to plus 200 deg F

9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
10. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg (2500 Pa), positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.
6. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

F. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg (0.14 L/s per sq. m at 250 Pa) and shall be rated for 10-inch wg (2500-Pa) static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

## 2.6 HANGERS AND SUPPORTS

- A. Hanger Rods for Non-corrosive Environments: Electro galvanized steel rods and nuts.
- B. Hanger Rods for MRI Room: Aluminum rods with stainless steel nuts in MRI rooms within shielded zones.
- C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1 (Table 4-1M), "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct."
- D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

- E. Steel Cables for Stainless-Steel and Aluminum Ducts: Stainless steel complying with ASTM A 492.
- F. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials. Stainless steel screws and fasteners for duct within shielded zone in MRI Rooms
- H. Trapeze and Riser Supports:
  - 1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
  - 2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
  - 3. Supports for Aluminum Ducts: Aluminum or stainless steel

### PART 3 - EXECUTION

#### 3.1 DUCT INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.
- B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- C. Install round ducts in maximum practical lengths.
- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- H. Install ducts with a clearance of 1 inch (25 mm), plus allowance for insulation thickness.
- I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches (38 mm).

- K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Division 23 Section "Air Duct Accessories" for fire and smoke dampers.
- L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

### 3.2 INSTALLATION OF EXPOSED DUCTWORK

- A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.
- B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.
- C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.
- D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.
- E. Repair or replace damaged sections and finished work that does not comply with these requirements.

### 3.3 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
  - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 2. Outdoor, Supply-Air Ducts: Seal Class A.
  - 3. Outdoor, Exhaust Ducts: Seal Class C.
  - 4. Outdoor, Return-Air Ducts: Seal Class C.
  - 5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg (500 Pa) and Lower: Seal Class B.
  - 6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg (500 Pa): Seal Class A.
  - 7. Unconditioned Space, Exhaust Ducts: Seal Class C.
  - 8. Unconditioned Space, Return-Air Ducts: Seal Class B.
  - 9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
  - 10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
  - 11. Conditioned Space, Exhaust Ducts: Seal Class B.
  - 12. Conditioned Space, Return-Air Ducts: Seal Class C.



### 3.4 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
  - 1. Where practical, install concrete inserts before placing concrete.
  - 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
  - 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
  - 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
  - 5. Do not use powder-actuated concrete fasteners for seismic restraints.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1 "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports.
- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

### 3.5 CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Division 23 Section "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

### 3.6 DUCT CLEANINESS

- A. All ductwork openings shall be taped closed with polyethylene when delivered to site. All installed hung ducts openings shall be protected from construction dust. All open end return duct opening shall be protected until ready for use.
- B. Clean the following components by removing surface contaminants and deposits:
  - 1. Air outlets and inlets (registers, grilles, and diffusers).
  - 2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
  - 3. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers

and dehumidifiers, filters and filter sections, and condensate collectors and drains.

4. Coils and related components.
5. Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.
6. Supply-air ducts, dampers, actuators, and turning vanes.
7. Dedicated exhaust and ventilation components and makeup air systems.

- C. Provide temporary MERV 11 construction filters and run continuously for 48 hours to clean system of construction debris or dust.

### 3.7 START UP

- A. Air Balance: Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing of Mechanical Systems."

### 3.8 DUCT SCHEDULE

- A. Supply, Return or Exhaust Ducts:

1. Ducts Connected to Air-Conditioning Units, Return Fans and Exhaust Fans
  - a. Material: Galvanized Steel
  - b. Pressure Class: Positive or negative 2-inch wg.
  - c. Minimum SMACNA Seal Class: A
  - d. SMACNA Leakage Class for Rectangular: 6
  - e. SMACNA Leakage Class for Round and Flat Oval: 6

- B. Intermediate Reinforcement:

1. Galvanized-Steel Ducts: Galvanized steel or carbon steel coated with zinc-chromate primer.
2. Aluminum Ducts: Aluminum.

- C. Liner:

1. Supply and Return: Fibrous glass, Type I, thickness minimum 1 inch unless otherwise noted on plans.
2. Supply and Return Serving Multi-Purpose Room: Fibrous glass, Type I, thickness minimum 2 inch unless otherwise noted on plans.
3. Transfer Ducts: Fibrous glass, Type I, thickness minimum 1-1/2 inch unless otherwise noted on plans.

- D. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Elbows."
  - a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
  - b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.

- c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-3, "Vanes and Vane Runners," and Figure 2-4, "Vane Support in Elbows."
- 2. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-3, "Round Duct Elbows."
  - a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.
    - 1) Radius-to Diameter Ratio: 1.5
  - b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.
  - c. Round Elbows, 14 Inches and Larger in Diameter: Welded.
- E. Branch Configuration:
  - 1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-6, "Branch Connections."
    - a. Rectangular Main to Rectangular Branch: 45-degree entry.
    - b. Rectangular Main to Round Branch: Spin in.
  - 2. Round: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees." Saddle taps are not permitted.
    - a. Velocity 1500 fpm or Lower: Conical tap.
    - b. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION 23 31 13

SECTION 233300

AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Backdraft and pressure relief dampers.
  - 2. Manual volume dampers.
  - 3. Control dampers.
  - 4. Fire dampers.
  - 5. Flange connectors.
  - 6. Turning vanes.
  - 7. Duct-mounted access doors.
  - 8. Flexible connectors.
  - 9. Flexible ducts.
  - 10. Duct accessory hardware.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.
  - 1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
    - a. Special fittings.
    - b. Manual volume damper installations.
    - c. Control damper installations.
    - d. Fire-damper and smoke-damper installations, including sleeves; and duct-mounted access doors.
    - e. Wiring Diagrams: For power, signal, and control wiring.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with AMCA 500-D testing for damper rating.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
  - 1. Galvanized Coating Designation: G90
  - 2. Exposed-Surface Finish: Mill phosphatized.
- C. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and for exposed ducts.
- D. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.
- E. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.
- F. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

## 2.2 BACKDRAFT AND PRESSURE RELIEF DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Air Balance Inc.; a division of Mestek, Inc.
  - 2. American Warming and Ventilating; a division of Mestek, Inc.
  - 3. Duro Dyne Inc.
  - 4. Greenheck Fan Corporation.
  - 5. Nailor Industries Inc.
  - 6. Ruskin Company.
- B. Description: Gravity balanced.
- C. Maximum Air Velocity: 2000 fpm
- D. Maximum System Pressure: 2-inch wg
- E. Frame: 0.052-inch- (1.3-mm-) thick, galvanized sheet steel, with welded corners and mounting flange.
- F. Blades: Multiple single-piece blades, center-pivoted, maximum 6-inch width, 0.025-inch- thick, roll-formed aluminum noncombustible, tear-resistant, neoprene-coated fiberglass with sealed edges.
- G. Blade Action: Parallel.

- H. Blade Seals: Neoprene, mechanically locked.
- I. Blade Axles:
  - 1. Material: Aluminum.
  - 2. Diameter: 0.20 inch
- J. Tie Bars and Brackets: Aluminum
- K. Return Spring: Adjustable tension.
- L. Bearings: Steel ball.
- M. Accessories:
  - 1. Adjustment device to permit setting for varying differential static pressure.
  - 2. Counterweights and spring-assist kits for vertical airflow installations.
  - 3. Electric actuators.
  - 4. Chain pulls.
  - 5. Screen Mounting: Front mounted in sleeve.
    - a. Sleeve Thickness: 20-gage minimum.
    - b. Sleeve Length: 6 inches minimum.
  - 6. Screen Mounting: Rear mounted.
  - 7. Screen Material: Aluminum.
  - 8. Screen Type: Bird
  - 9. 90-degree stops.

### 2.3 MANUAL VOLUME DAMPERS

- A. Standard, Steel, Manual Volume Dampers:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Air Balance Inc.; a division of Mestek, Inc.
    - b. American Warming and Ventilating; a division of Mestek, Inc.
    - c. Nailor Industries Inc.
    - d. Pottorff; a division of PCI Industries, Inc.
    - e. Ruskin Company.
  - 2. Standard leakage rating, with linkage outside airstream.
  - 3. Suitable for horizontal or vertical applications.
  - 4. Frames:
    - a. Hat-shaped, galvanized-steel channels, 0.064-inch (1.62-mm) minimum thickness.
    - b. Mitered and welded corners.
    - c. Flanges for attaching to walls and flangeless frames for installing in ducts.
  - 5. Blades:
    - a. Multiple or single blade.
    - b. Parallel- or opposed-blade design.
    - c. Stiffen damper blades for stability.
    - d. Galvanized steel, 0.064 inch (1.62 mm) thick.
  - 6. Blade Axles: Galvanized steel.
  - 7. Bearings:
    - a. Molded synthetic
    - b. Dampers in ducts with pressure classes of 3-inch wg (750 Pa) or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
  - 8. Tie Bars and Brackets: Galvanized steel.

- B. Standard, Aluminum, Manual Volume Dampers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Air Balance Inc.; a division of Mestek, Inc.
    - b. American Warming and Ventilating; a division of Mestek, Inc.
    - c. Nailor Industries Inc.
    - d. Pottorff; a division of PCI Industries, Inc.
    - e. Ruskin Company.
  2. Standard leakage rating, with linkage outside airstream.
  3. Suitable for horizontal or vertical applications.
  4. Frames: Hat-shaped, 0.10-inch- (2.5-mm-) thick, aluminum sheet channels; frames with flanges for attaching to walls and flangeless frames for installing in ducts.
  5. Blades:
    - a. Multiple or single blade.
    - b. Parallel- or opposed-blade design.
    - c. Stiffen damper blades for stability.
    - d. Roll-Formed Aluminum Blades: 0.10-inch- (2.5-mm-) thick aluminum sheet.
    - e. Extruded-Aluminum Blades: 0.050-inch- (1.2-mm-) thick extruded aluminum.
  6. Blade Axles: Galvanized steel
  7. Bearings:
    - a. Molded synthetic
    - b. Dampers in ducts with pressure classes of 3-inch wg (750 Pa) or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
  8. Tie Bars and Brackets: Aluminum.
- C. Jackshaft:
1. Size: 1-inch (25-mm) diameter.
  2. Material: Galvanized-steel pipe rotating within pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
  3. Length and Number of Mountings: As required to connect linkage of each damper in multiple-damper assembly.
- D. Damper Hardware:
1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch- (2.4-mm-) thick zinc-plated steel, and a 3/4-inch (19-mm) hexagon locking nut.
  2. Include center hole to suit damper operating-rod size.
  3. Include elevated platform for insulated duct mounting.

## 2.4 FIRE DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Air Balance Inc.; a division of Mestek, Inc.
  2. Greenheck Fan Corporation.
  3. Nailor Industries Inc.
  4. Ruskin Company.
- B. Type: Static and dynamic; rated and labeled according to UL 555 by an NRTL.
- C. Closing rating in ducts up to 4-inch wg static pressure class and minimum 4000-fpm velocity.

- D. Fire Rating: 1-1/2 hours.
- E. Frame: Curtain type with blades outside airstream; fabricated with roll-formed, 0.034-inch- (0.85-mm-) thick galvanized steel; with mitered and interlocking corners.
- F. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.
  - 1. Minimum Thickness: 0.052 thick, as indicated, and of length to suit application.
  - 2. Exception: Omit sleeve where damper-frame width permits direct attachment of perimeter mounting angles on each side of wall or floor; thickness of damper frame must comply with sleeve requirements.
- G. Mounting Orientation: Vertical or horizontal as indicated.
- H. Blades: Roll-formed, interlocking, 0.034-inch thick, galvanized sheet steel. In place of interlocking blades, use full-length, 0.034-inch thick, galvanized-steel blade connectors.
- I. Horizontal Dampers: Include blade lock and stainless-steel closure spring.
- J. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.

## 2.5 FLANGE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Ductmate Industries, Inc.
  - 2. Nexus PDQ; Division of Shilco Holdings Inc.
  - 3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Description: Roll-formed, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.
- C. Material: Galvanized steel.
- D. Gage and Shape: Match connecting ductwork.

## 2.6 TURNING VANES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Ductmate Industries, Inc.
  - 2. Duro Dyne Inc.
  - 3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
  - 1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.
- C. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 2-3, "Vanes and Vane Runners," and 2-4, "Vane Support in Elbows."
- D. Vane Construction: Single wall.



## 2.7 DUCT-MOUNTED ACCESS DOORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Warming and Ventilating; a division of Mestek, Inc.
  2. Ductmate Industries, Inc.
  3. Greenheck Fan Corporation.
  4. Nailor Industries Inc.
  5. Pottorff; a division of PCI Industries, Inc.
- B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 2-10, "Duct Access Doors and Panels," and 2-11, "Access Panels - Round Duct."
1. Door:
    - a. Double wall, rectangular.
    - b. Galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class.
    - c. Vision panel, where noted on plans.
    - d. Hinges and Latches: 1-by-1-inch (25-by-25-mm) butt or piano hinge and cam latches.
    - e. Fabricate doors airtight and suitable for duct pressure class.
  2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.
  3. Number of Hinges and Locks:
    - a. Access Doors Less Than 12 Inches (300 mm) Square: No hinges and two sash locks.
    - b. Access Doors up to 18 Inches (460 mm) Square: Two hinges and two sash locks.
    - c. Access Doors Larger Than 24 by 48 Inches (600 by 1200 mm): Four hinges and two compression latches with outside and inside handles.

## 2.8 DUCT ACCESS PANEL ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Ductmate Industries, Inc.
  2. Flame Gard, Inc.
  3. 3M.
- B. Labeled according to UL 1978 by an NRTL.
- C. Panel and Frame: Minimum thickness 0.0528-inch carbon steel.
- D. Fasteners: Carbon steel. Panel fasteners shall not penetrate duct wall.
- E. Gasket: Comply with NFPA 96; grease-tight, high-temperature ceramic fiber, rated for minimum 2000 deg F (1093 deg C).
- F. Minimum Pressure Rating: 10-inch wg (2500 Pa), positive or negative.

## 2.9 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Ductmate Industries, Inc.

2. Duro Dyne Inc.
  3. Ventfabrics, Inc.
  4. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Materials: Flame-retardant or noncombustible fabrics.
- C. Coatings and Adhesives: Comply with UL 181, Class 1.
- D. Metal-Edged Connectors: Factory fabricated with a fabric strip **3-1/2 inches** wide attached to 2 strips of 2-3/4-inch- (70-mm-) wide, 0.028-inch- (0.7-mm-) thick, galvanized sheet steel or 0.032-inch- (0.8-mm-) thick aluminum sheets. Provide metal compatible with connected ducts.
- E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
1. Minimum Weight: 26 oz./sq. yd. (880 g/sq. m).
  2. Tensile Strength: 480 lbf/inch (84 N/mm) in the warp and 360 lbf/inch (63 N/mm) in the filling.
  3. Service Temperature: Minus 40 to plus 200 deg F (Minus 40 to plus 93 deg C).
- F. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.
1. Minimum Weight: 24 oz./sq. yd. (810 g/sq. m).
  2. Minimum Tensile Strength: 500 lbf/inch (88 N/mm) in the warp and 440 lbf/inch (77 N/mm) in the filling.
  3. Service Temperature: Minus 50 to plus 250 deg F (Minus 45 to plus 121 deg C).
- G. Thrust Limits: Combination coil spring and elastomeric insert with spring and insert in compression, and with a load stop. Include rod and angle-iron brackets for attaching to fan discharge and duct.
1. Frame: Steel, fabricated for connection to threaded rods and to allow for a maximum of 30 degrees of angular rod misalignment without binding or reducing isolation efficiency.
  2. Outdoor Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
  3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
  4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
  5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
  6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
  7. Coil Spring: Factory set and field adjustable for a maximum of 1/4-inch (6-mm) movement at start and stop.

## 2.10 FLEXIBLE DUCTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Flexmaster U.S.A., Inc.
  2. McGill AirFlow LLC.
  3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Noninsulated, Flexible Duct: UL 181, Class 1, multiple layers of aluminum laminate supported by helically wound, spring-steel wire.
1. Pressure Rating: 10-inch wg (2500 Pa) positive and 1.0-inch wg (250 Pa) negative.
  2. Maximum Air Velocity: 4000 fpm (20 m/s).

3. Temperature Range: Minus 20 to plus 210 deg F (Minus 29 to plus 99 deg C).
- C. Insulated, Flexible Duct: UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound, spring-steel wire; fibrous-glass insulation; **aluminized** vapor-barrier film.
1. Pressure Rating: 10-inch wg (2500 Pa) positive and 1.0-inch wg (250 Pa) negative.
  2. Maximum Air Velocity: 4000 fpm (20 m/s).
  3. Temperature Range: Minus 20 to plus 210 deg F (Minus 29 to plus 99 deg C).
  4. Insulation R-value: Comply with ASHRAE/IESNA 90.1-2007
- D. Flexible Duct Connectors:
1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches (75 through 460 mm), to suit duct size.

## 2.11 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.
- C. Install backdraft dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.
- D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
1. Install steel volume dampers in steel ducts.
  2. Install aluminum volume dampers in aluminum ducts.
- E. Set dampers to fully open position before testing, adjusting, and balancing.
- F. Install test holes at fan inlets and outlets and elsewhere as indicated.
- G. Install fire dampers according to UL listing.

- H. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
  - 1. On both sides of duct coils.
  - 2. Upstream and downstream from duct filters.
  - 3. At outdoor-air intakes and mixed-air plenums.
  - 4. At drain pans and seals.
  - 5. Downstream from manual volume dampers, control dampers, backdraft dampers, and equipment.
  - 6. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors; and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
  - 7. At each change in direction and at maximum 50-foot (15-m) spacing.
  - 8. Upstream and downstream from turning vanes.
  - 9. Control devices requiring inspection.
  - 10. Elsewhere as indicated.
- I. Install access doors with swing against duct static pressure.
- J. Access Door Sizes:
  - 1. One-Hand or Inspection Access: 8 by 5 inches.
  - 2. Two-Hand Access: 12 by 6 inches.
- K. Label access doors according to Division 23 Section "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.
- L. Install flexible connectors to connect ducts to equipment.
- M. For fans developing static pressures of 4-inch wg (1250 Pa) and more, cover flexible connectors with loaded vinyl sheet held in place with metal straps.
- N. Connect terminal units to supply duct directly or with maximum 8-inch lengths of flexible duct. Do not use flexible ducts to change directions.
- O. Connect diffusers or light troffer boots to ducts directly or with maximum 24-inch lengths of flexible duct clamped or strapped in place.
- P. Connect flexible ducts to metal ducts with draw bands
- Q. Install duct test holes where required for testing and balancing purposes.
- R. Install thrust limits at centerline of thrust, symmetrical on both sides of equipment. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch (6-mm) movement during start and stop of fans.

### 3.2 FIELD QUALITY CONTROL

- A. Tests and Inspections:
  - 1. Operate dampers to verify full range of movement.
  - 2. Inspect locations of access doors and verify that purpose of access door can be performed.
  - 3. Operate fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.
  - 4. Inspect turning vanes for proper and secure installation.

END OF SECTION 233300

SECTION 233416

HVAC FANS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
  - 1. Downblast Centrifugal Exhaust Fan

1.2 SUBMITTALS

- A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
- C. Field quality-control test reports.
- D. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.
- C. UL Standard: Power ventilators shall comply with UL 705.

PART 2 - PRODUCTS

2.1 DOWNBLAST CENTRIFUGAL EXHAUST FAN

- A. General Description:
  - 1. Downblast fan shall be for roof mounted applications
  - 2. Maximum continuous operating temperature is 180 Fahrenheit (82.2 Celsius)
  - 3. Each fan shall bear a permanently affixed manufacture's engraved metal nameplate containing the model number and individual serial number.
- B. Wheel:
  - 1. Constructed of aluminum
  - 2. Non-overloading, backward inclined centrifugal

3. Statically and dynamically balanced in accordance to AMCA Standard 204-05
  4. The wheel cone and fan inlet will be matched and shall have precise running tolerances for maximum performance and operating efficiency.
- C. Motors:
1. AC Induction Motor
    - a. Motor enclosures: Open driproof
    - b. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and furnished at the specific voltage and phase
    - c. Mounted on vibration isolators, out of the airstream
    - d. For motor cooling there shall be fresh air drawn into the motor compartment through an area free of discharge contaminants
    - e. Accessible for maintenance
- D. Housing:
1. Motor cover, shroud, curb cap, and lower windband shall be constructed of heavy gauge aluminum
  2. Shroud shall have an integral rolled bead for extra strength
  3. Shroud shall be drawn from a disc and direct air downward
  4. Lower windband shall have a formed edge for added strength
  5. Motor cover shall be drawn from a disc
  6. All housing components shall have final thicknesses equal to or greater than preformed thickness.
  7. Curb cap shall have pre-punched mounting holes to ensure correct attachment
  8. Rigid internal support structure
  9. Leak proof
- E. Housing Supports and Drive Frame:
1. Drive frame assemblies shall be constructed of heavy gauge steel and mounted on vibration isolators
- F. Vibration Isolation:
1. Rubber isolators
  2. Sized to match the weight of each fan
- G. Disconnect Switches:
1. NEMA rated: 3R
  2. Positive electrical shut-off
  3. Wired from fan motor to junction box installed within motor compartment
- H. Exhaust Damper
1. Provide integral motorized exhaust damper
- I. Accessories:
1. Birdscreen:
    - a. Material Type: Stainless
    - b. Protects fan discharge
  2. Roof Curbs:
    - a. Types: GPS- Welded curb with 45 degree cant and wood nailer
    - b. Mounted onto roof with fan
    - c. Material: Aluminum
    - d. Insulation thickness: 1.5
    - e. Type: Gravity
    - f. Prevents outside air from entering back into the building when fan is off

- g. Balanced for minimal resistance to flow
- h. Galvanized frames with pre-punched mounting holes
- 3. Hinge Kit:
  - a. Aluminum hinges
  - b. Allows the fan to tilt away for access to wheel and ductwork for inspection and cleaning
- 4. Tie-Down Points:
  - a. Four heavy gauge aluminum brackets to secure the fan in heavy wind applications

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install per manufacturer's instructions
- B. Install units with clearances for service and maintenance.
- C. Label units according to requirements specified in Division 23 Section "Identification for HVAC Piping and Equipment."
- D. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Division 23 Section "Air Duct Accessories."
- E. Install ducts adjacent to power ventilators to allow service and maintenance.
- F. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- G. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

#### 3.2 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  - 1. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
  - 2. Verify that cleaning and adjusting are complete.
  - 3. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 233416



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SECTION 233600  
AIR TERMINAL UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Shutoff, single-duct air terminal units.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For air terminal units. Include plans, elevations, sections, details, and attachments to other work.

C. Engineering Submittal:

1. Materials, fabrication, assembly, and spacing of hangers and supports.

D. Field quality-control reports.

E. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."

PART 2 - PRODUCTS

2.1 SHUTOFF, SINGLE-DUCT AIR TERMINAL UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Price Industries.
2. Titus.
3. Nailor Industries Inc.

B. Configuration: Volume-damper assembly inside unit casing with control components inside a protective metal shroud.

- C. Casing: 0.034-inch galvanized steel, single wall.
1. Casing Lining: Adhesive attached, minimum 1-inch thick, polyurethane foam insulation complying with UL 181 erosion requirements, and having a maximum flame-spread index of 25 and a maximum smoke-developed index of 50, for both insulation and adhesive, when tested according to ASTM E 84.
  2. Air Inlet: Round stub connection or S-slip and drive connections for duct attachment.
  3. Air Outlet: S-slip and drive connections, size matching inlet size.
  4. Access: Removable panels for access to parts requiring service, adjustment, or maintenance; with airtight gasket.
  5. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.
- D. Regulator Assembly: System-air-powered bellows section incorporating polypropylene bellows for volume regulation and thermostatic control. Bellows shall operate at temperatures from 0 to 140 deg F shall be impervious to moisture and fungus, shall be suitable for 10-inch wg static pressure, and shall be factory tested for leaks.
- E. Volume Damper: Galvanized steel with peripheral gasket and self-lubricating bearings.
1. Maximum Damper Leakage: ARI 880 rated, 2 percent of nominal airflow at 3-inch wg inlet static pressure.
  2. Damper Position: Normally open
- F. Attenuator Section: 0.034-inch galvanized steel sheet.
1. Lining: Adhesive attached, 3/4-inch thick, polyurethane foam insulation complying with UL 181 erosion requirements, and having a maximum flame-spread index of 25 and a maximum smoke-developed index of 50, for both insulation and adhesive, when tested according to ASTM E 84.
  2. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.
- G. Electric-Resistance Heating Coils: Nickel-chromium heating wire, free of expansion noise and hum, mounted in ceramic inserts in galvanized-steel housing; with primary automatic, and secondary manual, reset thermal cutouts. Terminate elements in stainless-steel, machine-staked terminals secured with stainless-steel hardware.
1. Access door interlocked disconnect switch.
  2. Downstream air temperature sensor with local connection to override discharge-air temperature to not exceed a maximum temperature set point (adjustable.)
  3. Nickel chrome 80/20 heating elements.
  4. Airflow switch for proof of airflow.
  5. Fan interlock contacts.
  6. Fuses in terminal box for overcurrent protection (for coils more than 48 A).
  7. Mercury contactors.
  8. Magnetic contactor for each step of control (for three-phase coils).
- H. Electronic Controls: Bidirectional damper operator and microprocessor-based thermostat with integral airflow transducer and room sensor. Control devices shall be compatible with temperature controls specified in Section 230993 Temperature Control for HVAC and shall have the following features:
1. Damper Actuator: 24 V, powered closed, spring return open

2. Velocity Controller: Factory calibrated and field adjustable to minimum and maximum air volumes; shall maintain constant airflow dictated by thermostat within 5 percent of set point while compensating for inlet static-pressure variations up to 4-inch wg ; and shall have a multipoint velocity sensor at air inlet.
  3. Thermostat: Wall-mounted electronic type with temperature set-point display in Fahrenheit and Celsius.
- I. Direct Digital Controls: Single-package unitary controller and actuator specified in Section 230993 Temperature Control for HVAC.
  - J. Direct Digital Controls: Bidirectional damper operators and microprocessor-based controller and room sensor. Control devices shall be compatible with temperature controls specified in Section 230993 Temperature Control for HVAC and shall have the following features:
    1. Damper Actuator: 24 V, powered closed, spring return open.
    2. Terminal Unit Controller: Pressure-independent, variable-air-volume controller with electronic airflow transducer with multipoint velocity sensor at air inlet, factory calibrated to minimum and maximum air volumes, and having the following features:
      - a. Occupied and unoccupied operating mode.
      - b. Remote reset of airflow or temperature set points.
      - c. Adjusting and monitoring with portable terminal.
      - d. Communication with temperature-control system specified in Section 230993 Temperature Control for HVAC.
    3. Room Sensor: Combination temperature and CO<sub>2</sub> sensor with temperature and CO<sub>2</sub> set-point adjustment and access for connection of portable operator terminal.

## 2.2 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Hanger Rods for Corrosive Environments: Electro-galvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
- C. Steel Cables: Stainless steel complying with ASTM A 492.
- D. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- E. Air Terminal Unit Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- F. Trapeze and Riser Supports: Steel shapes and plates for units with steel casings; aluminum for units with aluminum casings.

## 2.3 SOURCE QUALITY CONTROL

- A. Factory Tests: Test assembled air terminal units according to ARI 880.

1. Label each air terminal unit with plan number, nominal airflow, maximum and minimum factory-set airflows, coil type, and ARI certification seal.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install air terminal units according to NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems."
- B. Install air terminal units level and plumb. Maintain sufficient clearance for normal service and maintenance.
- C. Install wall-mounted thermostats.

#### 3.2 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
  1. Where practical, install concrete inserts before placing concrete.
  2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
  3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes and for slabs more than 4 inches (100 mm) thick.
  4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes and for slabs less than 4 inches (100 mm) thick.
  5. Do not use powder-actuated concrete fasteners for seismic restraints.
- C. Hangers Exposed to View: Threaded rod and angle or channel supports.
- D. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

#### 3.3 CONNECTIONS

- A. Install piping adjacent to air terminal unit to allow service and maintenance.
- B. Hot-Water Piping: Connect heating coils to supply with shutoff valve, strainer, control valve, and union or flange; and to return with balancing valve and union or flange.
- C. Connect ducts to air terminal units according to Section 233113 Metal Ducts.
- D. Make connections to air terminal units with flexible connectors complying with requirements in Section 233300 "Air Duct Accessories."

### 3.4 IDENTIFICATION

- A. Label each air terminal unit with plan number, nominal airflow, and maximum and minimum factory-set airflows. Comply with requirements in Division 23 Section "Identification for HVAC Piping and Equipment" for equipment labels and warning signs and labels.

### 3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
  - 1. **Manufacturer's Field Service:** Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. **Tests and Inspections:**
  - 1. After installing air terminal units and after electrical circuitry has been energized, test for compliance with requirements.
  - 2. **Leak Test:** After installation, fill water coils and test for leaks. Repair leaks and retest until no leaks exist.
  - 3. **Operational Test:** After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
  - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Air terminal unit will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

### 3.6 STARTUP SERVICE

- A. Perform startup service.
  - 1. Complete installation and startup checks according to manufacturer's written instructions.
  - 2. Verify that inlet duct connections are as recommended by air terminal unit manufacturer to achieve proper performance.
  - 3. Verify that controls and control enclosure are accessible.
  - 4. Verify that control connections are complete.
  - 5. Verify that nameplate and identification tag are visible.
  - 6. Verify that controls respond to inputs as specified.

### 3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain air terminal units.

END OF SECTION 233600

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## SECTION 233713

## DIFFUSERS, REGISTERS, AND GRILLES

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Round ceiling diffusers.
2. Supply and return Grilles.

## B. Related Sections:

1. Division 08 Section "Louvers and Vents" for fixed and adjustable louvers and wall vents, whether or not they are connected to ducts.
2. Division 23 Section "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

## 1.2 SUBMITTALS

## A. Product Data: For each type of product indicated, include the following:

1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

## B. Samples: For each exposed product and for each color and texture specified.

## PART 2 - PRODUCTS

## 2.1 CEILING DIFFUSERS

## A. Round Ceiling Diffuser &lt;CG-1&gt;:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - a. Nailor Industries Inc.
  - b. Price Industries.
  - c. Titus.
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: Steel
4. Face Style: Round plaque with aerodynamically shaped, rolled edge, precision die-stamped with integrally drawn inlet round outer cone back pan, plaque not extending greater than ¼ inch beyond outside edge of back pan. The plaque



assembly shall be adjustable for heating and cooling flows and removable using spring lock mechanism.

5. Mounting: Min 1/14 inch neck for duct connection.
6. Dampers: Opposed blade , round neck.
7. Finish: The finish shall be as selected by Architect. The finish shall be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H.
8. Corrosion Resistance: The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering, or deterioration of film.
9. Accessories:
  - a. Equalizing grid.
  - b. Insulated backpan.

## 2.2 REGISTERS AND GRILLES

### A. Adjustable Bar Register <RG-1, SG-1, EG-1>

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - a. Nailor Industries Inc.
  - b. Price Industries.
  - c. Titus.
2. Material: Steel
3. Finish: Baked enamel, color selected by Architect
4. Face Blade Arrangement: Horizontal spaced 3/4 inch apart.
5. Core Construction: Integral
6. Rear-Blade Arrangement: Vertical 3/4 inch apart.
7. Frame: 1 inch wide.
8. Mounting: Countersunk screw, Concealed or Lay in as determined by Architect
9. Damper Type: Adjustable opposed blade.
10. Accessories:
  - a. Rear-blade gang operator.

## 2.3 SOURCE QUALITY CONTROL

- A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in

lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.

- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

### 3.2 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 233713

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## SECTION 234100

## NOISE CONTROL

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Provide noise control systems for equipment, piping and ductwork including:
  - 1. Sound attenuating units.
  - 2. Duct lining
  - 3. Duct and pipe lagging.
  - 4. Ductwork enclosure for soundproofing
  - 5. Soundproofing of construction.
- B. Acoustic performance of equipment systems and air distribution devices:
  - 1. It is the intent of this specification that noise levels from HVAC equipment (air-conditioning and/or ventilating equipment, ducts, grills, diffusers, mixing boxes, fan coil units, pumps, cooling towers, etc.) will not exceed the Noise Criteria Curves (NC) described in Paragraph 3 of this Section. Noise Criteria Curves establish a one number rating for evaluating the acceptability of a sound pressure spectrum according to the average person's hearing. Noise Criteria Curves and their related sound pressure equivalents for each frequency as described in the 1987 ASHRAE Handbook Systems Volume.
  - 2. These NC levels should be used as a guide in the event of product substitutions and shop drawing modifications. The NC levels shall also serve as a gauge by which the results of workmanship and care of installation will be judged from an acoustical standpoint, since a poor installation can lead to the generation of noise.
  - 3. Noise Criteria for occupied spaces for this project shall be NC 30 or better due to mechanical equipment with anticipated 10 dB room noise attenuation.

## 1.3 QUALITY ASSURANCE

- A. Design Criteria:
  - 1. Provide noise control to avoid excessive noise in the building due to the operation of machinery or equipment, or due to interconnected piping, ductwork or conduit.
- B. Acoustical Testing/Quality Assurance:
  - 1. The contractor shall cooperate with regard to sound tests (ARI 575, ANSI S1.13) which may be conducted by the Commissioner to verify that noise criteria are met.
  - 2. The contractor shall notify the Commissioner of any changes which will affect the acoustical performance.

## 1.4 WORKMANSHIP

- A. Workmanship is critical in achieving the objective of noise control and it is critical that all noise control work must be installed in good workmanship like manner.

**PART 2 - PRODUCTS****2.1 SOUND ATTENUATORS**

- A. Galvanized steel casing and inner faces, all internal components shall be spot-welded. Seams shall be lock formed, mastic filled and be airtight.
- B. Filler material shall be of inorganic mineral or glass fiber under a minimum 5% compression. Filler material shall also be inert, vermin and moisture proof. Flame spread classification of 10- 25, fuel contributed 0-15, smoke development 0-20, in accordance with NFPA 255, UL No. 723.
- C. Acoustical performance shall be established by ASTM E-477-96 procedures. Dynamic insertion loss, air generated noise and aerodynamic performance test results, both in positive and negative flow, with pressure drop ratings shall be supplied that meets or exceeds requirements established later in this Specification.
- D. Manufacturers:
  - 1. Industrial Acoustics Company
  - 2. Vibro-Acoustics
  - 3. United McGill Corporation
  - 4. The AeroSonics Corporation

**2.2 SOUND-LININGS**

- A. Acoustical performance shall be established by ASTM C423-90 procedures. Sound Absorption Coefficients with Type "A" mounting per ASTM E795 shall be supplied that meets or exceeds requirements established later in this Specification.
- B. Duct acoustical lining shall be roll form, 1-1/2inch thick roll-form fiberglass insulation with a surface acrylic EPA registered anti-microbial coating that will not support biological growth, and meets ASTM G21 and G22 specifications as called out in the drawings or specifications.
- C. Duct lining shall be adhered by minimum 50% covering of a fire retardant adhesive in combination with non-ferrous mechanical fasteners.
- D. All transverse and longitudinal abutting edges of duct lining shall be sealed and lapped 3" with a heavy coat of adhesive.
- E. Provide metal nosing over transversely-oriented liner edges facing the air stream.
- F. Manufacturers:
  - 1. Owens-Corning Fiberglass Company
  - 2. Johns Manville Insulation Division
  - 3. CertainTeed Corporation

**2.3 DUCT AND PIPE LAGGING**

- A. Acoustical performance shall be established by ASTM E413 and E90 procedures. Insertion loss, Transmission loss and STC data shall be supplied that meets or exceeds requirements established later in this Specification.
- B. Where indicated on the drawings, duct/pipe shall be wrapped with a minimum 2" thick glass or mineral fiber blanket with a minimum 3.0 lb/ft<sup>3</sup> density, and a mass loaded vinyl

sheet covered with an aluminum foil jacket. Complete system shall provide a minimum STC-23 as measured in an independent accredited acoustical laboratory in accordance with ASTM E90 and E413. Insertion Loss data indicating an IL Insertion Loss value of 25 at 500 Hz. shall also be submitted.

C. Manufactures:

1. Kinetics Noise Control, Inc.
2. Childers Products Company
3. Acoustical Duct & Pipe Lag from Sound Seal, a division of United Process, Inc.
4. The Proudfoot Company, Inc.

2.4 SPLIT SEALS

- A. Split Seals consist of pipe halves with minimum 3/4"(20mm) thick neoprene sponge cemented to the inner faces. The seal shall be tightened around the pipe to eliminate clearance between the inner sponge face and the piping. Concrete may be packed around the seal to make it integral with the floor, wall or ceiling if the seal is not in place prior to the construction of the building member. Seals shall project a minimum of 1"(25mm) past either face of the wall. Where temperatures exceed 240°F (115°C), 10 lb. density fiberglass may be used in lieu of the sponge. Basis of design seals shall be Type SWS as manufactured by Mason Industries, Inc. or equal by manufacturers identified above.

PART 3 - EXECUTION

3.1 GENERAL:

- A. No electrical conduit, fixture, ceiling suspension wires or other elements of the building construction shall be attached to or abutted against the duct and piping systems.
- B. Where ducts or piping penetrate walls, ceilings and floors of the occupied spaces, or ceiling void partitions or acoustically rated elements whether shown on the drawings or not, acoustically seal the penetration.
- C. Contain rough-in of piping within stud wall cavities no less than 1/4-inch from the plane of the studs and 1 inch from gypsum board or other wall sheathing.

3.2 SOUND PROOFING OF CONSTRUCTION

- A. Required for penetrations of ductwork, pipes, and conduits through walls, floors and ceilings of mechanical rooms, electrical rooms with transformers, and Sound-Critical Spaces such as the Multi-Purpose Space and Computer Room, as well as those walls, floors, and ceilings indicated on the architectural drawings.
- B. The Contractor shall ensure that the sound control performance of structures be maintained in accordance with the drawings and specifications. All penetrations shall be installed in a manner that results in complete air tightness through structure. If a condition occurs where penetration of the structure by a duct, pipe, conduit, etc., is not shown clearly on the drawings (or described in the specifications), the Contractor shall ask immediately for clarification of the method necessary to install the particular item.
- C. Penetrations of Single-Wythe Masonry and Concrete Constructions
1. Ductwork:

- a. Install a metal sleeve at the penetration. Size the sleeve to allow for 1" Armaflex lining and normal duct clearances. Line the sleeve with 1" thick Armaflex II Sheet Insulation (or equal).
  - b. Install duct through lined sleeve and seal airtight with acoustical sealant or fire-rated acoustical sealant (3M Corporation CP 25 or equal) if partition is fire-rated.
  - c. Do not rigidly secure duct to wall with angles.
2. Pipe/Conduit diameter = 1" or larger:
    - a. Install a metal sleeve at the penetration. Size the sleeve to allow for 1/2" Armaflex lining and normal pipe clearances. Line the sleeve with 1/2" thick Armaflex II Sheet Insulation (or equal). Alternately use acoustic split seals.
    - b. Install pipe/conduit through lined sleeve and seal airtight with acoustical sealant or fire-rated acoustical sealant (3M Corporation CP 25 or equal) if partition is fire-rated.
    - c. Do not rigidly secure pipe/conduit to wall with angles.
    - d. Provide flex connection on one side of seal if crossing acoustic joint.
  3. Pipe/Conduit diameter < 1":
    - a. Wrap pipe/conduit with 1/2" thick Armstrong Self-Seal Armaflex 2000 Pipe Insulation (or equal). Extend wrapping a minimum of 2" beyond the width of the partition on either side.
    - b. Grout tightly to the Armaflex cover on the pipe/conduit.
    - c. Trim Armaflex to the width of the partition, and seal airtight with acoustical sealant or fire-rated acoustical sealant (3M Corporation CP 25 or equal) if partition is fire-rated.
- D. Penetrations of Single Stud Drywall Constructions
1. Ductwork:
    - a. Wrap with 1" thick Armstrong Armaflex II Sheet Insulation (or equal). Extend wrapping a minimum of 2" beyond the width of the partition on either side.
    - b. Install drywall tight to the Armaflex wrap.
    - c. Trim Armaflex to the width of the partition, and seal airtight with acoustical sealant or fire-rated acoustical sealant (3M Corporation CP 25 or equal) if partition is fire-rated.
  2. Pipe diameter = 1" or larger:
    - a. Wrap with 1/2" thick Armstrong Self-Seal Armaflex 2000 Pipe Insulation (or equal). Extend wrapping a minimum of 2" beyond the width of the partition on either side.
    - b. Install a metal pipe sleeve around the Armaflex wrap.
    - c. Install the drywall around the sleeve and spackle tightly to full thickness of partition.
    - d. Trim Armaflex and sleeve to the width of the partition, and seal airtight with acoustical sealant or fire-rated acoustical sealant (3M Corporation CP 25 or equal) if partition is fire-rated.
  3. Pipe diameter < 1":
    - a. Wrap with 1/2" thick Armstrong Self-Seal Armaflex 2000 Pipe Insulation (or equal). Extend wrapping a minimum of 2" beyond the width of the partition on either side.
    - b. Install the drywall tight to the Armaflex wrap.
    - c. Trim Armaflex to the width of the partition, and seal airtight with acoustical sealant or fire-rated acoustical sealant (3M Corporation CP 25 or equal) if partition is fire-rated.
  4. Multiple Duct/Pipe Penetrations
    - a. Where a series of duct, conduits or pipes are penetrating the wall/floor/ceiling, each duct/conduit/pipe shall be separated by minimum 4" in all directions.

- b. Multiple duct/pipe/conduit penetrations at one location (i.e., one large opening for a series of pipe runs) is not recommended.
- 5. Penetrations of Double-Wythe Masonry/Concrete and/or Double Stud Drywall and/or Combination Constructions
  - a. Use same techniques described above EXCEPT do not bridge the two studs or wythes with solid members such as sleeves or stud frames. Each sleeve or frame must be completely separate for each individual wythe or stud.
- 6. Provide flex connections for duct / pipe on one side of seal if crossing acoustic joint.

### 3.3 DUCTWORK ENCLOSURE FOR SOUNDPROOFING

- A. Where indicated on drawings, duct shall be enclosed on all four sides (or air-tight to the slab above) with a separate 2-1/2" steel stud filled with 2" thick, 3 pound density fiberglass and covered with 2 thicknesses of 5/8" thick gypsum wallboard. Wherever possible, joints between the base and face layers shall be staggered by a minimum of 6 inches. All gypsum board joints on both the base and face layers shall be taped. Use acoustical caulking to seal all interfaces with structure. Treatment shall be applied to elbows, transitions, branch-takeoffs, etc. that are included in the applicable duct section.
- B. Where access is required, approved sheetrock covered metal access panels shall be installed with perimeter gaskets.
- C. Where enclosure intersects a metal deck, insure that the gypsum wallboard is cut to the shape of the flutes and caulked air-tight.

### 3.4 SOUND LININGS:

- A. Provide sound linings on all supply and return ductwork within mechanical rooms but not less than 15 ft (25ft) from each fan.
- B. Sound lined boots at return and exhaust registers.
- C. Provide sound linings minimum 10ft downstream of all terminal devices.
- D. Provide 2 inch thick sound linings for all ductwork serving Multi-Purpose Room, Teen Room, Computer Room and where noted on drawings.

### 3.5 SERVICES PENETRATIONS

- A. Pipe and ductwork: Where pipe and ductwork penetrates acoustical partitions, provide acoustic seal around the piping and ductwork.
- B. Electrical Box Sealant: Backs of electrical boxes, light fittings etc., in acoustically rated constructions shall be sealed airtight by sheet caulking.

### 3.6 SILENCER INSTALLATION

- A. Silencer manufacturer's basic installation requirements shall not be compromised.
- B. Where silencers penetrate acoustical partitions, provide acoustic seal around the silencer.



3.7 ELECTRICAL CONNECTIONS:

- A. All isolated equipment to be connected with long lengths of flexible steel conduit from junction box, type depending on environment.

END OF SECTION 234100

## SECTION 237432

## PACKAGED ROOFTOP AC UNIT

## PART 1- GENERAL

## 1.01 SYSTEM DESCRIPTION

- A. Unit is an outdoor rooftop mounted, electrically controlled heating and cooling unit utilizing fully hermetic scroll compressors with on demand crankcase heaters for cooling duty and induced draft gas combustion for heating duty. Unit shall be variable air volume system. Supply air shall be discharged downward as shown on contract drawings. Units shall be of high cooling efficiency and utilize environmentally friendly R-410A refrigerant.
- B. Provide remote wall mount 7-day programmable thermostat and unit controller and indoor space mounted CO2 sensor for demand controlled ventilation.
- C. Provide roof curb with acoustic insulation.

## 1.02 QUALITY ASSURANCE

- A. Unit shall well exceed ASHRAE 90.1-2007 Energy Efficiency Standards. All units shall be ENERGY STAR qualified. EER shall equal or exceed value scheduled on plans
- B. Unit shall be rated in accordance with ARI Standards 210. All units shall be designed in accordance with UL Standard 1995. Unit shall be rated in accordance with ARI sound standards 270 and 370.
- C. Unit shall be certified in accordance with UL Standard 1995/CSA C22.2 No. 236, Safety Standard for Heating and Cooling Equipment.
- D. Unit shall be certified in accordance with ANSI Z21.47b/CSA 2.3b and ANSI Z83.8/CSA 2.6, Safety Standard Gas-Fired Furnaces.
- E. Unit shall be designed to conform to ASHRAE 15, Safety Standard for Mechanical Refrigeration.
- F. Unit shall be UL and UL, Canada, tested and certified in accordance with ANSI Z21.47 Standards as a total package.
- G. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
- H. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
- I. Unit shall be manufactured in a facility registered to ISO 9001:2000.
- J. Each unit shall be subjected to a completely automated run testing on the assembly line.

## 1.03 SUBMITTALS

- A. Product Data: Literature shall be provided that indicates dimensions, operating and shipping weights, capacities, ratings, fan performance, filter information, factory

supplied accessories, electrical characteristics and connection requirements. Installation, Operation and Maintenance manual with startup requirements shall be provided.

- B. Shop Drawings: Unit drawings shall be provided that indicates assembly, unit dimensions, construction details, clearances, and connection details. Computer generated fan curves for each fan shall be submitted with specific design operation point noted. Wiring diagram shall be provided with details for both power and control systems and differentiate between factory installed and field installed wiring.

#### 1.04 DELIVERY, STORAGE, AND HANDLING

- A. Unit shall be shipped with doors bolted shut and outside air hood closed to prevent damage during transport and thereafter while in storage awaiting installation.
- B. Follow Installation, Operation and Maintenance manual instructions for rigging, moving, and unloading the unit at its final location.
- C. Unit shall be stored in a clean, dry place protected from construction traffic in accordance with the Installation, Operation and Maintenance manual.

#### 1.05 WARRANTY

- A. Manufacturer shall provide a "parts only" warranty for a period of 12 months from the date of equipment startup or 18 months from the date of shipment, whichever is less. Warranty shall cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer's written instructions for installation, operation and maintenance have been followed. Warranty excludes parts associated with routine maintenance, such as belts and air filters.

### PART 2- PRODUCTS

#### 2.01 MANUFACTURER

- A. Subject to performance requirements as indicated on plans and as specified herein for the basis of design manufacturer provide by the following manufacturers:
  - 1. AAON (basis of design)
  - 2. Carrier
  - 3. Trane
- B. AAON is the basis of design. All equipment considered for approval shall include at a minimum:
  - 1. R-410A refrigerant
  - 2. Direct drive supply fans
  - 3. Double wall cabinet construction
  - 4. Insulation with a minimum R-value of 13
  - 5. Stainless steel drain pans
  - 6. Hinged access doors with lockable handles
  - 7. Variable capacity compressor with 10-100% capacity
  - 8. Variable frequency drive
  - 9. Modulating gas furnace
  - 10. Factory installed integral unit controls to function as single zone variable air volume system

11. All other provisions of the specifications must be satisfactorily addressed

## 2.02 EQUIPMENT DESCRIPTION

### A. General:

1. The unit shall be a fully factory assembled, pre-tested, single-piece heating and cooling unit. Contained within the unit enclosure shall be compressors, evaporator coils, filters, supply fans, return / exhaust fans, control dampers, air-cooled condenser coils, gas heaters, condenser fans all factory wiring, piping, filters, refrigerant charge (R-410A), unit controls and special features required prior to field start-up. Outdoor sound ratings on shall not exceed 80 dB.
2. Unit shall be factory assembled and tested including leak testing of the coils, pressure testing of the refrigeration circuit, and run testing of the completed unit. Run test report shall be supplied with the unit in the controls compartment's literature pocket.
3. Unit shall have decals and tags to indicate lifting and rigging, service areas and caution areas for safety and to assist service personnel.
4. Unit components shall be labeled, including pipe stub outs, refrigeration system components and electrical and controls components.
5. Estimated sound power levels (dB) shall be shown on the unit ratings sheet.
6. Installation, Operation and Maintenance manual shall be supplied within the unit.
7. Laminated color-coded wiring diagram shall match factory installed wiring and shall be affixed to the interior of the control compartment's access door.
8. Unit nameplate shall be provided in two locations on the unit, affixed to the exterior of the unit and affixed to the interior of the control compartment's access door.

### B. Unit Construction

1. All cabinet walls, access doors, and roof shall be fabricated of double wall, impact resistant, rigid polyurethane foam panels.
2. Unit insulation shall have a minimum thermal resistance R-value of 13. Foam insulation shall have a minimum density of 2 pounds/cubic foot and shall be tested in accordance with ASTM D-1929 for a minimum flash ignition temperature of 610°F.
3. Unit construction shall be double wall with G90 galvanized steel on both sides and a thermal break. Double wall construction with a thermal break prevents moisture accumulation on the insulation, provides a cleanable interior, prevents heat transfer through the panel, and prevents exterior condensation on the panel.
4. Unit shall be designed to reduce air leakage and infiltration through the cabinet. Cabinet leakage shall not exceed 1% of total airflow when tested at 3 times the minimum external static pressure provided in AHRI Standard 340/360. Panel deflection shall not exceed L/240 ratio at 125% of design static pressure, at a maximum 8 inches of positive or negative static pressure, to reduce air leakage. Deflection shall be measured at the midpoint of the panel height and width. Continuous sealing shall be included between panels and between access doors and openings to reduce air leakage. Refrigerant piping and electrical conduit through cabinet panels shall include sealing to reduce air leakage.
5. Roof of the air tunnel shall be sloped to provide complete drainage. Cabinet shall have rain break overhangs above access doors.
6. Access to filters, dampers, cooling coils, reheat coil, heaters, exhaust fans, return fans, energy recovery wheels, compressors, water-cooled condensers, and electrical and controls components shall be through hinged access doors with

quarter turn, zinc cast, lockable handles. Full length stainless steel piano hinges shall be included on the doors.

7. Exterior paint finish shall be capable of withstanding at least 2,500 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with ASTM B 117-95 test procedure.
8. Units with cooling coils shall include double sloped 304 stainless steel drain pans.
9. Unit shall be provided with base discharge and return air openings. All openings through the base pan of the unit shall have upturned flanges of at least 1/2 inch in height around the opening.
10. Unit shall include lifting lugs on the top of the unit.
11. Options:
  - a. Unit base pan shall be provided with 1/2 inch thick foam insulation.
  - b. Unit shall include factory wired control panel compartment LED service lights.
  - c. Unit shall include factory installed, painted galvanized steel condenser coil guards on the face of the condenser coil.

C. Electrical

1. Unit shall be provided with standard power block for connecting power to the unit.
2. Unit shall be provided with factory installed and factory wired, non-fused disconnect switch.
3. Unit shall be provided with factory installed and factory wired 115V, 13 amp GFI outlet with outlet disconnect switch in the unit control panel.
4. Unit shall be provided with phase and brown out protection which shuts down all motors in the unit if the electrical phases are more that 10% out of balance on voltage, the voltage is more that 10% under design voltage, or on phase reversal.

D. Supply Fans

1. Unit shall include direct drive, unhooded, backward curved, plenum supply fans.
2. Blowers and motors shall be dynamically balanced and mounted on rubber isolators.
3. Motors shall be premium efficiency ODP with ball bearings rated for 200,000 hours service with external lubrication points.
4. Variable frequency drives shall be factory wired and mounted in the unit. Fan motors shall be premium efficiency.

E. Exhaust Fans

1. Exhaust dampers shall be sized for 100% relief.
2. Fans and motors shall be dynamically balanced.
3. Motors shall be (premium) efficiency ODP with ball bearings rated for 200,000 hours service with external lubrication points.
4. Access to exhaust fans shall be through double wall, hinged access doors with quarter turn handles.
5. Unit shall include belt driven forward curved exhaust fans.
6. Variable frequency drives shall be factory wired and mounted in the unit. Fan motors shall be premium efficiency.

F. Cooling Coils

1. Evaporator Coils

- a. Coils shall be designed for use with R-410A refrigerant and constructed of copper tubes with aluminum fins mechanically bonded to the tubes and galvanized 304 stainless steel end casings. Fin design shall be sine wave rippled.
- b. Coils shall have interlaced circuitry and shall be 6 row high capacity.
- c. Coils shall be helium leak tested.
- d. Coils shall be furnished with a factory installed thermostatic expansion valves.

#### G. Refrigeration System

1. Unit shall be factory charged with R-410A refrigerant.
2. Compressors shall be scroll type with thermal overload protection, independently circuited, and carry a 5 year non-prorated warranty.
3. Unit shall include a variable capacity scroll compressor on the lead (all) refrigeration circuit(s) which shall be capable of modulation from 10-100% of its capacity.
4. Compressors shall be mounted in an isolated service compartment which can be accessed without affecting unit operation. Lockable hinged compressor access doors shall be fabricated of double wall, rigid polyurethane foam insulated panels to prevent the transmission of noise outside the cabinet.
5. Compressors shall be isolated from the base pan with the compressor manufacturer's recommended rubber vibration isolators, to reduce any transmission of noise from the compressors into the building area.
6. Each refrigeration circuit shall be equipped with thermostatic expansion valve type refrigerant flow control.
7. Each refrigeration circuit shall be equipped with automatic reset low pressure and manual reset high pressure refrigerant safety controls, Schrader type service fittings on both the high pressure and low pressure sides, and factory installed liquid line filter driers.

#### H. Condensers

1. Air-Cooled Condenser
  - a. Condenser fans shall be vertical discharge, axial flow, direct drive fans.
  - b. Coils shall be designed for use with R-410A refrigerant and constructed of copper tubes with aluminum (copper) fins mechanically bonded to the tubes and aluminum end casings. Fin design shall be sine wave rippled.
  - c. Coils shall be designed for a minimum of 10°F of refrigerant sub-cooling.
  - d. Coils shall be helium leak tested.
  - e. Condenser fans shall be high efficiency electrically commutated motor driven with factory installed head pressure control module. Condenser airflow shall continuously modulate based on head pressure and cooling operation shall be allowed down to 35°F with adjustable compressor lockout.

#### I. Gas Heating

1. Natural gas furnace shall be equipped with modulating gas valves, adjustable speed combustion blowers, stainless steel tubular heat exchangers, and electronic controller. Combustion blowers and gas valves shall be capable of modulation. Electronic controller includes a factory wired, field installed supply air temperature sensor. Sensor shall be field installed in the supply air ductwork. Supply air temperature setpoint shall be adjustable on the electronic controller within the controls compartment. Gas heating assemblies shall be capable of operating at any firing rate between 100% and 30% of their rated capacity.

Stainless steel heat exchanger furnace shall carry a 25 year non-prorated warranty.

2. Gas furnace shall consist of stainless steel heat exchangers with multiple concavities, an induced draft blower and an electronic pressure switch to lockout the gas valve until the combustion chamber is purged and combustion airflow is established.
3. Furnace shall include a gas ignition system consisting of an electronic igniter to a pilot system, which will be continuous when the heater is operating, but will shut off the pilot when heating is not required.
4. Unit shall include a single gas connection and have gas supply piping entrances in the unit base for through-the-curb gas piping and in the outside cabinet wall for across the roof gas piping.

J. Filters

1. Unit shall include 4 inch thick, pleated panel filters with an ASHRAE efficiency of 85% and a MERV rating of 13, upstream of the cooling coil. Unit shall also include 2 inch thick, pleated panel pre filters with an ASHRAE efficiency of 30% and MERV rating of 7, upstream of the 4 inch standard filters.
2. Unit shall include a clogged filter switch.

K. Outside Air/Economizer

1. Unit shall include 0-100% economizer consisting of a motor operated outside air damper and return air damper assembly constructed of extruded aluminum, hollow core, airfoil blades with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 15 CFM of leakage per sq. ft. of damper area when subjected to 2 inches w.g. air pressure differential across the damper. Damper leakage rate not to exceed ASHRAE 90.1, 2007 requirements outlined in Table 6.4.3.4.4. Damper assembly shall be controlled by spring return enthalpy activated fully modulating with dual minimum position DDC actuator. Unit shall include outside air opening bird screen, outside air hood with rain lip and barometric relief dampers.
2. Economizer shall be furnished with return air CO2 override.
3. Demand Control Ventilation
  - a. Furnish remote wall mount CO2 sensor and provide demand ventilation control in the unit. CO2 sensor shall be located for each zone.

L. Controls

1. Factory Installed and Factory Provided Controller
  - a. Unit controller shall be capable of controlling all features and options of the unit. Controller shall be factory installed in the unit controls compartment and factory tested.
  - b. Controller shall be capable of standalone operation with unit configuration, set point adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling available without dependence on a building management system.
  - c. The controls shall incorporate dead band of at least 5 deg F within which compressor is locked out or reduced to minimum per ASHRAE 90.1 section 6.4.3.1.2
  - d. The thermostat shall incorporate programming to prevent heating set-point from exceeding the cooling set-point minus any applicable proportional band.
  - e. Controller shall have an onboard clock and calendar functions that allow for occupancy scheduling.

- f. Controller shall include non-volatile memory to retain all programmed values, without the use of an external battery, in the event of a power failure.
  - g. Variable Air Volume System
- 2. Unit shall utilize a variable capacity compressor system and a variable speed fan system to modulate cooling and airflow as required in meeting the VAV demands and to save unit operating energy. Unit fan speed shall modulate based on duct static air pressure sensor.
  - 3. Units with modulating heat (modulating gas furnace) shall be capable of modulating fan speed in both the heating and cooling mode.
  - 4. With modulating hot gas reheat, unit shall modulate cooling and hot gas reheat as efficiently as possible, to meet space humidity loads and prevent supply air temperature swings and overcooling of the space.
- M. Special Features:
- 1. Smoke Detector
    - a. Include supply and return air smoke detector integral to unit hardwired to shut down AC unit on detection of smoke condition. Smoke detector shall have contacts to tie-in with an addressable fire alarm system.

### PART 3- EXECUTION

#### 3.01 INSTALLATION

- A. Provide isolated roof curb for unit rooftop unit installation. Coordinate isolated unit roof curb to match unit support requirements and roof construction type. Refer to architectural and structural plans
- B. Install wall- and duct-mounting sensors, thermostats furnished by manufacturers for field installation. Install control wiring and make final connections to control devices and unit control panel.
- C. Coordinate location of unit thermostat and CO2 sensor with Commissioner. Provide tamper proof enclosures for the thermostat and CO2 sensor.
- D. Coordinate location of remote unit controller with Commissioner and Queens Library Facilities Management.
- E. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- F. Install piping adjacent to machine to allow service and maintenance.
- G. Gas Burner Connections: Coordinate gas piping and connections with Plumbing Contractor for connecting gas piping to burner, full size of gas train inlet, and connect with union, pressure regulator where required, and shutoff valve with sufficient clearance for burner removal and service.
- H. Duct Connections: Duct installation requirements are specified in Division 23 Section "Metal Ducts." Drawings indicate the general arrangement of ducts. Connect supply and return ducts to rooftop replacement-air units with flexible duct connectors. Flexible duct connectors are specified in Division 23 Section "Air Duct Accessories."



- I. Remote wall mounted unit controller shall be located as indicated on plans. Confirm final location with Commissioner prior to installation.
- J. Electrical Connections: Comply with requirements in Division 26 Sections for power wiring, switches, and motor controls.
- K. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

### 3.02 STARTUP SERVICE

- A. Complete installation and startup checks according to manufacturer's written instructions and perform the following:
  1. Inspect for visible damage to furnace combustion chamber.
  2. Inspect for visible damage to compressor, air-cooled outside coil, and fans.
  3. Inspect casing insulation for integrity, moisture content, and adhesion.
  4. Verify that controls are connected and operable.
  5. Clean outside coil and inspect for construction debris.
  6. Clean furnace flue and inspect for construction debris.
  7. Inspect operation of power vents.
  8. Purge gas line.
  9. Verify bearing lubrication.
  10. Inspect fan-wheel rotation for movement in correct direction without vibration and binding.
  11. Adjust fan belts to proper alignment and tension.
  12. Start unit.
  13. Start refrigeration system when outdoor-air temperature is within normal operating limits.
  14. Inspect and record performance of interlocks and protective devices including response to smoke detectors by fan controls and fire alarm.
  15. Operate unit for run-in period.
  16. Perform the following operations for both minimum and maximum firing and adjust burner for peak efficiency:
    - a. Measure gas pressure at manifold.
    - b. Measure combustion-air temperature at inlet to combustion chamber.
    - c. Measure flue-gas temperature at furnace discharge.
    - d. Perform flue-gas analysis. Measure and record flue-gas carbon dioxide and oxygen concentration.
    - e. Measure supply-air temperature and volume when burner is at maximum firing rate and when burner is off. Calculate useful heat to supply air.
  17. Calibrate and program thermostats.
  18. Calibrate and adjust CO2 sensor for demand control ventilation (DCV). Confirm proper operation of DCV.
  19. Adjust and inspect high-temperature limits.
  20. Start refrigeration system and measure and record the following:
    - a. Coil leaving-air, dry- and wet-bulb temperatures.
    - b. Coil entering-air, dry- and wet-bulb temperatures.
    - c. Outdoor-air, dry-bulb temperature.
    - d. Outdoor-air-coil, discharge-air, dry-bulb temperature.

21. Verify operational sequence of controls.
  22. Verify operation of remote panel including pilot-light operation and failure modes. Inspect the following:
    - a. High-limit heat exchanger.
    - b. Alarms.
- B. After startup and performance testing, change filters, verify bearing lubrication, and adjust belt tension.
  - C. Remove and replace components that do not pass tests and inspections and retest as specified above.
  - D. Prepare written report of the results of startup services.

### 3.03 ADJUSTING

- A. Adjust initial temperature and humidity set points.
- B. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

### 3.04 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain rooftop replacement-air units. Refer to DDC General Conditions.

END OF SECTION

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SECTION 238200

ELECTRIC HEATING TERMINAL UNITS

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide labor, materials, equipment and services, and perform operations required for complete installation of the terminal units and related work as indicated on the drawings or specified herein.
- B. Related Work Specified Elsewhere
  - 1. Basic Mechanical Requirements – Section 230500
- C. Work Included: The work shall include, but not be limited to, the following:
  - 1. Architectural Wall Heaters.

1.02 QUALITY ASSURANCE

- A. Material and installation shall comply with the latest edition of application codes, recommended practices, and standards of NEC, NEMA and U.L.

1.03 SUBMITTALS

- A. Submit the following in accordance with the requirements specified under Submittals in Section 23 0500.
  - 1. Product Data
    - a. Submit copies of manufacturer's latest published literature for materials specified herein for approval, and obtain approval before materials are delivered to the site.
    - b. Data shall include manufacturer's specifications for terminal units showing dimensions, capacities, ratings, performance characteristics, gauges and finishes of materials, and installation instructions.
  - 2. Shop Drawings: Shop drawings for work specified herein shall be submitted for approval. Shop drawings shall show assembly-type drawings showing unit dimensions, construction details, and field connection details.
  - 3. Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to terminal units. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of factory-installed and field-installed wiring.
  - 4. Samples: Submit 3 samples for each type of cabinet finish furnished.
  - 5. Maintenance Data: Submit maintenance instructions, including lubrication instructions, filter replacement, motor and drive replacement, and spare parts lists. Include this data, product data, and shop drawings in maintenance manuals in accordance with General Conditions requirements as applicable.

#### 1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and handle as to prevent the inclusion of foreign materials and the damage of breaking, denting and scoring. Do not install damaged terminal units or components; replace with new.
- B. Store materials and equipment where designated. Protect from weather, dirt, fumes, water, construction debris, and physical damage. Contractor shall assume responsibility and security for materials and equipment. Take precautions for protection from detrimental conditions.
- C. Comply with Manufacturer's rigging and installation instructions for unloading terminal units, and moving them to final location.

#### PART 2 - PRODUCTS

##### 2.01 ELECTRIC CABINET HEATER

- A. The electric cabinet unit heaters shall be as manufactured by Qmark, Berko, Air Therm, Trane or approved equal.
- B. Heater Assembly: The heater assembly which fits into the back box shall consist of 0.120" thick, powder coated aluminum die cast part fan panel / panel grille which are mounted all of the operational parts of the heater. The front grille shall be of the louvered type finished in polyester powder coating which resists fading and abrasion.
- C. Heating Elements: The heating elements shall be warranted for five years and shall be of non-glowing design consisting of 80-20 Ni/Cr resistance wire enclosed in a steel sheath to which steel plate fins are brazed. The heating element shall cover the entire air discharge area to ensure uniform heating of all discharge air.
- D. Thermal Limit: The heater shall be equipped with a manual-reset safety limit control that will automatically shut off heater in event of overheating due to any cause. The safety cutouts shall directly interrupt power to the elements. A red warning light will illuminate (visible at top of heater grille) to alert that this control has been activated.
- E. Fan and Motor Assembly: The motor and fan assembly shall be direct drive and mounted on rigid heavy gauge brackets for quiet operation. The fan shall be five-bladed aluminum. The fan motor shall be totally enclosed.
- F. Fan Delay Control: Fan control shall delay fan startup of the fan motor until the heating elements have warmed up. It shall maintain motor operation after heating elements have been de-energized to dissipate residual heat build-up.
- G. Temperature Control: The unit is designed to be controlled electronically with a built-in electronic digital LCD touch screen display mounted on the grille and control board mounted on the fan panel. This control will maintain room temperatures within 1-½ degrees of set point. The output of heat is proportionally controlled as to how much heat is needed to satisfy the set point. Heater automatically adjusts wattage output for optimum comfort. Heater settings can be locked out for security purposes.
- H. Disconnect Switch: This ON/OFF switch shall be mounted on the fan deck to disconnect single point connection to power supply for the internal electrical

- components, including the heating element. It will be completely concealed behind the front grille panel.
- I. Building Management Connection: The unit shall include a unique built-in Building Management System (BMS) connection. This allows the building management system to connect directly to the heater using a dry contact switch (no voltage) to control the heater. A BMS icon is illuminated and all other icons are turned OFF and all buttons are disabled.
  - J. Circuit Breakers – Circuit breakers shall be provided for branch circuit protection on all heaters.
  - K. The Following Factory Installed/Pre-wired Optional Equipment Shall Be Supplied by the Contractor:
    - 1. Manual Reset Thermal Cutout
    - 2. Circuit Breakers
    - 3. 24 Volt Control Supply
    - 4. Dead Front Non Fused Disconnect Switch
    - 5. On-Off Switch
    - 6. Night Set-Back Relay
    - 7. Inlet/Discharge Duct Collars
    - 8. Permanent (Washable) Filter
  - L. The following field installed items shall be supplied by the Contractor:
    - 1. Recess Trim Kit
    - 2. Base Kit

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Examine conditions at the job site where work of this section is to be performed to insure proper arrangement and fit of the work. Start of work implies acceptance of job site conditions.

#### 3.02 PREPARATION

- A. Examine the Contract Drawings and specifications in order to insure the completeness of the work required under this Section.
- B. Verify measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this Section with the work of related trades, so as not to delay job progress.

#### 3.03 INSTALLATION

- A. Installation of Heaters
  - 1. Install heaters as indicated, and in accordance with manufacturer's installation instructions.
  - 2. Locate cabinet heaters as indicated, coordinate with other architect and trades to assure correct recess size for recessed units. Ensure that required clearances are maintained to combustible construction.
  - 3. Install wiring as indicated.

4. Protect units with protective covers during balance of construction.

B. Installation of Panel and baseboard heaters

1. Install heaters as indicated, and in accordance with manufacturer's installation instructions.
2. Locate panel and baseboard heaters as indicated, coordinate location with architect and with other trades. Ensure that required clearance are maintained to combustible construction.
3. Install wiring as indicated.

C. Electrical Wiring

1. Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to Electric Contractor.
2. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division 26 sections. Do not proceed with equipment startup until wiring installation is acceptable to equipment manufacturer.

3.04 ADJUSTING AND CLEANING

- A. After construction is completed, including painting, clean unit exposed surfaces, vacuum clean coils and inside of cabinets. Retouch any marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.

END OF SECTION 238200

SECTION 26 0500  
COMMON WORK RESULTS FOR ELECTRICAL

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

## 1.2 RELATED DOCUMENTS

- A. The General and Supplement Conditions and General Requirements shall apply to the work under this section of the Specifications as if printed herein.
- B. Where General and Supplement Conditions and General Requirements clauses are repeated in these Specifications, it is to call special attention to them, or as a further qualification. No General and Supplement Conditions and/or General Requirements clause referring to the work of this Section shall be considered waived unless specifically stated herein.
- C. Unless otherwise shown on the Contract Drawings, or unless otherwise specified in other Sections of these Specifications, the requirements specified in this Section are applicable to all electrical work of this Contract. Additional requirements applicable to individual Sections of these Specifications are specified in those Sections, or are shown on the Contract Drawings.
- D. The Specifications and Contract Drawings shall formed part of the Contract Documents.

## 1.3 SUMMARY

- A. Provide all labor, materials, supplies, tools, machinery, equipment, scaffolding, transportation, rigging, storage, utilities, supervision and all required permits and licenses necessary to complete the electrical work under this contract. The Contractor shall consult with representative of the utility company to determine the extend of his work regarding the electrical service and their requirements for installation of same. The complete installation shall be in accordance with the requirements of the utility company, electrical code and all other authorities having jurisdiction.
- B. Provide a complete working electrical installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper operation of equipment that is shown or listed, provide the item, which will allow the system to function properly at no increase in Contract Price.
- C. Coordinate the electrical work with the work of the other trades so as to resolve conflicts without impeding job progress or the construction schedule.



- D. Examine all the Contract Documents in order to determine the extent of the Work required to be completed under this Section. Failure to examine all the Contract Documents for this project will not relieve this contractor of the responsibility to perform all the Work required for a complete, fully operational and satisfactory installation.
- E. Provide notice of any concrete work required by this Section that is not indicated on the Structural or Architectural Drawings.

#### 1.4 CODES, STANDARDS, FILING AND PERMITS

- A. The Electrical installation shall comply with the latest revised versions of all applicable laws, rules, regulations, standards, codes and ordinances of the federal, state and local authorities having jurisdiction and other requirements specified in other Specifications and Contract Drawings.
- B. If any of the provisions of the laws, rules, regulations, standards, codes, ordinances and requirements of the Contract Drawings or Specifications are in conflict with one another, the most stringent requirements shall govern.
- C. Nothing in the Contract Drawings or Specifications shall be construed to permit Work not conforming to the applicable laws, ordinances, rules, and regulations. It is not the intent of the Contract Drawings or Specifications to repeat the requirements of codes except where necessary for completeness or clarity. Any modifications required by the above said authorities having jurisdiction shall be made without additional cost to the City of New York. Where Contract Drawings and Specifications requirements are in excess of the rules, regulations and code requirements, and are permitted under the code, the Contract Drawings and Specifications shall govern.
- D. All materials and equipment, materials and methods shall comply with all applicable requirements of laws, codes, ordinances, legislations, etc., of all federal, state and local authorities whether indicated on the contract documents or not.
- E. Obtain the required permits from the local authorities for this work and pay for all fees required by the local, State, and Federal authorities for permits, inspections and review, including special agency construction and operating permits. Make corrections in the work as required by the Commissioner or Inspector to pass local regulations.

#### 1.5 REFERENCES

- A. American with Disabilities Acts (ADA).
- B. American National Standards Institute (ANSI).
- C. Environmental Protection Agency (EPA)
- D. Electrical Industries Association/Telecommunication Industries Association (EIA/TIA)
- E. Factory Mutual (FM)

- F. Federal Aviation Administration (FAA)
- G. Illuminating Engineering Society (IES).
- H. Institute of Electrical and Electronics Engineers (IEEE).
- I. National Electrical Code (NEC-NFPA-70).
- J. National Electrical Manufacturer's Association (NEMA).
- K. National Fire Protection Association (NFPA).
- L. National Electrical Contractors Association (NECA)
- M. National Electrical Testing Association (NETA)
- N. National Uniform Seismic Installation Guidelines (NUSIG)
- O. Local codes, rules and regulations of the City of New York
- P. New York City Building Code
- Q. Underwriters' Laboratories (UL).
- R. Occupational Safety and Health Administration (OSHA)

1.6 WORK INCLUDED

- A. The Work includes but is not limited to the following systems, equipment, and services:
  - 1. All work associated with the new incoming electrical services.
  - 2. Service equipment and Utility Company electric metering provisions.
  - 3. Service equipment distribution panelboard and panelboards for lighting and power.
  - 4. Feeders, subfeeders, and branch circuiting for light, power and control wiring, including connections to all service equipment, panelboards, motor control equipment, disconnect devices, outlets and equipment included in these Specifications or indicated on contract drawings.
  - 5. Furnishing and installation of lighting equipment, lighting fixtures, lamps, contactors, lighting control systems, etc.
  - 6. Installation and testing of lighting equipment and controls.
  - 7. A complete electrical grounding system.
  - 8. Fire Alarm / Life Safety System specified under Section 283100.
  - 9. Testing and Balancing Loads.

10. Installation and wiring of individual motor controllers provided by others.
11. Connection of all motors, equipment, interlocks, safety devices, and other components including all motor controllers.
12. Furnishing and installing all interlock wiring not provided by the Building Automation and Temperature Control (BATC) System
13. Labor and/or standby assistance in commissioning the control and instrumentation systems provided with Building Automation and Temperature Controls Section of the Specification.
14. Wiring and connection to all conveying systems equipment being provided under Division 26.
15. Connection of all equipment furnished under other Divisions and/or by the City of New York.
16. Remove the protective coverings on the lighting fixtures when required by the heating, ventilating and air conditioning air balancing subcontractor.
17. Miscellaneous items as required for complete and functioning systems as specified herein and indicated on the Drawings.
18. Provide all excavation and back-fill required for Division 26 Work.
19. Supports, vibration isolation and seismic restraint devices.
20. Furnish and set all sleeves complete with seals and firestops as specified herein and as required by the Authority having jurisdiction for the passage of conduit, etc. through structural steel, decking, masonry and concrete walls and floors, drywall construction, any other rated construction assembly, and elsewhere as will be required for the proper protection of each raceway and passing through a wall, floor, etc. Coordinate the work with the work of other Trades in order to properly expedite and perform the work. Furnish shop drawings showing the size and location of all required holes through the concrete floors and walls.
21. Participate in and assist in the testing, operation and commissioning of all electrically powered equipment as required during the performance testing and startup of the work of other Sections. Refer to other Sections for additional requirements.
22. Instruments as required for operating and testing the various systems shall be furnished and installed complete as specified herein.
23. Commissioner's personnel shall be fully instructed regarding operation and maintenance of the entire installation and complete printed or typed instruction booklets shall be provided covering maintenance, operation, and adjustment of each piece of equipment. Spare parts lists for each piece of equipment shall be furnished.
24. Provide smoke detector elements in the ductwork in cutouts provided under another Section of the Specifications. Closely coordinate the

installation of all smoke detector elements with the work of the Heating, Ventilating and Air Conditioning Section of the Contract Documents.

- 25. Complete all tests required by all rules, regulations, etc. of all authorities having jurisdiction and prepare, complete and file all forms, tabulations, plans, etc., pertinent thereto with the referenced authorities and accomplish such work with personnel of proper caliber, in particular Professional Engineers, where so required.
- 26. Participate in and provide labor for "off hour" testing of equipment and systems as required by working conditions or by the Authorities Having Jurisdiction to obtain all "Temporary Certificate of Occupancy (TCO)" and final "Certificate of Occupancy"..
- 27. Patching or replace all fireproofing if it is damaged or removed during the installation of the Electrical Work.
- 28. Furnish access doors in general construction.

1.7 SUBMITTALS

- A. Submit detailed and fully coordinated shop drawings showing all conduit routes, equipment with nameplate, devices and pull boxes for each floor including all the Electrical Rooms. The Electrical Rooms shall be shown with large-scale layout shop drawings.
- B. Submit manufacturer's data, shop drawings and samples as noted of all proposed equipment including but not limited to the following:
 

Cable Identification Tags (include sample)	Disconnect switches
Current Transformer Cabinets	Circuit Breakers
Fire Alarm System	Fuses
Wires and Cables (include sample)	Receptacles (include sample)
Lighting Control System	Panelboards
Equipment/Devices Name Plates (include sample)	Conduits
Fireproofing (include sample)	Lamps
Cable Supports(include sample)	Wiring Devices (include sample)
Metering System	Conduit Fittings
Grounding Equipment	Receptacle Plates (include sample)
Floor Boxes and Junction Boxes	
Emergency Lighting System	
Switch plates (include sample)	
Nameplates (include sample)	
- C. Submit detailed and fully coordinated large-scale layout shop drawings showing the sections of all congested areas to show relative position and spacing of the effected elements.
- D. The large-scale layout shop drawings shall be a minimum of 1 / 4 in. equal to 1 ft. scale.

- E. Submit calculations where required by the Specifications or the Contract Drawings.
- F. Submit detail designs for seismic restraint and support for conduits and equipment. The designs shall be certified and sealed by a Professional Engineer licensed in the State in which the work is to be performed.
- G. Submit certified test reports and trip setting of overcurrent and overload devices where required by the Specifications or the Contract Drawings.
- H. All symbols and designations used in preparing Record and Coordination Drawings shall match those used in the Contract Drawings.
- I. Prior to Final Acceptance, the following data shall be furnished to the Commissioner.
  - 1. Record Drawings.
  - 2. Coordination Drawings
  - 3. Operation and Maintenance Manuals
  - 4. Manufacturer's Data of the equipment and devices installed

## 1.8 RELATED SECTIONS

- A. Division 01 – DDC General Conditions

## 1.9 SUBMITTALS

- A. LEED Building Requirements

- 1. General Requirements:
  - a. The City of New York requires the Contractor to implement practices and procedures to meet the project's environmental goals, which include achieving a LEED™ Green Building rating. Specific project goals which may impact this area of work are listed in the applicable paragraphs of this specification section. The Contractor shall ensure that the requirements related to these goals, 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, shall not be allowed if such changes compromise the stated LEED BUILDING criteria.
  - 2. Performance Criteria
    - a. All field applied adhesives, sealants (used as fillers), prime painting, and finished painting shall comply with the low VOC requirements called out in Division 1, Section 01015 - Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, & Architectural Coatings, and Section 09900 - Interior Paint.
    - b. Provide for all field-applied adhesives, sealants (used as fillers), and paints: Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, paints and coatings

applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) limits of products submitted (If an MSDS does not include a product's VOC limits, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer can be submitted in addition to the MSDS to indicate the VOC limits).

#### 1.10 QUALITY ASSURANCE

- A. All workmen performing under this Division shall be skilled workers of the trade involved. Where specialty work, such as splicing or welding are required, submit proof of training, experience and work history for each workman, for review by the Engineer. Only approved workmen shall perform specialty work.
- B. All electrical work shall be performed by an electrical contractor licensed in the state (and the city as required) in which the work is to be performed.
- C. All electrical materials and equipment for which there is a nationally recognized standard shall bear the conformance labeling of the third party inspection authority, such as Underwriters Laboratories Inc., Factory Mutual, ETL or other recognized agency listed, in accordance with the requirements of the City of New York.
- D. Asbestos or items containing asbestos shall not be furnished or installed.
- E. All calculations required by this and other various Sections of these Specifications, or as shown on the Drawings, shall be certified and sealed by a Professional Engineer licensed in the state in which the work is to be performed, and shall be submitted to the Engineer for review.
- F. With the exceptions as specified and/or indicated on the Drawings or in the Specifications, the Contractor shall apply, install, connect, erect, use, clean, commission and condition manufactured articles, materials, and equipment per Manufacturer's current printed instructions and recommendations. Copies of such printed recommendations shall be kept at the Project site and made available as required.
- G. Where the manufacturer's recommendations conflict with the Contract Documents, the conflict shall be brought to the Engineer's attention immediately.

#### 1.11 GUARANTEE

- A. Submit a single guarantee stating that all portions of the work are in accordance with Contract Documents. Warrant all work against faulty and improper material and workmanship for a period of one year from date of substantial completion, except that where guarantees or warranties for longer terms are specified herein, such longer term shall apply. At no additional cost to City of New York, within 24 hours after notification, correct any deficiencies which occur during the warranty period (including all parts, material, labor, etc.), all to the satisfaction of the Commissioner.
- B. During the warranty period, the Contractor shall guarantee the following in a form satisfactory to the Commissioner:
  - 1. All equipment will develop capacities and performance characteristics specified.

2. The systems shall operate without malfunction.
- C. The start of the Contractor's warranty period shall commence on the issue of a "Certificate of Substantial Completion", by the City of New York or the Commissioner for each item of material, equipment, or system.
  - D. The Subcontractor shall confer with the Commissioner concerning the project schedule and determine if there is a need to operate any items of equipment or systems for temporary light, power, heating and/or cooling or other reasons prior to "Substantial Completion". All required extended warranty costs for equipment, materials, and systems shall be included in the Subcontractor's bid.
  - E. Warrant that all components, subsystems and systems will perform their specified functions from the date of turnover and commercial operation through the useful life of the system. In the event components fail for any reason, be responsible to repair, replace and reimburse the City of New York for all costs associated with the component, subsystem or system that failed to perform the specified function.

#### 1.12 SCHEDULING

A. The following is a summary of the scheduling milestones described in the text of the Specifications. The Contractor shall start on or schedule the following upon receiving notice to proceed.

1. Immediately upon award of this Contract, this Contractor, shall have a pre-construction meeting with the Commissioner.
2. As requested by the Commissioner, the Contractor shall submit "Coordination Drawings" to the Commissioner for review.
3. As requested by the Commissioner, the Contractor shall provide a detailed schedule of completion indicating when each system is to be completed and outlining when tests will be performed.
4. Submit proposed test procedures, recording forms and test equipment for review by the Commissioner prior to execution of testing.
5. Submit six (6) final copies of the Operation and Maintenance books to the Commissioner for review.

#### 1.13 VERIFYING EXISTING CONDITIONS

A. Before commencing work, examine all adjoining work on which this work is in any way dependent for perfect workmanship according to the intent of this Specification, and report to Commissioner any condition which prevents performance of first-class work.

#### 1.14 SPACE CONSTRAINT

A. The equipment selections used in the preparation of the Contract Documents will fit into the physical spaces provided and indicated, allowing ample room for access, servicing, removal and replacement of parts, etc. Adequate space shall 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 shall be subject to the Commissioner's review.
- D. Wherever possible, electrical equipment distribution and branch lines shall be installed tight to structure.

#### 1.15 DELIVERY, STORAGE, HANDLING AND PROTECTION

- A. Include all shipping, delivery, hauling, hoisting, shoring, and placement in the building of equipment and materials specified herein. The Contractor shall be responsible for the timely delivery of equipment to the project site as required by the construction schedule. If any item of equipment is received prior to the time it is required, the Contractor shall be responsible for its proper storage and protection until such time as it may be required. The Contractor shall pay for all costs of storage.
- B. If any item of equipment is not delivered to or installed at the Project site in a timely manner as required by the Project construction schedule, the Contractor shall be solely responsible for disassembly, re-assembly, manufacturer's supervision, shoring, general construction modifications, delays, overtime costs, etc. No additional cost or delays shall be incurred by the City of New York.
- C. All other trades' equipment, materials and work shall be protected from damage in areas where electrical work is being carried out. All damage shall be corrected in a manner acceptable to the Commissioner without additional cost to the City of New York.
- D. The Contractor shall be responsible for all work, materials and equipment until finally inspected, tested and accepted; protect work against theft, injury or damage; and carefully store material and equipment received on site which is not immediately installed. All the equipment, materials and the work shall be covered and protected during construction to prevent entry of dust, dirt, obstructing material and to prevent damage due to weather, water, spray-on fireproofing, construction debris, etc., in a manner acceptable to the Commissioner.
- E. All equipment, materials, devices, etc stored off site and delivered to the site must be kept in the manufacturers' original unopened protective packaging with shipping bars, retainers and positioning devices in place until installation. Store all items subject to moisture damage in dry and heated space with factory covering in place.

### PART 2 - - PRODUCTS

#### 2.1 MATERIALS AND EQUIPMENT



- A. Equipment and materials furnished shall be new and unused, prior to this installation, first grade commercial quality and shall be essentially the standard cataloged products of a manufacturer regularly engaged in the manufacture of the products. Only those items specifically shown on the Drawings as existing, relocated or City of New York furnished shall be reused in this installation. Rebuilt or remanufactured equipment will not be permitted.
- B. Since manufacturing methods vary, reasonable minor variations are expected; however, performance and material requirements specified herein are the minimum standards acceptable. The Commissioner retains the sole right to judge the equality of equipment that deviates from the Contract Documents, to reject any alternative submitted by the Contractor, and to require the specified materials and equipment which conform to the requirements of the Contract Documents be furnished.
- C. Equipment and materials that have defects or damage during transportation, installation, or operation is considered as totally damaged. They shall be replaced with the new ones. The materials and equipment which have minor damage may be repaired if written approval is given by the Commissioner. If equipment and materials are approved for repairs, they shall be repaired in a manner acceptable to the Commissioner at no additional cost to the City of New York. The Contractor shall be responsible for all costs associated with the repairs, replacement, including but not limited to, all preparations prior to re-testing, extended warranties, re-commissioning of the equipment, etc.
- D. Where no specific make of material or equipment is mentioned, use any product of reputable manufacturer which conforms to requirements of the project, the associated system and other applicable specification sections as approved by the Commissioner.

## 2.2 IDENTIFICATION

- A. All major components of the electrical distribution system and parts of equipment, such as service equipment, panelboards, safety switches, motor starters, circuit breakers, time clocks, contactors, relays, pull and junction boxes, control boxes/panels, troughs, etc and similar items shall be identified by name, source of power or circuit origin, load served, voltage, number of phases, current rating and frequency. Where equipment or devices, such as transfer switches and relays, are powered from two sources, both normal and emergency shall be identified with the required information.
- B. All major components of the Fire Alarm System, such as Main control panel, data gathering panels, fan shut down control panels, etc, shall be identified by the designations indicated on the contract drawings.
- C. Equipment shall be identified by means of nameplates fastened to the equipment with brass plate screws. Nameplates for the Normal Power Distribution System shall be black surface, white core laminated bakelite with engraved letters. Nameplates for the Fire Alarm System shall be Red surface, white core laminated bakelite with engraved letters.
- D. All nameplates shall be a minimum of 2 in. wide by 4 in. long with engraved white letters 1/4 in. high except for major Fire Alarm System and Electrical Distribution System, such as panelboards, distribution boards, pull boxes, dimming system, etc., a minimum of 3 in wide by 6 in long with one inch high letters shall be used.

- E. Identify each outlet box, junction box, pull box, cabinet, etc for emergency and fire alarm circuitry by red paint. In addition to the red paint, boxes for fire alarm circuitry shall have the black 1 inch "FA" lettering.
- F. Circuits and pull wires shall have tags attached to them at junction boxes, panelboards, pull boxes, relays, support boxes, etc. Tags shall be made of pressure sensitive tape or embossed self-attached ribbon. Feeder or branch circuit numbers and origin and equipment/devices served shall be indicated on the tag. All cables, No. 3 and larger, shall be identified with engraved cable markers indicating the required information. at all pull boxes, support boxes and terminal devices.
- G. Nomenclature shall be according to a schedule approved by the Commissioner. Nameplates and tag symbol shall correspond to the identification on the contract Drawings and on the Record Drawings.
- H. Cardholders and directory cards shall be provided for circuit identification in panelboards. Cardholder shall be located and permanently attached on the inside of panelboard door and shall be plastic frame with clear lexan front. Directory cards shall be typewritten. Circuit descriptions shall include specific floor and unit designations as indicated on floor plans and schedules for all equipment served.

### PART 3 - - EXECUTION

#### 3.1 SEISMIC REQUIREMENT

- A. Seismic restraints for equipment, conduits, devices, luminaries, equipment housekeeping pads and equipment supports shall be provided and shall comply with the latest Seismic and applicable local codes. Refer to the applicable specification sections for other requirements.
- B. Seismic restraint design shall be certified and sealed by a Professional Engineer licensed in the State in which the work is to be performed.

#### 3.2 PENETRATIONS

- A. Avoid, if possible, the penetration of any waterproof membranes such as roofs, machine room floors, basement walls, and the like. If such penetration is necessary, perform it prior to the waterproofing and furnish all sleeves or pitch-pockets required. Advise the Commissioner and obtain written permission before penetrating any waterproof membrane, even where such penetration is shown on the Drawings.
- B. If Contractor penetrates any walls or surfaces after they have been waterproofed, he shall restore the waterproof integrity of that surface as directed by the Commissioner at Contractor's expense.
- C. Pack space between conduits, sleeves, and seal unused sleeves in non-fire rated walls with non-combustible materials.

- D. Conduit enters the building through a concrete foundation wall below grade level, a watertight entrance seal shall be used. The seal shall be by OZ/Gedney, Thomas and Betts, or Appelton.
- E. Make penetrations through floors, walls and any damp-proofed/water-proofed surfaces, damp-proof/waterproof by appropriate means to maintain integrity of system penetrated.
- F. Seal around penetrations and between conduits, sleeves, etc and seal unused sleeves, in fire rated walls with UL listed fireproofing material to maintain integrity fire rating.
- G. The Contractor shall be responsible for the timely placing of sleeves for all piping passing through walls, partitions, beams, floors, and roofs, while the same are under construction.

### 3.3 EXPANSION / DEFLECTION

- A. Equip all conduits, including those embedded in concrete, which cross building expansion or control joints, with expansion fittings.
- B. Where conduits are subjected to expansion and movement in any directions or to vibration transmitted by equipment or vehicular traffic, install a combination expansion and deflection fittings.

### 3.4 SUPPORT

- A. Provide required supports and hangers for conduit and equipment, so that loading will not exceed allowable loadings of structure. Submittal of a bid shall be deemed a representation that such bid has included allowable loadings and has included in estimates the costs associated in furnishing required supports.
- B. The design of the supports for conduits, and equipment shall be certified and sealed by a Professional Engineer licensed in the State in which the work is to be performed.
- C. Where conduits, etc., are routed vertically through shafts, the Contractor shall provide and install all necessary miscellaneous structural members to support the loads imposed by the risers.
- D. Where equipment (transformers, conduit racks, etc.) are supported from structural slabs, the Contractor shall provide all miscellaneous structural members to support the load plus a 250 lb. live load.
- E. The Contractor shall submit Shop Drawings of the riser support system inside vertical shafts to the Commissioner for approval, including details of how the riser support structure is to be attached to the building structure
- F. Miscellaneous structural support members installed in Electrical Room, electric closet, Mechanical Rooms, and where exposed to public view shall be galvanized.
- G. Include supporting frames or racks extending from floor slab to ceiling slab for work indicated as being supported from walls where the walls are incapable of

supporting the weight. In particular, provide such frames or racks in electric closets.

- H. Include supporting frames or racks for equipment, intended for vertical surface mounting, which is required in a freestanding position. Supporting frames or racks shall be of standard angle, standard channel or specialty support system steel members. They shall be rigidly bolted or welded together and adequately braced to form a substantial structure. They shall be firmly secured to the floor slab with expansion anchors designed to support the system and the equipment. Racks shall be of ample size to assure a workmanlike arrangement of all equipment mounted on them and shall not impinge code required work space of other equipment, devices, access panel, junction boxes, pull boxes, etc.
- I. Wall mounted equipment may be directly secured to wall by means of steel bolts. Maintain at least 1" air space between equipment and supporting wall. Groups or arrays of equipment may be mounted on adequately sized steel angles, channels, or bars. Prefabricated steel channels providing a high degree of mounting flexibility, such as those manufactured by Kindorf, Glob-Strutt and Unistrut, may be used for mounting arrays of equipment.
- J. Nothing, including outlet, pull and junction boxes and fittings, shall depend on electric conduits, raceways, or cables for support, except that threaded hub type fittings having a gross volume not in excess of 100 cubic inches may be supported from heavy wall conduit, where the conduit in turn is securely supported from the structure within five inches of the fitting on two opposite sides.
- K. Nothing shall rest on, or depend for support on, suspended ceilings media (tiles, lath, plaster, as well as splines, runners, bars and the like in the plane of the ceiling). If suspended ceilings are used to support lighting fixtures, they shall be designed to support the weight of the fixtures. Branch circuit conduit up to 3/4" may be permitted to be supported from ceiling hanger rods if the allowable loading of the rods is not exceeded and approved by the Commissioner.
- L. For items which are shown as being ceiling mounted at locations where fastening to the building construction element above is not possible, provide suitable auxiliary channel or angle iron bridging, tying to the building structural elements.

### 3.5 DISSIMILAR METALS

- A. Dissimilar metals shall mean those metals which are incompatible with one another in the presence of moisture. Where dissimilar metals come in contact, paint the joint both inside and out with approved coating so as to exclude moisture from the joint, or provide a suitable insulating barrier separating the metals.
- B. Transitions in raceways, from one metal to a dissimilar metal shall only be made at boxes or other enclosures.

### 3.6 CUTTING, PATCHING, SLEEVES

- A. The work shall be carefully laid out in advance. Where cutting, channeling, chasing or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support or anchorage of raceway, outlets or other equipment, the work shall be carefully done and where required, fire rating integrity shall be restored. Any damage to the piping, equipment or defaced finish

plaster, woodwork, metalwork, etc. shall be repaired by skilled mechanics of the trades involved at no additional cost to the City of New York.

- B. The Contractor shall do no cutting, channeling, chasing or drilling of unfinished masonry, tile, floor slab, etc., unless he first obtains permission from the Commissioner. If permission is granted, the Contractor shall perform this work in a manner approved by the Commissioner.
- C. If holes and/or sleeves are not properly installed and cutting and patching becomes necessary, it shall be done at no additional expense to the City of New York. The Contractor shall undertake no cutting or patching without first securing the Commissioner's written approval.
- D. Where other Trades are required to do cutting and patching, furnish to the Commissioner necessary information so that openings for this work can be built into the floors and walls in time. Such cooperation is required to keep cutting of walls and floors to a minimum.
- E. Should Contractor neglect to perform preliminary work, and should cutting be required in order to install equipment, conduits, etc, the expense of this cutting and restoring of surfaces to their original condition shall be borne by this Contractor.

### 3.7 PAINTING

- A. Equipment furnished under this Section shall have factory-applied finish. If the factory finish is damaged during shipment, storage, installation, etc., it shall be repainted by this Contractor subject to the Commissioner's approval. Touch-up painting is acceptable only for minor finish damage.
- B. Provide a heavy field coat of black asphaltum paint on all steel conduits, cradles, vibration isolating mounts, and the like, that will be encased or partially encased in building construction, set in cement or fill, before items are built into the general construction.
- C. Where conduits, mounting channels, outlet, junction, or pull boxes are mounted on a painted surface, or a surface to be painted they shall be painted, by this contractor, to match the surface.

### 3.8 CLEANING UP

- A. Contractor shall take care to avoid accumulation of debris, boxes, crates, etc., resulting from the installation of the work. Contractor shall remove from the premises each day all debris, boxes, etc., and keep the premises clean, subject to the Commissioner's instructions, which shall be promptly carried out.
- B. Contractor shall clean up all luminaires and equipment at the completion of the project.
- C. All electrical equipment including panelboards, wireways, cabinets, enclosures, etc. shall be thoroughly vacuumed clean prior to energizing equipment and at the completion of the project. Equipment shall be opened for observation by the Commissioner as required.

### 3.9 EQUIPMENT PADS AND MOUNTING

- A. Provide concrete pads for all floor mounted equipment.
- B. Contractor shall provide fully dimensioned pad layouts to the General Contractor. Shop Drawings shall be used for dimensional guidance in sizing pads, anchor bolts, locations, etc.
- C. Pads shall be provided for floor-mounted equipment, equipment mounted on legs and/or support stands and they shall conform to the shape of the piece of equipment it serves with a minimum 3 in. margin around the equipment and supports. Pads shall be a minimum of 4 in. high and made of a minimum 28-day, 3000 psi concrete reinforced with 6"x6", 6/6 gauge welded wire mesh. Top and sides of the pad shall be troweled to smooth finishes, equal to those of the floors, with all corners bullnosed to 3 / 4" radius.
- D. Pads shall be dowelled into slab with #4 bars at each corner embedded 3" and grouted with non-shrink grout.
- E. Furnish and install galvanized anchor bolts for all equipment placed on concrete equipment pads, inertia blocks, or on concrete slabs. Bolts shall be the size and number recommended by the Manufacturer of the equipment and as required for seismic restraint. Anchor bolts shall be anchored to the structural floor slab and shall be located by means of suitable templates. When equipment is placed on vibration isolators, the equipment shall be secured to the isolator and the isolator secured to the floor, pad, or supported as recommended by the vibration isolation manufacturer.
- F. Equipment pads for floor standing electrical equipment shall have level mounting channels embedded in the concrete as specified in the applicable sections. Where equipment is mounted on gypsum board partitions, the mounting screws shall pass through the gypsum board and be securely attached to the partition studs or framework.

### 3.10 EQUIPMENT NOISE AND VIBRATION

- A. Equipment and systems, as defined herein, shall be quiet and free of apparent vibration while in operation.
- B. Vibration shall not be apparent to the senses in occupied areas of the building. Both the balancing of rotating machinery and the installation of vibration isolators are required.
- C. Any additional precautions deemed necessary to provide a quiet installation shall be done as part of the Work of this Section, subject to review by the Commissioner and without additional cost to the City of New York. After the systems are in operation, it shall be the responsibility of the Contractor to make any changes to equipment or Work

### 3.11 FINAL ACCEPTANCE TESTS

- A. The entire electrical installation shall be pre-tested, inspected, thoroughly cleaned, and damaged finishes touched up after final completion prior to final acceptance testing being performed. Not less than 30 days prior to the final acceptance testing, furnish the pre-test results and a test plan, to the

- Commissioner for review, outlining all aspects of the testing, including tests to be performed and the expected results.
- B. Provide complete documentation of all component and system tests prior to Commissioner acceptance and turnover of components or systems. In addition, the Commissioner reserves the right to review all test objectives, test plans and test cases, and witness all preoperational tests. Provide the Commissioner with a comprehensive schedule detailing the preparation of testing documentation and the conduct of all component or system tests.
  - C. Perform the following field test in the presence of the Commissioner to demonstrate the reliability of the electrical installation. Give the Commissioner a minimum of one week advance notice of such tests.
  - D. Operate all electrical systems and equipment for a period of 24 hours, unless in the opinion of the Commissioner, a different test period is required, to prove the operation and performance of a system and its equipment.
  - E. Should the foregoing test reveal any defects, promptly correct such defects and re-run the tests until the entire installation conforms to the requirements of these Specifications and the Drawings.
  - F. Tests requiring certified reports and those requiring factory or field inspection shall be conducted and reported to the Commissioner in conformance with standards specified in the applicable sections.
  - G. In addition to the tests outlined above, after completion of the electrical system and prior to occupancy, the following equipment and devices, as a minimum, shall be thermographically inspected.
    - 1. Feeder splices and Connections.
    - 2. Panelboards.
    - 3. All 208 volt (nominal) cable connections rated 100 amperes (#3 AWG) or greater.
    - 4. Other equipment as shown on the Drawings
  - H. The inspection shall be made by an independent inspection company. The inspection shall be made with all equipment, motors, lighting fixtures, and miscellaneous loads operating and with all equipment covers removed.
  - I. Inspection reports complete with color photographs of the infrared scan and control photographs indicating the ambient temperature and any hot spots of each item inspected shall be submitted to the Commissioner for approval. Any equipment, connections or devices indicated to be operating improperly performing equipment shall be replaced or repaired by the Contractor at no cost to the City of New York.
  - J. The date for the final performance acceptance testing shall comply with the Project construction schedule and shall be sufficiently in advance of the Contract completion date to permit the execution of the testing by the Contractor prior to occupancy and the close-out of the Contract. Specific attention is required for any special spaces such as Tenant Areas which will be governed by a separate

construction and turnover schedule from that provided for the overall project. Any adjustments and/or alterations which the final acceptance tests indicate as necessary for the proper and satisfactory functioning of all equipment and systems shall be completed prior to the close-out of the Contract. Re-tests shall not relieve the Contractor of completion date responsibility.

- K. The Contractor shall provide a detailed schedule of completion indicating when each system is to be completed and outlining when tests will be performed. Completion schedule shall be submitted to the Commissioner for review at the time requested by the Commissioner after the notice to proceed has been given by the City of New York. This schedule shall be updated periodically by the Contractor as the Project progresses. Each update shall be submitted to the Commissioner for review.

### 3.12 DEMONSTRATE AND OPERATION INSTRUCTIONS

- A. After completion of all testing, and prior to placing equipment or systems in operation, demonstrate the features and operation of the equipment or systems to the Commissioner, operational and maintenance personnel so that they are familiarized with the equipment and systems, in particularly the following equipment and systems:
  - 1. Panelboards.
  - 2. Revenue metering System
  - 3. Fire alarm and smoke detection systems.
  - 4. Other equipment and control systems shown on the Drawings.
- B. Provide the necessary accessories, test equipment, and personnel, for each demonstration.
- C. Complete all arrangements for the demonstrations through the Commissioner.
- D. Upon the completion of each demonstration or instructional session, obtain "sign-off" from the Commissioner. The "sign-off" shall state that the demonstration or instructions for use were provided, that they were complete and were given to the designated personnel.
- E. The Contractor shall provide the services of a factory trained specialist to supervise the commissioning, startup, and operation of all equipment specified herein and to instruct the Commissioner 's operators during an operating instruction period at or near the Project site. The operating instruction period shall be defined as straight time working hours and shall not include nights, weekends, or travel time to and/or from the Project. See individual sections of these specifications for additional instructions by manufacturer trained specialists.
- F. The Commissioner shall be notified in writing at least two (2) weeks before each operating instruction period begins. The Contractor shall commence no instruction period until the Commissioner has issued his written acceptance of the starting time.

### 3.13 OPERATION AND MAINTENANCE MANUALS

- A. The Contractor shall provide operating instructions and maintenance data books for all equipment and materials furnished under this Section.



- B. Submit six (6) copies of operation and maintenance manuals for review at least ten (10) weeks before Final Review of the Project. Assemble all data in a completely indexed volume or volumes in three-ring binders and identify the size, model, and features indicated for each item. The binders shall have the Project Name and Logo printed on the outside of the binders. These manuals shall be submitted and subjected to the same approval process as detailed for shop drawings and samples as provided in Article 1.18 but shall be returned as "REVIEWED." Submit four (4) copies of the "REVIEWED" operation and maintenance books to the Commissioner upon Project completion.
- C. Operation and Maintenance manuals shall include complete cleaning, and servicing data compiled in clearly and easily understandable form. Data shall show serial numbers and model numbers of each piece or equipment, complete lists of replacement parts (including part numbers), motor ratings, and actual loads.
- D. Include the following information where applicable:
  - 1. Identifying name and mark number.
  - 2. Locations of major equipment (where several similar items are used, provide a list).
  - 3. Complete nameplate data.
  - 4. "Reviewed" submittals as returned to this Contractor.
  - 5. Parts lists.
  - 6. Performance curves and data.
  - 7. Wiring diagrams.
  - 8. Lubrication charts.
  - 9. Manufacturers' recommended operation and maintenance instructions with all non-applicable information deleted.
  - 10. List of spare parts recommended for normal service requirements.
  - 11. Assembly and disassembly instructions with exploded view Drawings where available.
  - 12. Trouble shooting diagnostic instructions where available.

### 3.14 FINAL REVIEW

- A. At a time designated, the entire installation shall be reviewed for compliance with the Contract Drawings and Specifications. The Contractor shall be available at all times during this Review.
- B. The Contractor shall demonstrate prior to the Final Review that all systems and all equipment have been properly adjusted and are in compliance with the requirements of the Contract Documents. After these demonstration tests are completed satisfactorily, but prior to the Final Review field visit, by the

Commissioner the Contractor shall submit to the Commissioner a written certification that 1) attests to Contract Document compliance for this Project, and 2) certifies that the equipment and materials installed in this Project under this Section contain no asbestos or PCB.

- C. Certificates and Documents required herein shall be in order and presented to the Commissioner at least two (2) weeks prior to the Final Review.
- D. After the Final Review, any changes or corrections noted as necessary for the Work to comply with these Specifications and the Drawings shall be accomplished without delay in order to secure final acceptance of the Work.

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SECTION 26 0519

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Building wire and cable, 600V rated and under.
- B. Wiring connectors, splices and connections.

1.3 RELATED SECTIONS

- A. Section 26 0533 – Raceways and Boxes
- B. Section 26 0534 – Boxes and Floor Boxes
- C. Section 26 0553 – Electrical Identification

1.4 SUBMITTALS

- A. Submit under provisions of Section 26 0500, Common Work Results for Electrical.
- B. Product Data: Provide data for each conductor type on:
  - 1. Insulation.
  - 2. Conductor material and dimensions.
  - 3. Splicing method.
- C. Test Reports: Indicate procedures and values obtained.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

1.6 QUALIFICATIONS

- A. Manufacturers shall have a minimum 3 years in the manufacture of this type of wire and cable.

1.7 FIELD SAMPLES

- A. Comply with General Conditions as applicable.
- B. Submit two lengths, each 18 inches of cable assembly from each reel.
- C. Select each length to include complete set of manufacturer markings.
- D. Attach tag indicating cable size and application

1.8 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required

1.9 COORDINATION

- A. Coordinate Work under General Conditions as applicable.
- B. Determine required separation between cable and other work.
- C. Determine cable routing to avoid interference with other work.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Marking: Insulation type, voltage rating, size and listing label shall be printed with permanent white markings repeating along entire length of conductor.

- B. Provide all new wire and cable, manufactured within 12 months of delivery to site and continuously stored where protected from heat and weather.
- C. Conductor packaging and reels: Plainly marked or tagged with Manufacturer's name, AWG, size, voltage rating, insulation type, agency listing and date of manufacture.

2.2 MANUFACTURERS - BUILDING WIRE AND CABLE

- A. Acceptable Manufacturers:
  - 1. AFC
  - 2. National
  - 3. Cablec
  - 4. Or approved equal.

2.3 BUILDING WIRE AND CABLE

- A. Description: Single conductor insulated wire.
- B. Conductor: 98% conductivity copper solid for size 10 AWG and smaller, and stranded for size 8 AWG and larger. All fire alarm wiring shall be solid conductor.
- C. Insulation Voltage Rating: 600 volts.
- D. Insulation: ANSI/NFPA 70, type THHN/THWN, XHHW or THW; NYCEC, 600 Volt type Thw @ 75°C.
- E. Color Coding: All power conductors identified as to phase and voltage by means of color impregnated insulation, as follows:

Voltage	ØA	ØB	ØC	Neutral	Ground
120/208V	Black	Red	Blue	White	Green

For wire sizes No. 8 AWG and larger, color banding tape, minimum 2 inches wide, may be used at all accessible locations in lieu of colored insulation.

2.4 MANUFACTURERS - CONTROL CABLE

- A. Acceptable Manufacturers: Alpha, Belden or equal.
- B. Or approved equal.

2.5 MULTI-CONDUCTOR CONTROL CABLE

- A. Description: Multi-conductor insulated cable with color-coded PVC insulation over each conductor and an overall PVC jacket.
- B. Conductor: Copper, stranded.
- C. Insulation Voltage Rating: 600V.
- D. Temperature Rating: -20 degrees C to +80 degrees C.
- E. Agency Certification: UL recognized, passes VW-1 flame test.

## 2.6 WIRING CONNECTORS

- A. Split Bolt Connectors:
  - 1. Burndy, "Servit" K series
  - 2. Thomas & Betts "Locktite" T series
  - 3. Or approved equal.
- B. Spring Wire Connectors:
  - 1. 3M "Ranger"
  - 2. Ideal "Wingnut"
  - 3. Or approved equal.
- C. Compression Connectors:
  - 1. Burndy "Hylink" YS Series
  - 2. Thomas & Betts "Color-Keyed" 54500 Series
  - 3. Or approved equal.

## 2.7 INSULATION

- A. Insulating Tape:
  - 1. 3M "Scotch" #33
  - 2. Manville "Bulldog" #166
  - 3. Or approved equal.
- B. Heat-Shrink Tubing:

1. Raychem
2. General Electric
3. Or approved equal.

## 2.8 ACCESSORIES

- A. Vertical Cable Supports:
  1. O-Z/Gedney, Type "M"
  2. Adalet, "SVM" series
  3. Or approved equal.
- B. Conductor Ties:
  1. Panduit, "Pan-ty"
  2. Thomas & Betts, "Ty-rap"
  3. Or approved equal.
- C. Conductor Sealant:
  1. Dow-Corning, #795 silicone
  2. General Electric, #SCS1000 silicone
  3. Or approved equal.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that mechanical work likely to damage wire and cable has been completed.

### 3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.
- B. Deliver all conductors to the site on their original cable reels or in their original unbroken packages.



### 3.3 APPLICATION

- A. Install all conductors used for power in conduit or approved raceway systems. Install all conductors for fire alarm system in conduit.
- B. Install conductors used for low voltage control systems in conduit or approved raceway systems, unless conductors used have specific agency listing for direct installation in ceiling plenums.
- C. Install all exposed conductors and conductors concealed in walls in conduit or approved raceway systems.
- D. In dry interior locations, use type THHN/THWN
- E. In wet or damp interior locations, use type THWN, XHHW.
- F. In exterior locations, including underground installations, use type THWN or XHHW.
- G. Make wire connections on conductors #10 AWG and smaller with spring wire connectors.
- H. Make wire connections and splices on conductors #8AWG and larger with solderless pressure connectors, compression connectors or split-bolt connectors. Hard insulated Bakelite or ceramic connectors are prohibited.
- I. Tape all connections made with non-insulated type connectors with insulating tape to 150 percent of the insulating value of the conductor insulation.
- J. Seal around conductors with silicone sealant where conduit passes through exterior walls.
- K. Tag all conductors in junction boxes, pull boxes and wireways, indicating panelboard and circuit number.

### 3.4 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Use conductor not smaller than 12 AWG for power and lighting circuits.
- C. Use conductor not smaller than 16 AWG for control circuits.
- D. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet to first outlet.
- E. Pull all conductors into raceway at same time.
- F. Use suitable wire pulling lubricant for building wire 4 AWG and larger.

3.5 INTERFACE WITH OTHER PRODUCTS

- A. Identify wire and cable under provisions of Section 26 0553.
- B. At each junction or pullbox, identify each conductor with its circuit number or other designation indicated on Drawings.

3.6 FIELD QUALITY CONTROL

- A. Perform field inspection and testing with General Conditions as applicable.
- B. Inspect wire and cable for physical damage and proper connection.
- C. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
- D. Verify continuity of each branch circuit conductor.

END OF SECTION 26 0519

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SECTION 26 0526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 WORK INCLUDED

- A. Power system grounding.
- B. Electrical equipment and raceway grounding and bonding.

1.3 SYSTEM DESCRIPTION

- A. Ground the electrical service system neutral at service entrance equipment to main cold water service and to grounding ring grounding electrodes. Provide grounding system for emergency/standby generator separately derived system as required.
- B. Provide communications system grounding conductor at main grounding bar.
- C. Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, and plumbing systems.

1.4 REFERENCES

- A. NYCEC – New York City Electrical Code

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Grounding system components shall be as required to comply with the design and construction of the system indicated. Components shall be as indicated in manufacturer's submittal data.
- B. Ground conductors shall be stranded tinned, annealed copper cable in RMC conduit for #6 AWG or larger. Bond both ends of metallic conduit.
- C. Grounding clips shall be Steel City Type G, or equal.
- D. Ground Rods shall be copper-encased steel, 3/4" diameter, minimum length 10 feet.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install ground system as indicated, in accordance with the applicable requirements of the NYCEC and the National Electrical Contractors Association's "Standard of Installation".
- B. Install grounding conductors continuous, without splice or connection, between equipment and grounding electrodes.
- C. In feeder and branch circuits, provide a separate, insulated equipment grounding conductor. Terminate each end on a grounding lug, bus, or bushing.
- D. Connect grounding electrode conductors to metal water pipe using suitable ground clamp. Make connections to flanged piping at street side of flange. Provide bonding jumper around water meter.
- E. Install Fusion Welded ground connectors where they are concealed or inaccessible.
- F. Ground each outlet by the use of an approved grounding clip attached to the junction box in such a position to be readily inspected on removal of the cover plate; or by the use of an approved grounding yoke type receptacle.
- G. No strap grounding clamps shall be used, connections requiring bolting shall be made up with Monel metal bolts, washers and nuts. Connections shall be made only after surfaces have been cleaned, or ground to expose virgin metal.
- H. Install external ground wire on liquid tight flexible metal conduit with grounding bushings.
- I. Conductor connections shall be made by means of solderless connectors such as serrated bolted clamps or split bolt and nut type connectors.
- J. The neutral of each transformer shall be bonded to system ground at one point only. This point shall be ahead of the first secondary protective device.
- K. Provide grounding well pipe with cover at each rod location. Install well pipe top flush with finished grade.
- L. Bond together metal siding not attached to grounded structure, bond to ground.
- M. Bond together reinforcing steel and metal accessories in fountain structures.
- N. Provide 8 inch x 1 inch x ¼ inch thick copper ground bus by each telecom backboard.

### 3.2 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

- B. Measure ground resistance from system neutral connection at service entrance to convenient ground reference point using suitable ground testing equipment. Resistance shall not exceed 10 ohms.

END OF SECTION 26 0526

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SECTION 26 0529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Conduit supports.
- B. Equipment supports.
- C. Equipment anchoring and supports.
- D. Fastening hardware.

1.3 RELATED WORK

- A. Common Work Results for Electrical as applicable
- B. Section 03 3000 Cast-in-Place Concrete. Concrete equipment pads.
- C. Section 23 0529 – Supports and Anchors.
- D. Section 26 0533 – Raceways and Boxes.

1.4 COORDINATION

- A. Coordinate size, shape and location of concrete pads with Section 03 300.

1.5 QUALITY ASSURANCE

- A. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry. Support materials shall be heavy duty malleable iron or steel, and in damp or moist locations corrosion resistant steel.

1.6 ENGINEERING RESPONSIBILITY

- A. Provide support and anchorage system in accordance with procedures in Common Work Results for Electrical as applicable. Support and bracing of conduits shall be per OSHPD pre-approved system indicated in paragraph 2.07.



## 1.7 SUBMITTALS

- A. Submit product data, current OSHPD pre-approval number and shop drawings under Common Work Results for Electrical as applicable.
- B. Submit layout drawings, details, locations and structural calculations for support systems. Calculations shall be prepared and signed by a licensed professional Structural Engineer.

## PART 2 - PRODUCTS

### 2.1 CONCRETE FASTENERS

- A. Drilled wedge expansion type concrete anchors, Phillips "Red-Head" WS series, Ramset "Trubolt" or approved equal.
- B. Provide powder driven concrete fasteners with washers by Remington, Ramset, or equal.
- C. Drilled sleeve type expansion anchors, Ramset "Dynabolt," Phillips "Red-Head" RM series or approved equal.

### 2.2 CONDUIT STRAPS

- A. Hot-dip galvanized, cast malleable iron, one hole type strap with cast clamp-backs and spacers as required.
- B. OZ/Gedney "14-G" series strap and "141G" series spacer; Efcor "231" series strap and "131" series spacer; Thomas & Betts "1276" series strap and "1350" series spacer, or approved equal.

### 2.3 CONCRETE INSERTS

- A. Pressed galvanized steel, spot insert, with oval slot capable of accepting support nuts of 1/4-inch to 1/2-inch diameter thread.
- B. Unistrut No. M24 with "M2506" series nut; Superstrut No. 425 with "AB-102" series nut, Kinline No. 279 with "660" series nut, or approved equal.

### 2.4 CONSTRUCTION CHANNEL

- A. 1-1/2 inch by 1-1/2 inch, 12-gauge galvanized steel channel with 9/16-inch diameter bolt holes, 1-7/8 inch on center, in the base of the channel.
- B. Superstrut A-1200-P, Unistrut P-1000-HS, Kinline 4112-PO, or approved equal.

### 2.5 THREADED ROD

- A. Galvanized rod, sized for the load unless otherwise shown or specified.

## 2.6 CABLE TIES AND CLAMPS

- A. Thomas and Betts Co. "Ty-Raps," Panduit "Pan-ty" or approved equal, one piece, nylon, reusable tape lashing ties.

## 2.7 DRYWALL MOUNTING BRACKET

- A. Use drywall bracket type MPLS by Caddy Fasteners for low voltage, Class 2 systems (TV antenna, phone jacks, sound systems) unless otherwise noted on drawings.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Provide supporting devices as noted in other Sections of Division 26.
- B. Fasten hanger rods, conduit clamps, outlet and junction boxes to building structure using precast inserts, expansion anchors, preset inserts or beam clamps.
- C. Use hollow wall fasteners in hollow masonry walls.
- D. Use expansion anchors or preset inserts in solid masonry walls.
- E. Use self-drilling anchors or expansion anchors on concrete surfaces.
- F. Powder activated anchors may only be used if first accepted in writing by the Commissioner.
- G. Use sheet metal screws in sheet metal studs and wood screws in wood construction.
- H. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.
- I. Do not drill structural steel members without written approval by the Commissioner.
- J. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.
- K. Install surface-mounted cabinets and panelboards with a minimum of four anchors. Provide additional support backing in stud walls prior to sheet rocking as required to adequately support cabinets and panels.
- L. Bridge studs top and bottom with channels to support flush-mounted cabinets and panelboards in stud walls.
- M. Anchor free-standing equipment on concrete pads where indicated.

- N. Surface outlet junction and pull boxes shall be fastened to building structure and independent of conduit supports.
- O. Conduits above suspended ceiling shall be supported by straps or hangers attached to the building structure and independent of the ceiling suspension system.

3.2 LAYOUT

- A. Layout support devices to maintain headroom, neat mechanical appearance and to support equipment loads.

END OF SECTION 26 0529

SECTION 26 0533  
RACEWAYS AND BOXES

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

## 1.2 SUMMARY

- A. Section includes conduit and tubing, surface raceways and wireways.
- B. Raceway shall be non-flexible type, except where flexible metal conduits are specifically permitted. Use of surface metal raceway is only permitted in areas indicated on contract drawings.
- C. Conduit shall not be embedded or encased in the concrete slabs except specifically where permitted on the Contract Drawings.

## 1.3 RELATED WORK

- A. Section 26 0500 – Common Work Results for Electrical

## 1.4 REFERENCES

- A. All conduit and all components shall be designed, manufactured, and tested in accordance with the latest applicable industry standards and codes including the following
1. ANSI C80.1 - Rigid Steel Conduit, Zinc-Coated.
  2. ANSI C80.3 - Electrical Metallic Tubing, Zinc-Coated.
  3. ANSI C80.5 - Rigid Aluminum Conduit.
  4. NECA – Standard of Installation
  5. NEMA FB 1 – Fittings, Cast Metal Boxes and Conduit Bodies for Conduit and Cable Assemblies.
  6. NFPA 70 - National Electrical Code (NEC).
  7. UL Std. 1 - Flexible Metal Conduit
  8. UL Std. 5 - Surface Metal Raceways and Fittings

9. UL Std. 6 - Rigid Galvanized Conduit
10. UL 360 - Electrical Liquid-tight Flexible Steel Conduit
11. UL Std. 467 - Electrical Grounding and Bonding
12. UL 514B - Fittings for Conduit and Outlet Boxes
13. UL 797 - Electrical Metallic Tubing
14. UL 870 - Wireways, Auxiliary Gutters, and Associated Fittings
15. UL 884 - Underfloor Raceways and Fittings

#### 1.5 SUBMITTALS

- A. Submit the Shop Drawings indicating where each type of system will be used.
- B. Submit Catalog sheets with manufacturer's data.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver material in manufacturer's original, unopened, protective packaging.
- B. Store materials in a clean, dry space and protect them from weather. Protect conduit from corrosion and entrance of debris by storing above grade.
- C. Handle in a manner to prevent damage to finished surfaces.

### PART 2 – PRODUCTS

#### 2.1 GENERAL

- A. Sizes of raceways are shown on the Contract Drawings.
- B. Minimum size of conduit shall be 3/4 inch.
- C. Conduit shall be supplied in standard 10-foot lengths.
- D. PVC conduit for interior electrical installation is prohibited.

#### 2.2 RIGID METAL CONDUIT AND FITTINGS

- A. Rigid Steel Conduit: Full weight, threaded, hot-dip galvanized, inside enameled, conforming to UL Std. 6 and ANSI C80.1.
- B. PVC Externally Coated Conduit: Conform to NEMA RN 1; rigid steel conduit with external 40 mil PVC coating and internal galvanized surface.

- C. Fittings and Conduit Bodies: Conform to UL Std. 514B and NEMA FB 1; threaded type, material to match conduit. Grounding insulated bushings shall be rated 150 degrees C.
- D. Acceptable manufacturers:
  - 1. Allied Tube and Conduit
  - 2. Steel City
  - 3. Wheatland Tube Co.
  - 4. Or Approved Equal

2.3 ELECTRICAL METALLIC TUBING (EMT) AND FITTINGS

- A. Thin-Wall Conduit: Formed of cold rolled strip steel, electrical resistance welded, hot dip galvanized, conforming to UL Std. 797 and ANSI C80.3.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; concrete tight, Steel compression connector. Grounding insulated bushings shall be rated 150 degrees C.
- C. Acceptable manufacturers:
  - 1. Allied Tube and Conduit
  - 2. Steel City
  - 3. Wheatland Tube Co.
  - 4. Or Approved Equal

2.4 FLEXIBLE METAL CONDUIT AND FITTINGS

- A. Conduit: Fabricated in continuous length from galvanized steel strip, spirally wound and formed to provide an interlocking design. Conform to UL Std.1.
- B. Fittings: Conform to UL Std. 514B and NEMA FB 1, Steel or malleable iron with insulated throat.
- C. Acceptable manufacturers:
  - 1. AFC
  - 2. Alflec\Commonwealth Industries Inc.
  - 3. Hubbell
  - 4. Or Approved Equal

2.5 LIQUIDTIGHT FLEXIBLE CONDUIT AND FITTINGS

- A. Conduit: Flexible metal conduit with grey PVC jacket. Conform to UL Std. 360
- B. Fittings: Liquid tight type and Conform to UL Std. 514B and NEMA FB 1, steel or malleable iron with nylon insulated throat.
- C. Acceptable manufacturers:
  - 1. Alflex\Commonwealth Industries Inc.
  - 2. AFC
  - 3. Appelton Electric
  - 4. Or Approved Equal

2.6 SURFACE RACEWAYS WITH MULTI-OUTLET ASSEMBLY

- A. Raceway and fittings shall be manufactured of steel and UL listed. Raceway shall be a two-piece design with a metal base and a snap on metal cover.
- B. Finish: To be approved by Commissioner
- C. Size: As indicated on drawings
- D. Wiring devices: Nema 5-15R, Isolated ground 5-15R,
- E. Spacing: 12" OC
- F. Acceptable manufacturer:
  - 1. Wiremold
  - 2. Hubbel
  - 3. Thomas & Betts
  - 4. Or Approved Equal

2.7 PLASTIC CONDUIT AND FITTINGS

- A. Conduit: Rigid Polyvinyl Chloride conduit, Schedule 40, conforming to NEMA TC 2 and listed for exposed and direct burial applications.
- B. Fittings and Conduit Bodies: Conform to NEMA TC 3.
- C. Acceptable manufacturers:
  - 1. Carlon
  - 2. Cantex Inc.
  - 3. ArnCo Corp.

4. Or Approved Equal

## 2.8 EXPANSION/DEFLECTION FITTINGS

- A. Fittings: Hot-dip Galvanized parts. Conform to UL Std. 514B and NEMA FB-1
- B. Bonding jumper: Braided tinned copper, hot dip galvanized clamps and U-bolts.
- C. Acceptable Manufacturers:
  1. Allied Tube and Conduit
  2. Steel City
  3. Wheatland Tube Co.
  4. Or Approved Equal

## 2.9 THROUGHWALL AND FLOOR SEALS

- A. Fittings shall be hot dip galvanized steel.
- B. Oversize sleeves
- C. Neoprene sealing grommets and waterproofing membrane clamp adapters
- D. Acceptable Manufacturers
  1. OZ/ Gedney – Type FSK/FSKA
  2. LinkSeal
  3. Or Approved Equal

## PART 3 - EXECUTION

### 3.1 INSTALLATION

#### A. GENERAL

1. Worked into complete, integrated arrangement with like elements to make Work neat appearing, finished.
2. Run concealed in finished portions of the building, except in electrical, mechanical and telecommunication equipment rooms or noted otherwise. Where exposed, install parallel with walls or structural elements: vertical runs plumb; horizontal runs level or parallel with structure as appropriate.
3. Group conduits together neatly with straight runs and bends both parallel and uniformly spaced and provide space for 25 percent additional conduit on racks..



4. Conduit shall not be embedded in concrete slabs except specifically where permit in Contract Drawings. If embedded conduits specifically noted on the Drawings, all the fittings shall be watertight type and installation of these conduits shall be approved by the Commissioner.
5. Termination of the conduits to all equipment, cabinets, pull boxes, junction boxes, etc, shall be terminated with insulating bushings, locknuts, insulating throat connectors, etc,. Conduit larger than 1 inch trade size terminating in cabinets, panel boxes, pull boxes and not containing a separate insulated ground conductor shall be provided with insulated grounding bushings.
6. All cut ends and joints shall be cut square, reamed smooth, and drawn-up tight.
7. Install as high as practicable to maintain adequate head room shown or required. Coordinate with Work of other Divisions to achieve proper headroom.
8. Before routing conduits through roof, approval from the Commissioner must be obtained. Where conduits are permitted to penetrate the roof, flash and counter-flash these conduits in accordance with the requirements of Thermal and Moisture Protection under Architectural Division.
9. Provide clearance and do not obstruct spaces required by code in front of electrical equipment, access doors, etc.
10. Size conduit per NEC/NYCEC for conductor type THW, 3/4-inch minimum size for metallic conduit and 1 inch minimum size for non metallic conduit.
11. Maintain minimum 6 inch clearance between conduit and piping. Maintain 12 inch clearance between conduit and heat sources such as flues, steam pipes, and heating appliances.
12. No conduit shall be attached to a cable tray or installed within 6 inches of a cable tray or light fitting except for termination
13. Use conduit hubs for fastening threaded conduit to sheet metal boxes, and for fastening conduit to enclosures in damp or wet locations.
14. Install no more than the equivalent of three, 90-degree bends between boxes.
15. Use conduit bodies to make sharp changes in direction, as around beams.
16. Avoid moisture traps where possible; where unavoidable, provide junction box with drain fitting at conduit low point.
17. Use suitable conduit caps to protect installed conduit against entrance of dirt and moisture.

18. Provide No. 12 AWG insulated conductor or 1 / 8 in. braided polypropylene pull rope in empty conduit up to 2 inch size and 3/8 inch pull rope in conduit over 2 inch size. Provide at least 12 in. slack of pull rope at both ends of the conduit.
19. Where conduit penetrates fire-rated walls and floors, seal opening around conduit with UL listed firestop system to maintain wall or floor rating and in accordance with the manufacturer's requirement.
20. Conduit enters the building through a concrete foundation wall below grade level, a watertight entrance seal shall be used. The seal shall be OZ/Gedney or equal.

B. Rigid Metallic Conduit

1. Install only Rigid Galvanized Steel Conduit (RGS) type in the following areas:
  - a. Areas classified as hazardous
  - b. For security systems
  - c. Exterior locations
  - d. Underground,
  - e. System operating at over 600 Volts,
  - f. Exposed to mechanical damage and installed at 8 feet or less to the finished floor
  - g. Fire Alarm power circuits
  - h. Mechanical rooms
  - i. Electrical incoming service
  - j. Where shown on the Contract Drawings.
2. Where approved by the Commissioner, concrete embedded conduits shall be RGS and the maximum conduit size shall be 1 in.
3. RGS conduit to be installed underground shall be 2 inches minimum in size, unless otherwise shown on the Contract Drawings.
4. RGS conduit installed in the ground shall have water-tight joints and shall be painted the entire length with two coats of protective finish such as asphaltum or factory-coated with a phenolic resin epoxy material. All coating shall be applied in accordance with the manufacturer's recommendations. The entire length of the conduit, including fittings, in contact with the ground, to a point 6 in. above the ground (or concrete slab), shall be completely coated, subject to the Commissioner's approval.
5. RGS conduit shall be joined with pipe couplings and shall be secured in cabinets, outlets, etc., with double locknuts and insulated throat bushings. Conduits terminating in cabinets, outlets, etc., shall be provided with approved steel insulating grounding bushings.

6. Intermediate metal conduit (IMC) may be used in locations approved by the Commissioners.

C. Electrical Metallic Tubing (EMT)

1. EMT may be used for power feeders and branch circuits except where RGS and IMC are specifically required.

D. Flexible Metal Conduit

1. Flexible Steel Conduit (FSC) shall be used for the following installation and shall not exceed 18 inches in length unless otherwise noted:
  - a. Motor final connections and for other equipment connections where subject to movement and vibration.
  - b. Transformers
  - c. Luminaires final connections but not to exceed (6 ft),(4 ft).
  - d. Appliances
  - e. Fan power terminal units
  - f. Equipment and devices requiring physical adjustment or removal for maintenance.
2. Liquid tight flexible steel conduit (LSC) is not permitted as a wiring method and is limited to the same FSC installation restrictions and also subjected to one or more of the following conditions:
  - a. Exterior locations.
  - b. Interior locations which are subjected to condensation, moist, wet or humid conditions;
  - c. Corrosive atmospheres;
  - d. Water spray;
  - e. Dripping oil, grease or water.
3. Install FSC and LSC with an insulated solid copper bonding jumper, sized according to code requirement.

E. Surface Metal Raceways

1. Only metallic surface metal raceways will be permitted, unless otherwise shown on the Contract Drawings. Installation shall be in accordance with manufacturer's written recommendations and instructions accompanying the raceways.
2. Raceway shall be secured at intervals not exceeding 10 feet or in accordance with manufacturer's requirement.
3. Provide surface raceway system with means for assuring a continuous ground path throughout and connected to electrical outlets, boxes, etc..

4. Use fittings without sharp edges introduced into any part of the raceway system.
5. All raceway systems shall be installed complete, including insulating bushings and inserts. All unused openings shall be closed.

F. Rigid non-metallic conduit

1. Use PVC-coated rigid steel factory elbows for bends in plastic conduit runs longer than 100 feet, or in plastic conduit runs which have more than two bends regardless of length. Use PVC-coated rigid steel factory elbows for vertical bends and slab penetrations in plastic conduit runs.

G. SUPPORTS

1. All horizontal conduits throughout the building shall be thoroughly and securely supported in groups using adjustable trapeze with each conduit strapped in place with galvanized pipe clamp. Utilize B-line steel channel for trapeze support.
2. Hanger steel threaded rod with rod coupling, expansion anchor, steel channels, etc shall be sized and designed per manufacturer's requirements for the load intended. Perforated extension bar hangers will not be accepted in any part of the Work.
3. Hangers shall not be spaced more than ten feet apart. Arrange conduit supports to prevent distortion of alignment by wire pulling operations.
4. All vertical Conduits shall be securely supported at floor lines to carry the weight of the conduit and cable in a satisfactory manner. Supports shall be sized to accept the horizontal seismic loads. Special hangers and supports shall be provided where they may be required because of any peculiarities of construction.
5. Where exposed to weather, conduit hangers and supports shall be Robroy Industries "Plasti-Bond-Red", or approved equal. Damaged hangers and supports shall be field-coated with Robroy Industries "Plasti-Bond-Red Touch-Up", or approved equal.
6. Conduits 3/4 in. in size within hung ceilings may be supported to ceiling rods with rod fasteners if the allowable loading of the rods is not exceeded and approved by Commissioner. No more than four conduits shall be secured to one hung ceiling rod.
7. Armored cables or metal clad cables where specifically permitted on the drawings, shall be supported in accordance with code requirement and no more than four cables shall be secured to one hung ceiling rod.
8. Only steel fasteners from approved manufacturers shall be used for supporting the armored cables, metal clad cables and 3 / 4 in. conduits and fasteners shall be used in accordance with the manufacturer's recommendations.

H. EXPANSION/DEFLECTION

1. Furnish and install fittings for rigid steel conduit exposed to water or embedded in concrete.
2. Furnish and install fittings for rigid steel conduit exposed to weather.
3. Furnish and install fittings for EMT.
4. Furnish and install fittings for conduit subjected to deflection and straight line movement.
5. All fittings shall have grounding and bonding jumpers.

END OF SECTION 26 0533

SECTION 26 0534

BOXES AND FLOOR BOXES

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Wall and ceiling outlet boxes.
- B. Floor boxes.
- C. Pull and junction boxes.

1.3 RELATED SECTIONS

- A. Section 07 8413 – Firestops and Smoke seals
- B. Section 08 3113 - Access Doors
- C. Section 26 2726 - Wiring Devices

1.4 REFERENCES

- A. ANSI/NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.
- B. ANSI/NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- C. ANSI/NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
- D. ANSI/NFPA 70 - National Electrical Code.
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.5 SUBMITTALS

- A. Refer and comply with Section 26 0500, Common Work Results for Electrical.
- B. List of box construction, size and finish indicating where each type will be used.

## 1.6 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

## 1.7 PROJECT CONDITIONS

- A. Verify field measurements are as shown on Drawings.
- B. Verify locations of floor boxes and outlets prior to rough-in.
- C. Electrical boxes are shown on Drawings in approximate locations unless dimensioned.

## PART 2 - PRODUCTS

### 2.1 OUTLET BOXES

- A. Hazardous Location Fittings and Outlet Boxes:
  - 1. Conform to UL Std. 886 and NEC
  - 2. Fittings shall be malleable iron construction
  - 3. Acceptable Manufacturers
    - a. OZ/Gedney
    - b. Appleton
    - c. Cooper Crouse-Hinds
    - d. Or Approved Equal
- B. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized steel. Minimum size 4 inches square for power, 4 11/16" x 4 11/16" x 2 1/8" deep for telephone and data, unless otherwise noted.
  - 1. Acceptable manufacturers:
    - a. Steel City
    - b. Raco
    - c. Bowers
    - d. Or approved equal.
  - 2. Luminaire and equipment supporting boxes: Rated for weight of equipment supported; include 1/2-inch male fixture studs where required.

3. Concrete ceiling boxes: Concrete type, 4 inch octagonal.
- C. Nonmetallic Outlet Boxes: ANSI/NEMA OS 2.
- D. Cast Boxes: NEMA FB 1, Type FD, cast ferrous alloy. Provide gasketed cover by box manufacturer. Provide threaded hubs. Manufacturers: Appleton, Crouse-Hinds or approved equal.

## 2.2 FLOOR BOXES

- A. Floor Boxes: ANSI/NEMA OS 1, fully adjustable before and after concrete pour, cast metal body, complete with all necessary fittings.
1. FSR
  2. Wiremold
  3. Hubbell
  4. Or approved equal.
- B. For Pullbox or Flush Outlets:
1. Steel City 600 series.
  2. Walker 889 series.
  3. Hubbell B2537.
  4. Or approved equal.
- C. Conform to regulatory requirements for concrete-tight floor boxes.

## 2.3 PULL AND JUNCTION BOXES

- A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- B. Surface-Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface-mounted junction box.
1. Material: Cast aluminum.
  2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.
- C. In-Ground Cast Metal Box for Pedestrian or Light Vehicular Traffic Areas: NEMA 250, Type 6, flanged, recessed cover box for flush mounting.
1. Material: Galvanized cast iron.
  2. Cover: Nonskid cover with neoprene gasket and stainless steel cover screws.



3. Cover legend: Electric or as noted.
4. Manufacturers: Crouse-Hinds, Appleton or approved equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install electrical boxes as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- B. Install electrical boxes to maintain headroom and to present neat mechanical appearance.
- C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- D. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- E. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods under the provisions of Section 07 2700.
- F. Align adjacent wall-mounted outlet boxes for switches, thermostats, and similar devices with each other.
- G. Use flush mounting outlet boxes in finished areas.
- H. Do not install flush mounting boxes back-to-back in walls; provide minimum 6 inch separation. Provide minimum 24 inches separation in acoustic rated and fire rated walls.
- I. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- J. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- K. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- L. Use adjustable steel channel fasteners for hung ceiling outlet box.
- M. Do not fasten boxes to ceiling support wires.
- N. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12 inches of box.
- O. Use gang box where more than one device is mounted together. Do not use sectional box.
- P. Use gang box with plaster ring for single device outlets.

- Q. Use cast outlet box with gasketed cover plate in exterior locations and wet locations (including under the soffits and canopies).
- R. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.
- S. Set floor boxes level to top of slab.
- T. When casting floor boxes in slab each floor box must be provided with a drag wire to pull cables and provided with protective cover to prevent concrete from entering the floor box prior to concrete pour.
- U. Large Pull Boxes: Boxes larger than 100 cubic inches in volume or 12 inches in any dimension.
  - 1. Interior Dry Locations: Use hinged enclosure.
  - 2. Other Locations: Use surface-mounted cast metal box.

### 3.2 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations and sizes of required access doors with Section 08 3113.
- B. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- C. Coordinate mounting heights and locations of outlets mounted above counters, benches and backsplashes.
- D. Position outlet boxes to locate luminaires as shown on reflected ceiling plan.

### 3.3 ADJUSTING

- A. Adjust floor box flush with finish flooring material.
- B. Adjust flush-mounting outlets to make front flush with finished wall material.
- C. Install knockout closure in unused box openings.

END OF SECTION 26 0534

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SECTION 26 0553  
ELECTRICAL IDENTIFICATION

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Nameplates and labels.
- B. Wire and cable markers.
- C. Conduit color coding.
- D. Conduit markers.
- E. Panelboard Directories.

1.3 RELATED WORK

- A. Section 09 9100 – Painting and Finishing

1.4 SUBMITTALS

- A. Submit shop drawings under Common Work Results for Electrical as applicable.
- B. Include data sheets for identification materials furnished.
- C. Include schedule for nameplates and labels.
- D. Include sample engraved nameplate of each type and size.

PART 2 - PRODUCTS

2.1 NAMEPLATES

- A. Type NP: Engraved three-layer laminated plastic, with white letters on black background.

2.2 LEGEND PLATES

- A. Type LP: Die-stamped metal legend plate with mounting hole and positioning key.
- B. Paint-fill engraved characters.

### 2.3 WIRE AND TERMINAL MARKERS

- A. Self-adhering, pre-printed, self-laminating vinyl wrap-around strips.
- B. Manufacturers:
  - 1. Thomas & Betts WSL, Brady B191 series
  - 2. WireMarkersPlus/ NelcoProducts, Inc.
  - 3. Grafoplast Wire Makers/Sunlec International Pty Ltd.
  - 4. Or approved equal

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Degrease and clean surfaces to receive nameplates and labels.
- B. Install nameplates and labels parallel to equipment lines.
- C. Secure nameplates to equipment fronts using screws, rivets, or adhesive. Secure nameplate to inside face of recessed panelboard doors in finished locations.
- D. Do not use tape for any application.

### 3.2 WIRE IDENTIFICATION

- A. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on equipment manufacturer's shop drawings for control wiring.
- B. Provide conductor phase color coding as per Section 26 0519.

### 3.3 NAMEPLATE ENGRAVING

- A. Provide type "NP" nameplates of minimum letter height as noted below:
  - 1. Panelboards, Switchboards and Motor Control Centers: 1/4-inch to identify equipment designation. 1/8-inch to identify voltage and current rating, phase and source. Manufacturers SO number amperes interrupting capacity (AIC) and date of manufacture.

2. Individual Circuit Breakers, Switches and Motor Starters in Panelboards, Switchboards, and Motor Control Centers: 1/8-inch to identify circuit and load served, including location.
3. Individual Circuit Breakers, Enclosed Switches, and Motor Starters: 1/8-inch to identify load served.
4. Equipment Cabinets, Terminal Cabinets, Control Panels and other Cabinets enclosing apparatus: 3/8-inch to identify equipment and designation.

- B. Provide type "LP" metal legend plates for attachment to panel mounted operator's devices such as pilot lights, push buttons, selector switches, etc.

#### 3.4 CONDUIT COLOR CODING SCHEDULE

- A. Coordinate color of paint with Section 09 900 - Painting to identifying conduit by system.
- B. 208 Volt, Three Phase System: Green.
- C. Fire Alarm System: Red. 1 inch wide band minimum every 5 feet of conduit length.

#### 3.5 PANELBOARD DIRECTORIES

- A. Provide typewritten directories arranged in numerical order showing number of room in which each device served by each panelboard circuit is located.
- B. Verify room numbers to be used with Commissioner. Room number will not necessarily be those used on the Drawings.
- C. Mount directories in a 6 inch by 8 inch metal frame under a clear plastic cover inside each panelboard door.

END OF SECTION 26 0553

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SECTION 260800

COMMISSIONING OF ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.
- B. The OPR and BOD documentation are included by reference for information only.
- C. Division 01 section 'LEED Requirements' for additional LEED requirements.

1.2 SUMMARY

- A. This section includes commissioning process requirements for Electrical systems, assemblies, and equipment.
- B. Related Sections:
  - 1. Division 01 Section "General Commissioning Requirements" for general commissioning process requirements.

1.3 DESCRIPTION

- A. Refer to Division 01 Section "General Commissioning Requirements" for the description of commissioning.

1.4 DEFINITIONS

- A. Refer to Division 01 Section "General Commissioning Requirements" for definitions.

1.5 SUBMITTALS

- A. Refer to Division 01 Section "General Commissioning Requirements" for CxA's role.
- B. Refer to Division 01 Section "Submittals" for specific requirements. In addition, provide the following:
- C. Certificates of readiness
- D. Certificates of completion of installation, prestart, and startup activities.
- E. O&M manuals



- F. Test reports

## 1.6 QUALITY ASSURANCE

- A. Test Equipment Calibration Requirements: Contractors 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. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to coordination during the commissioning 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 electrical contractor of Division 26 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 each contractor.
- B. Special equipment, tools and instruments (specific to a piece of equipment and only available from vendor) required for testing shall be included in the base bid price to the City of New York and left on site, except for stand-alone data logging equipment that may be used by the CxA.
- C. 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.
- D. Data logging equipment and software required to test equipment will be provided by the CxA, but shall not become the property of the City of New York.
- E. 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 an accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

## PART 3 - EXECUTION

## 3.1 GENERAL DOCUMENTATION REQUIREMENTS

- A. With assistance from the installing contractors, the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems
- B. **Red-lined Drawings:** 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:** 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 Instruction:** Contractor will provide demonstration and instruction as required by the specifications. A complete instruction plan and schedule must be submitted by the Contractor to the CxA four weeks (4) prior to any instruction. A instruction agenda for each instruction session must be submitted to the CxA one (1) week prior the instruction session

## 3.2 CONTRACTOR'S RESPONSIBILITIES

- A. Perform commissioning tests at the direction of the CxA.
- B. Attend construction phase controls coordination meetings.
- C. Participate in Electrical systems, assemblies, equipment, and component maintenance orientation and inspection as directed by the CA.
- D. Provide information requested by the CxA for final commissioning documentation.
- E. Prepare preliminary schedule for Electrical system orientations and inspections, operation and maintenance manual submissions, instruction sessions, equipment start-up and task completion for the Commissioner. Distribute preliminary schedule to commissioning team members.
- F. Update schedule as required throughout the construction period.
- G. Assist the CxA in all verification and functional performance tests.
- H. 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.
- I. 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.

- J. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.
- K. 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.
- L. Participate in, and schedule vendors and contractors to participate in the instruction sessions.
- 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.
  - 2. Emergency generators, ATS switches and emergency power systems.
  - 3. Fire alarm system
- N. The equipment supplier shall document the performance of his equipment.
- O. Provide a complete set of red-lined drawings to the CxA prior to the start of Functional Performance Testing.
- P. Equipment Suppliers
  - 1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Commissioner, to keep warranties in force.
  - 2. Assist in equipment testing per agreements with contractors.
  - 3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.
- Q. Refer to Division 01 Section "General Commissioning Requirements" for additional Contractor responsibilities.

### 3.3 COMMISSIONER'S RESPONSIBILITIES

- A. Refer to Division 01 Section "General Commissioning Requirements" for Commissioner's Responsibilities.

### 3.4 CxA'S RESPONSIBILITIES

- A. Refer to Division 01 Section "General Commissioning Requirements" for CxA's 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 contractor and other contracted 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 CA.
- B. **Electrical Instrumentation and Control System Testing:** Field testing plans and testing requirements are specified in Division 26 Sections "Instrumentation and Control" and "Sequence of Operations" Assist the CxA with preparation of testing plans.
- C. **Emergency Generator Testing and Acceptance Procedures:** 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. **Fire Detection and Alarm System Testing:** Provide technicians, 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.
- E. **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
- F. **Vibration and Sound Tests:** Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.
- G. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. The following equipment and systems shall be evaluated:
1. Automatic temperature controls integrated with the electrical systems
  2. Coordination and functionality with the Building Automation System/Building Management Controls System
  3. Fire Alarm System
  4. Lighting Controls
  5. Panelboards
  6. Power Distribution System
  7. Security System
  8. Switchboard

3.8 DEFICIENCIES/NON-CONFORMANCE, COST OF RETESTING, FAILURE DUE TO MANUFACTURER DEFECT

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to deficiencies/non-conformance, cost of retesting, or failure due to manufacturer defect.

3.9 APPROVAL

- A. Refer to Division 01 Section "General Commissioning Requirements" for approval procedures.

3.10 DEFERRED TESTING

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to deferred testing.

3.11 OPERATION AND MAINTENANCE MANUALS

- A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in Division 01.
- B. Refer to Division 01 Section "General Commissioning Requirements" for the AE and CxA roles in the Operation and Maintenance Manual contribution, review and approval process.

3.12 INSTRUCTION OF CITY OF NEW YORK PERSONNEL

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to instruction.

END OF SECTION 260800

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## SECTION 26 0923

## LIGHTING CONTROL DEVICES

## PART 1 GENERAL

## 1.1 INTRODUCTION

- A. The work covered in this section is subject to all of the requirements in the Common Work Results for Electrical of the Specifications. Contractor shall coordinate all of the work in this section with all of the trades covered in other sections of the specification to provide a complete and operable system.

## 1.2 SYSTEM DESCRIPTION

- A. Install a lighting control system consisting of relay/contacter panel(s), control switches, occupancy sensors, photocells and other controlling devices. The devices are connected by low voltage and line voltage wiring. The general operation of lighting and controlled loads shall include:
1. Interior lighting: Manual switch and occupancy sensor control on/off with automatic time scheduled shut off.
  2. Scheduled on/off loads: Time on, time off by automatic time schedule with after hour override capability and shutoff.
  3. Exterior lighting: Photocell or astronomic on/time off, time on/photocell or astronomic off.
  4. Exterior security lighting: Photocell or astronomic on, photocell or astronomic off.

## 1.3 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in the manufacture of lighting control equipment and ancillary equipment, of types and capacities, whose products have been in satisfactory use in similar service for not less than 3 years.
- B. NEC Compliance: Comply with NEC as applicable to electrical wiring work.
- C. NEMA Compliance: Comply with applicable portions of NEMA standards pertaining to types of electrical equipment and enclosures.
- D. UL Approvals: UL listed under UL 916 Energy Management Equipment.
- E. FCC Emissions: Compliance with FCC emissions Standards specified in Part 15 Subpart J for Class A application.



## 1.4 SUBMITTALS

- A. Shop Drawings: Submit dimensional drawings of all lighting control system components and accessories.
- B. One Line Diagram: Submit a one-line diagram of the proposed system configuration if it differs from that illustrated in the riser diagram included in the contract drawings.
- C. Typical Wiring Diagrams: Submit typical wiring diagrams for all components including, but not limited to, lighting control panels, relays, contactors, photocells, switches, occupancy sensors and day lighting controls.

## PART 2 PRODUCTS

### 2.1 DUAL TECHNOLOGY OCCUPANCY SENSOR

#### A. Description

The dual technology sensor shall be capable of detecting presence in the control area, by detecting changes in the infrared energy and utilizing ultrasonic technology to detect motion. Small movements shall be detected such as when a person is writing while seated at a desk.

#### B. Features

1. Advance control logic based on RISC micro-controller.
2. Detector Signature Processing to eliminate false triggers and provide immunity to RFI and EMI
3. Walk-through mode to turn lights off three (3) minutes after the area is initially occupied.
4. Built-in light level sensor featuring simple, one-step setup.
5. Sensor shall have standard 5 year warranty.
6. Sensor shall be UL and CUL listed.

### 2.2 BASIS OF DESIGN

#### A. Watt Stopper/Legrand; Occupancy Sensor: DT-355

1. Or equal meeting the requirements of 2.1.

The contractor shall be completely responsible for providing a system that meets this specification in its entirety. All deviations from this specification must be listed and individually signed off by the Commissioner.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. All occupancy sensors, shall be mounted as indicated on the Reflected Ceiling Plans. All wiring shall be labeled clearly indicating which lighting control panel or

device it connects to. Use only properly color-coded, stranded wire as indicated on the drawings.

3.2 CONTRACTOR PROVIDED INFORMATION

A. Contractor shall provide system documentation after the equipment has been installed:

1. Lighting control operational summary sheet.
2. System Installation and Operation Manual shall be provided to the owner.

3.3 WARRANTY

A. Manufacturer shall provide a three year warranty for all system components.

END OF SECTION 26 0923

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## SECTION 26 09 36

## MODULAR DIMMING CONTROLS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Central dimming control systems.
  - 2. Lighting control system consisting of relay/contactor panel(s), control switches, occupancy sensors, photocells and other controlling devices.
- B. Related Sections:
  - 1. Section 262726 - Wiring Devices
  - 2. Section 262727 - Wireless Wiring Devices
  - 3. Section 265000 - Architectural Lighting.

## 1.2 REFERENCES

- A. American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) ([www.ansi.org](http://www.ansi.org) and [www.ieee.org](http://www.ieee.org))
  - 1. C62.41-1991 - Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
- B. ASTM International (ASTM) ([www.astm.org](http://www.astm.org))
  - 1. D4674 -02a Standard Test Method for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Fluorescent Lighting and Window-Filtered Daylight.
- C. International Organization for Standardization (ISO)
  - 1. 9001:2000 - Quality Management Systems.
- D. National Electrical Manufacturers Association (NEMA)
  - 1. WD1 (R2005) - General Color Requirements for Wiring Devices.
- E. Underwriters Laboratories, Inc. (UL)[www.ul.com](http://www.ul.com)
  - 1. 489 (2002) - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.
  - 2. 508 (1999) - Standard for Industrial Control Equipment.
  - 3. 1472 (1996) - Solid-State Dimming Controls.
  - 4. 924 (2003) - Emergency Lighting and Power Equipment
- F. Federal Communications Commission (FCC) rules - Part 15 (Class B): Radio Frequency Devices

## 1.3 SYSTEM DESCRIPTION

- A. Modular dimming control: Factory assembled dimming control, interfaces, and modules. Low voltage wall stations, control interfaces, and sensors.
- B. Lighting control system consisting of relay/contactor panel(s), control switches, occupancy sensors, photocells and other controlling devices. The devices are

connected by low voltage and line voltage wiring. The general operation of lighting and controlled loads shall include:

1. Interior lighting: Manual switch and occupancy sensor control on/off with automatic time scheduled shut off.
2. Scheduled on/off loads: Time on, time off by automatic time schedule with after hour override capability and shutoff.
3. Exterior lighting: Photocell or astronomic on/time off, time on/photocell or astronomic off.
4. Exterior security lighting: Photocell or astronomic on, photocell or astronomic off.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 013300.
- 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.
- C. Shop Drawings; include:
  1. One Line Diagram: Submit a one-line diagram of the proposed system configuration if it differs from that illustrated in the riser diagram included in the contract drawings.
  2. Typical Wiring Diagrams: Submit typical wiring diagrams for all components including, but not limited to, lighting control panels, relays, contactors, photocells, switches, occupancy sensors and day lighting controls.
  3. Load schedule indicating actual connected load, load type, and voltage per circuit, circuits and their respective control zones, circuits that are on emergency, and capacity, phase, and corresponding circuit numbers
- D. Product Data: Catalog cut sheets with performance specifications demonstrating compliance with specified requirements.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Provide Operation and Maintenance Manuals:
  1. Including:
    - a. Warranty Information
    - b. System Start-up Information
    - c. Installation Guide
    - d. Set-up and Programming Guide
  2. Electronic format to be available on Lighting Control System manufacturer website.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer: Minimum three years experience in manufacture of architectural lighting controls.
- B. Manufacturer's Quality System: Registered to ISO 9001:2000 Quality Standard, including in-house engineering for product design activities.

- C. Central dimming control system:
  - 1. Listed by UL specifically for the required loads. Provide evidence of compliance upon request.

#### 1.7 PROJECT CONDITIONS

- A. Do not install equipment until following conditions can be maintained in spaces to receive equipment:
  - 1. Ambient temperature: 32 degrees to 104 degrees.
  - 2. Relative humidity: Maximum 90 percent, non-condensing.
  - 3. Lighting control system must be protected from dust during installation.

#### 1.8 WARRANTY

- A. Provide Manufacturer's standard two-year Warranty, including:
  - 1. 100 Percent Replacement Parts for Manufacturer Lighting System Components
  - 2. 100 Percent Manufacturer Labor Coverage to Troubleshoot and Diagnose a Lighting Issue
  - 3. First-Available Onsite or Remote Response Time
  - 4. 24 Hours Per Day, 7 Days Per Week Telephone Technical Support, Excluding Manufacturer Holidays
  - 5. Remote Diagnostics for Applicable Systems

### PART 2- PRODUCTS

#### 2.1 MANUFACTURERS

- A. Basis of design product: Lutron QS or equal system by Rako or Leviton, or equal, subject to compliance and approval with specified requirements of this section.

#### 2.2 GENERAL

- A. Provide system hardware that is designed, tested, manufactured, and warranted by a single manufacturer.
- B. Architectural Lighting Controls: Ten-year operational life while operating continually at any temperature in an ambient temperature range of 0 degrees C (32 degrees F) to 40 degrees C (104 degrees F) and 90 percent non-condensing relative humidity.
- C. Designed and tested to withstand electrostatic discharges up to 15,000 V without impairment per IEC 801-2.
- D. Wireless Devices shall:
  - 1. Have addresses automatically assigned to them.
  - 2. Receive signals from other wireless devices and provide feedback to user.
  - 3. Work in conjunction with wireless occupancy sensors, wireless vacancy sensors, and wireless controllers.
  - 4. Use proprietary Radio Frequency (RF) protocol.
  - 5. Use RF communication in compliance with FCC Part 15.231.

#### 2.3 DIMMING PERFORMANCE REQUIREMENTS

- A. Electrolytic capacitors to operate at least 20 degrees C below the component manufacturer's maximum temperature rating when device is under fully-loaded conditions in 40 degrees C (104 degrees F) ambient temperature.
- B. Load Handling Thyristors (SCRs and triacs), Field Effect Transistors (FETs), and Isolated Gate Bipolar Transistors (IGBTs): Manufacturer's maximum current rating minimum two times control's rated operating current.
- C. Capable of withstanding repetitive inrush current of 50 times operating current without impacting lifetime of dimmer.
- D. Design and test dimmers to withstand line-side surges without impairment to performance.
  - 1. Withstand surges without impairment of performance when subjected to surges of 6,000 volts, 3,000 amps per ANSI/IEEE C62.41.
  - 2. Other power handling devices: Withstand surges without impairment of performance when subjected to surges of 6,000 volts, 200 amps per ANSI/IEEE C62.41.
- E. Utilize air gap off – activated when user selects "off" at any control to disconnect the load from line supply.
- F. Power failure memory and dimmer/relay recovery:
  - 1. When power is interrupted and subsequently returned, within 3 seconds lights will automatically return to same levels (dimmed setting, full on, or off) prior to power interruption.
- G. Multiple load type, tested to UL 508 to specifically control incandescent/tungsten, magnetic low voltage, electronic low voltage, neon/cold cathode, digital fluorescent dimming ballasts, fluorescent dimming ballasts, and non-dim loads...
- H. Each dimmer to be assigned a load type that will provide a proper dimming curve for the specific light source.
- I. Possess ability to have load types assigned per circuit, configured in field.
- J. Minimum and maximum light levels user adjustable on circuit-by-circuit basis.
- K. Control all light sources in smooth and continuous manor. Dimmers with visible steps are not acceptable.
- L. Provide real-time cycle-by-cycle compensation for incoming line voltage variations including changes in RMS voltage (plus or minus 2 percent change in RMS voltage/cycle), frequency shifts (plus or minus 2 Hz change in frequency/second), dynamic harmonics, and line noise. Systems not providing cycle-by-cycle compensation to include external power conditioning equipment to meet these requirements.
- M. Systems not providing cycle-by-cycle compensation to include external power conditioning equipment as part of dimming system.
- N. Each dimmer to incorporate electronic "soft-start" default at initial turn-on that smoothly ramps lights up to the appropriate levels within 0.5 seconds.
- O. Line Voltage Dimmers; Meet following load-specific requirements:

1. Magnetic Low Voltage (MLV) transformer:
    - a. Contain circuitry designed to control and provide a symmetrical AC waveform to input of magnetic low voltage transformers per UL 1472, Section 5.11.
    - b. Dimmers using back-to-back SCR construction that could fail open causing DC power to flow into magnetic low voltage load are not acceptable.
  2. Electronic Low Voltage (ELV) transformer: Dimmer to operate electronic low voltage transformers via reverse phase control. Alternately, forward phase control dimming may be used if dimming equipment manufacturer has recommended specific ELV transformers being provided.
  3. Neon and cold cathode transformers:
    - a. Magnetic transformers: UL listed for use with normal (low) power factor magnetic transformers. Electronic transformers: Must be supported by the transformer equipment manufacturer for control of specific transformers being provided.
  4. Fluorescent electronic dimming ballast: Refer to Section 265000 for dimming ballast specifications and performance.
- P. Direct low-voltage control of digital ballasts (120V, 220/240V, and/or 277V lighting):
1. Electronically link a digital fluorescent lighting ballast to a zone for both dimming and turn on/off
  2. Energy usage and light level status visible to operator on an integral display
  3. Electronically assign occupancy sensors for manual on/auto off and auto on/auto off
  4. Electronically assign daylight sensors to digital ballasts and line voltage dimmers for proportional daylight harvesting
  5. Single integral controller with Class 1 or Class 2 isolated digital output signal conforming to IEC 60929; capable of direct (no-interface) control.
- Q. Low Voltage Dimming Interface; Meet following requirements:
1. Coordination between low voltage dimming module and line voltage relay: Capable of being electronically linked to single zone.
  2. Single low voltage dimming module; capable of controlling following light sources:
    - a. 0-10V analog voltage signal.
      - 1) Provide Class 2 isolated 0-10V output signal conforming to IEC 60929.
      - 2) Sink current via IEC 60929.

## 2.4 POWER INTERFACES

- A. Provide power interfaces required as defined on project drawings.
- B. Electrical:
  1. Phase independent of control input.
  2. Dimmer to meet limited short circuit test as defined in UL 20.
- C. Diagnostics and Service: Replacing power interface does not require re-programming of system or processor.



## 2.5 WALL STATIONS

## A. Line Voltage Control Unit:

1. Product: GRAFIK Eye QS or approved equal
2. Preset lighting control with zone override:
  - a. Intensity for each zone indicated by means of one illuminated bar graph per zone.
  - b. Each zone and scene to be field customizable to indicate each zone and scene name.
  - c. Astronomical time clock and programmer interface
    - 1) Provide access to:
      - a) Scene selections.
      - b) Fade zone to a level.
      - c) Fine-tuning of preset levels with scene raise/lower.
      - d) Lock out scenes and zones.
      - e) Fine-tuning of light levels with individual zone raise/lower.
      - f) Terminal block for wired infrared signal input.
      - g) Enable/disable wall station.
  - d. Light intensity with real time energy savings by digital display.
  - e. Fade time indicated by digital display for current scene while fading.
  - f. Incorporate built-in wide angle infrared receiver.
  - g. For temporary local overrides, individual raise/lower buttons to allow zones to be adjusted without altering scene values stored in memory.
  - h. Wireless integration with occupancy/vacancy sensors, wireless controller, shades and other wireless control units by same manufacturer.
3. Color:
  - a. Custom color to be selected.
  - b. Color variation in same product family: Maximum  $\Delta E=1$ , CIE L\*a\*b color units.
  - c. Visible parts: Exhibit ultraviolet color stability when tested with multiple actinic light sources as defined in ASTM D4674. Provide proof of testing upon request.

## B. Architectural Low Voltage Wall Stations:

1. Product: see Touch QS or approved equal
2. Electronics:
  - a. Use RS485 wiring for low voltage communication.
3. Functionality:
  - a. LEDs to reflect the true system status. LEDs to remain illuminated if the button press was properly processed or the LEDs turn off if the button press was not processed.
  - b. Allow for easy reprogramming without replacing unit.
4. Provide faceplates with concealed mounting hardware.
5. Color:
  - a. Custom color to be selected.
  - b. Color variation in same product family: Maximum  $\Delta E=1$ , CIE L\*a\*b color units.
  - c. Visible parts: Exhibit ultraviolet color stability when tested with multiple

actinic light sources as defined in ASTM D4674. Provide proof of testing upon request.

## 2.6 SOURCE QUALITY CONTROL

- A. Perform full-function testing on completed assemblies at end of line. Statistical sampling is not acceptable.

## 2.7 DUAL TECHNOLOGY OCCUPANCY SENSOR

- A. Manufacturer: Basis of design product : Watt Stopper/Legrand Occupancy Sensor DT-355 or approved equal.
- B. Description:  
The dual technology sensor shall be capable of detecting presence in the control area, by detecting changes in the infrared energy and utilizing ultrasonic technology to detect motion. Small movements shall be detected such as when a person is writing while seated at a desk.
- C. Features:
  - 1. Advance control logic based on RISC micro-controller.
  - 2. Detector Signature Processing to eliminate false triggers and provide immunity to RFI and EMI
  - 3. Walk-through mode to turn lights off three (3) minutes after the area is initially occupied.
  - 4. Built-in light level sensor featuring simple, one-step setup.
  - 5. Sensor shall have standard 5 year warranty.
  - 6. Sensor shall be UL and CUL listed.

## PART 3- EXECUTION

### 3.1 INSTALLATION

- A. Install equipment in accordance with manufacturer's installation instructions.
- B. Provide complete installation of system in accordance with Contract Documents.
- C. Define each dimmer's load type, shade settings, and set control functions.
- D. Provide equipment at locations and in quantities indicated on Drawings. Provide any additional equipment required to provide control intent.
- E. Mount exterior daylight sensors to point due north with constant view of daylight.
- F. Ensure that daylight sensor placement minimizes sensors view of electric light sources; ceiling mounted and fixture-mounted daylight sensors shall not have direct view of luminaries.

### 3.2 STARTUP AND PROGRAMMING

- A. Provide telephone startup assistance to Electrical Contractor or End User

Representative (when available, in accordance with manufacturer's guidelines. Otherwise, onsite startup will be utilized.)

1. Provides access to a Factory Certified Telephone Startup Technician during normal business hours.
  2. Provides telephone instruction and guidance for a complete system functional test.
  3. With phone startup completion and End User Registration, the 1-year parts-only warranty will be upgraded to the Standard 2-year Warranty.
- B. Provide factory-certified field service engineer to a site visit to ensure proper system installation and operation under following parameters:
1. Qualifications for factory-certified field service engineer:
    - a. Minimum experience training in the electrical/electronic field.
    - b. Properly trained by the equipment manufacturer on the system installed.
  2. Make a visit upon completion of installation of modular dimming control system:
    - a. Verify connection of power feeds and load circuits.
    - b. Verify connection and location of controls.
    - c. Program system data.
    - d. Verify proper connection of digital control link.
    - e. Verify proper operation of manufacturers interfacing equipment.
    - f. Obtain sign-off on system functions.
    - g. User to be instructed on system operation.

END OF SECTION

SECTION 26 2416

PANELBOARDS

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Lighting and appliance branch circuit panelboards.

1.3 REFERENCES

- A. NEMA AB 1 - Molded Case Circuit Breakers.
- B. NEMA PB 1 - Panelboards.
- C. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
- D. NEMA PB 1.2 - Application Guide for Ground-fault Protective Devices for Equipment.

1.4 SUBMITTALS

- A. Submit shop drawings for equipment and component devices under provisions of General Conditions.
- B. Include outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker arrangement and sizes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - PANELBOARDS

- A. Cutler Hammer
- B. General Electric
- C. Square D
- D. Or approved equal.

2.2 BRANCH CIRCUIT PANELBOARDS

- A. Lighting and Appliance Branch Circuit Panelboards: NEMA PB 1 circuit breaker type.
- B. Enclosure: NEMA PB 1; Type 1.
- C. Cabinet Size: 6 inches deep; 24 inches wide for 208 volt panelboards.
- D. Provide flush or surface cabinet front as shown on the Drawings with concealed trim clamps, concealed hinge and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.
- E. Provide panelboards with copper bus, ratings as scheduled on Drawings. Provide copper ground bus in all panelboards.
- F. Minimum Integrated Short Circuit Rating 22,000 amperes rms symmetrical for 208 volt panelboards or as shown on Drawings. The final short circuit rating shall be as required by the Short Circuit/Coordination Study.
- G. Molded Case Circuit Breakers: NEMA AB 1; bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles. Provide circuit breakers UL listed as Type SWD for lighting circuits. Provide UL Class A ground fault interrupter circuit breakers where indicated on the Drawings.
- H. Current Limiting Molded Case Circuit Breakers: NEMA AB 1; provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install panelboards plumb in conformance with NEMA PB 1.1.
- B. Height: Six feet to top.
- C. Provide filler plates for unused spaces in panelboards.
- D. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
- E. Stub 5 empty one-inch conduits to accessible location above ceiling out of each recessed panelboard.

#### 3.2 FIELD QUALITY CONTROL

- A. Measure steady state load currents at each panelboard feeder. Should the difference at any panelboard between phases exceed 20 percent, rearrange circuits in the panelboard to balance the phase loads within 20 percent. Take care to maintain proper balancing for multi-wire branch circuits.

- B. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers.

END OF SECTION 26 2416

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SECTION 26 2726

WIRING DEVICES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Wall switches.
- B. Wall dimmers.
- C. Receptacles.
- D. Device plates and decorative box covers.
- E. Floor box service fittings.
- F. Access floor boxes.

1.3 REFERENCES

- A. NEMA WD 1 - General Purpose Wiring Devices.
- B. NEMA WD 2 - Semiconductor Dimmers for Incandescent Lamps.
- C. NEMA WD 6 - Wiring Device Configurations.

1.4 SUBMITTALS

- A. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
- B. Samples: Submit one sample of each type device and cover plate.
- C. Manufacturer's Instructions:
  - 1. Indicate application conditions and limitations of use stipulated by product testing agency specified under regulatory requirements.
  - 2. Include instructions for storage, handling, protection, examination, preparation, operation and installation of product.



## 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

## PART 2 - PRODUCTS

### 2.1 WALL SWITCHES

- A. Description:
  - 1. TOGGLE SWITCHES: NEMA WD 1, heavy-duty, AC only general-use, quiet type snap switch with fast make-slow break, silver-cadmium oxide alloy contacts, side and back wired.
  - 2. ROCKER SWITCHES: NEMA WD 1, AC general use only, extra quiet type rocker switch with fast make, slow break contacts, side and back wired.
- B. Device Body: White plastic with white plates, black plastic with stainless steel plates with matching switch handle.
- C. Illuminated Handle Type Switch: To match device body.
- D. Pilot Light: lighted handle type switch, red polycarbonate handle.
- E. Voltage Rating: 120-277 volts, A.C.
- F. Current Rating: 20 amperes.
- G. Manufacturers and Model Numbers:
  - 1. Single-pole switch:
    - a. Lutron Nova-T model NT-1PS-SN or approved equal by Leviton or Hubbell.
  - 2. Double-pole switch:
    - a. Lutron Nova-T multi gang or equal by Leviton or Hubbell.
  - 3. Three-way switch:
    - a. Lutron Nova-T model NT-3PS-SN or approved equal by Leviton or Hubbell.
  - 4. Four-way switch:
    - a. Lutron Nova-T model NT-4PS-ST or approved equal by Leviton or Hubbell.

## 2.2 RECEPTACLES

- A. Description: NEMA WD1, heavy duty general-use receptacle.
- B. Device Body: White plastic with white plates, black plastic with stainless steel plates.
- C. Configuration: NEMA WD6, type as specified and indicated.
- D. Convenience Receptacle: Type 5-20R.
- E. Construction:
  - 1. Nylon housing.
  - 2. Brass contacts.
  - 3. Solid Center rivet.
  - 4. Back and side wiring type.
- F. Manufacturers and Model Number:
  - 1. Duplex convenience receptacle:
    - a. Lutron Nova-T model NTR-20-ST
    - b. Leviton
    - c. Hubbell.
  - 2. GFCI receptacle:
    - a. Lutron Nova-T model NTR-20-GFCI-ST
    - b. Leviton
    - c. Hubbell.
  - 3. Special receptacle:
    - a. Type as identified by NEMA standard number on drawings.

## 2.3 WALL PLATES

- A. Decorative Cover Plate: Screwless white and stainless steel (at locations as shown on the architectural drawings) Lutron Nova-T, Leviton, Hubbell, or approved equal.
- B. Weatherproof Cover Plate: Gasketed cast metal with hinged gasket device cover.
  - 1. Hubbell
  - 2. Leviton
  - 3. Arrow-Hart/Cooper
  - 4. Or approved equal.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify outlet boxes are installed at proper height.
- B. Verify wall openings are neatly cut and will be completely covered by wall plates.
- C. Verify floor boxes are adjusted properly.
- D. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring device.
- E. Verify openings in access floor are in proper locations.

### 3.2 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surfaces.
- B. Clean debris from outlet boxes.

### 3.3 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install devices plumb and level.
- C. Install switches with OFF position down.
- D. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.
- E. Do not share neutral conductor on load side of dimmers.
- F. Install receptacles with grounding pole on bottom or right-hand side.
- G. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.
- H. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
- I. Connect wiring devices by wrapping conductor around screw terminal.
- J. Use jumbo size plates for outlets installed in masonry walls.
- K. Install galvanized steel plates on outlet boxes and junction boxes in unfurnished areas, above accessible ceilings, and on surface mounted outlets.
- L. Install identifying nameplate on all receptacles (including receptacles in

equipment furnished by others) as per Section 26 0553.

### 3.4 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes provided under Section 26 0533 to obtain mounting heights specified or as indicated on Drawings.
- B. Install wall switch 48 inches above finished floor.
- C. Install convenience receptacle 24 inches above finished floor.
- D. Install convenience receptacle 6 inches above counter.
- E. Install dimmer 48 inches above finished floor.
- F. Install telephone jack 24 inches above finished floor.
- G. Install telephone jack for wall telephone 48 inches above finished floor.

### 3.5 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Operate each wall switch with circuit energized and verify proper operation.
- C. Verify that each receptacle device is energized.
- D. Test each receptacle device for proper polarity.
- E. Test each GFCI receptacle device for proper operation.

### 3.6 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.

END OF SECTION 26 2726

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## SECTION 26 27 27

## WIRELESS WIRING DEVICES

## PART 1 – GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Wireless Wiring Devices
    - a. Wireless Occupancy/Vacancy Sensor Controls
    - b. Wireless Daylight Sensors
    - c. Wireless Controllers
- B. Related Sections:
  - 1. Section 26 0923 – Lighting Control Devices
  - 2. Section 26 2726 – Wiring Devices
  - 3. Section 26 5000 – Architectural Lighting

## 1.2 REFERENCES

- A. American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE)
  - 1. C62.41-1991 – Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
- B. ASTM International (ASTM)
  - 1. D4674 -02a Standard Test Method for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Fluorescent Lighting and Window-Filtered Daylight.
- C. International Organization for Standardization (ISO)
  - 1. 9001:2000 – Quality Management Systems.
- D. National Electrical Manufacturers Association (NEMA)
  - 1. WD1 (R2005) – General Color Requirements for Wiring Devices.
  - 2. WD6 – Dimensional Specifications
- E. Underwriters Laboratories, Inc. (UL) :
  - 1. UL20 – Standard for Safety for General-Use Snap Switches.
  - 2. UL244A – Standard for Solid-state Controls for Appliances.
  - 3. UL508 (1999) - Standard for Industrial Control Equipment.
  - 4. UL514C – Standard for Non-metallic Outlet Boxes, Flush Device Boxes, and Covers.
  - 5. UL1472 (1996) - Solid-State Dimming Controls.
- F. Federal Communications Commission (FCC) rules – Part 15: Radio Frequency Devices.

## 1.3 SYSTEM DESCRIPTION

- A. Wireless dimming system as indicated on Sheet E-302, including plug-in modules, wireless controllers, occupancy/vacancy sensors, daylight sensors and any other component required to yield a complete system

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 013300.
- 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.
- C. Shop Drawings; include:
  - 1. Manufacturer's wiring and installation information for wired devices and wall plate kits.
- D. Product Data: Catalog cut sheets with performance specifications demonstrating compliance with specified requirements.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer: Minimum 3 years experience in manufacture of wall box lighting control products.
- B. Provide factory direct technical support hotline 24 hours per day, 7 days per week.
- C. Manufacturer's Quality System: Registered to ISO 9001:2000 Quality Standard, including in-house engineering for product design activities.
- D. Wiring Devices and Wall Box Lighting Control:
  - 1. Listed and certified by UL specifically for the required loads. Provide evidence of compliance upon request.
- E. Wireless occupancy/vacancy, daylight sensors and plug-in modules shall be tested and comply with the limits for a Class B device, pursuant to part 15 of the FCC rules.
- F. Wireless occupancy/vacancy, daylight sensors and plug-in modules shall comply with Canadian ICES-003.

#### 1.6 PROJECT CONDITIONS

- A. Do not install equipment until following conditions can be maintained in spaces to receive equipment:
  - 1. Ambient temperature: 32 degrees to 104 degrees F.
  - 2. Relative humidity: Maximum 90 percent, non-condensing.
  - 3. Lighting controls must be protected from dust during installation.

#### 1.7 WARRANTY

- A. Provide manufacturer's 1 year parts warranty.

#### 1.8 WARRANTY MATERIAL SUBMITTALS

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to end user.
- B. Make new replacement parts available.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of design product: Lutron Maestro Wireless or equal system by Rako or Leviton, subject to compliance with the specified requirements of this section.
- B. All components for wireless lighting control system shall be provided by a single manufacturer to ensure compatibility.

### 2.2 GENERAL

- A. Provide dimmer, switch, table lamp dimmer, wireless controller, wireless occupancy/vacancy sensor, wireless daylight sensor and wall plate kits that are designed, tested, manufactured, warranted, and provided by a single manufacturer unless otherwise noted.
- B. Ten-year operational life while operating continually at any temperature in an ambient temperature range of 32 degrees F 104 degrees F and 90 percent non-condensing relative humidity.
- C. Designed and tested to withstand electrostatic discharges up to 15,000 V without impairment per IEC 801-2.
- D. Possess power failure memory such that if power is interrupted and subsequently returned, lights will automatically return to same levels prior to power interruption for a minimum period of 2 years.
- E. Dimmers:
  - 1. Dimmers provide full range, continuously variable control of light intensity.
  - 2. Operate at the rated capacity across the full ambient temperature range including modified capacities for ganging configurations which require the removal of fins.
  - 3. Provide Radio Frequency Interference Suppression on dimming controls.
  - 4. Utilize air gap off, activated when user selects "off" at any control to disconnect the load from line supply eliminating any leakage current.
  - 5. Design and test dimmers to withstand line-side surges without impairment to performance when subjected to surges of 6,000 volts, 200 amps per ANSI/IEEE C62.41C.
  - 6. Capable of operating at the rated capacity; this includes modified capacities for ganging configurations which require the removal of fins. Operation at rated capacity shall be possible across the full ambient temperature range, without shortening design lifetime.
  - 7. Load Specific Requirements
    - a. Incandescent Dimmers
      - 1) High end to be a minimum of 92 percent of line voltage
    - b. Magnetic Low Voltage (MLV) Transformer Dimmers & Neon-Cold Cathode
      - 1) High end to be a minimum of 92 percent of line voltage
      - 2) Contain circuitry specifically designed to control and provide symmetrical AC waveforms to the input of the MLV transformers per UL1472.
      - 3) MLV transformers to operate below rated current or temperature.
      - 4) Dimmers using back-to-back SCR construction that could fail open causing DC power to flow into magnetic low voltage loads are not



acceptable.

- c. Fluorescent Dimmers
  - 1) Direct control of fluorescent dimming ballasts up to the ballast manufacturer's specified rating.
  - 2) Provide ballasts and dimmers from a single manufacturer.
- d. Switches to be listed to UL 20, UL 508, UL1472, CSA C22.2 #14, NOM-003-SCFI

F. Wireless Devices shall:

- 1. Be capable of diagnosing system communications.
- 2. Have addresses automatically assigned to them.
- 3. Receive signals from other wireless devices and provide feedback to user.
- 4. Have ability to determine what devices have been addressed.
- 5. Determine which system components are within range of receiving radio frequency communications by providing feedback.
- 6. Work in conjunction with wireless occupancy sensors, wireless vacancy sensors, wireless daylight sensors, and wireless controllers.
- 7. Use proprietary Radio Frequency (RF) protocol.
- 8. Use RF communication in compliance with FCC Part 15.231.

G. Provide seamless faceplates with no visible means of attachment.

H. Color

- 1. Custom color to be selected by Commissioner
- 2. Color variation in same product family: Maximum  $\Delta E=1$ , CIE L\*a\*b color units.
- 3. Visible parts: Exhibit ultraviolet color stability when tested with multiple actinic light sources as defined in ASTM D4674. Provide proof of testing upon request.

### 2.3 WALL BOX SMART DIMMERS

- A. Basis of Design Product: Lutron Maestro Wireless style dimmers as defined in the wall box dimmer schedule on the project drawings, or equal system by Rako or Leviton, subject to compliance with the specified requirements of this section.
- B. Provide frequency compensation to assure dimming capability on 50 or 60 Hz lines.
- C. Provide multi-location dimming control.

### 2.4 WALL BOX SWITCHES

A. Electronic Switches

- 1. Maestro Wireless: as required to accommodate lighting; or equal system by Rako or Leviton, subject to compliance with the specified requirements of this section.

### 2.5 PLUG-IN MODULES

A. Lamp Dimmer

- 1. Basis of Design Product: Lutron Maestro MRF2-3LD, or equal system by Rako or Leviton, subject to compliance with the specified requirements of this section.
- 2. Provide dimmer capable of integrating single incandescent plug-in lamp loads with wireless sensors and controls.

- B. Plug-In Dimmers
  - 1. Basis of Design Product: Lutron Maestro MRF2-3PD-3 / MRF2-3PD-1; or equal system by Rako or Leviton, subject to compliance with the specified requirements of this section.
  - 2. Provide dimmer/switch capable of integrating up to 3 incandescent plug-in lamp loads with wireless sensors and controls.
  - 3. Standby power draw must be less than 0.5 watts.
- C. Plug-In Switching Module
  - 1. Basis of Design Product: Lutron Maestro MRF2-15APS-3 / MRF2-15APS-1; or equal system by Rako or Leviton, subject to compliance with the specified requirements of this section.
  - 2. Provide switch capable of integrating up to 3 general purpose switching loads with wireless sensors and controls.
  - 3. Standby power draw must be less than 0.5 watts.
  - 4. Relay:
    - a. Rated life of relay: Minimum 1,000,000 cycles.
    - b. Load switched in manner that prevents arcing at mechanical contacts when power is applied to load circuits.
    - c. Fully rated output continuous duty for inductive, capacitive, and resistive loads.

## 2.6 POWER INTERFACES

- A. Provide remote dimming modules as defined on project drawings.
- B. Provide high power module and dimmer from a single manufacturer.
- C. Electrical:
  - 1. Phase independent of control input.
  - 2. Dimmer to meet limited short circuit test as defined in UL 20.
  - 3. High power module listed to UL 508 for control of incandescent, magnetic low voltage, electronic low voltage, fluorescent, and neon/cold cathode loads. Provide high power modules as defined on project drawings
- D. Diagnostics and Service: Replacing power interface does not require re-programming of system or processor.

## 2.7 WIRELESS CONTROLLER

- A. Product: Lutron Pico Wireless Controller or equal system by Rako or Leviton, subject to compliance with the specified requirements of this section.
- B. Electronics:
  - 1. Communicate via radio frequency to dimmers, switches, and plug-in modules.
- C. Functionality:
  - 1. Upon button press, LEDs to immediately illuminate.
  - 2. Allow for easy reprogramming without replacing unit.
  - 3. Provide wireless remote control capable of controlling up to 9 dimmers, switches, or lamp dimmers
- D. Mounting:
  - 1. Controller shall be capable of being mounted with a car visor clip, table stand or

directly to a wall under manufacturer's screwless faceplate.

2. Provide faceplates with concealed mounting hardware.

E. Power:

1. Provide battery operated control with minimum 5-year battery life.

2.8 SENSORS

A. Wireless Ceiling Occupancy/Vacancy Sensors

1. Basis of Design Product: Lutron LRF2-OCRB-P / LRF2-VCRB-P; or equal system by Rako or Leviton, subject to compliance with the specified requirements of this section.
2. General
  - a. Up to 3 wireless occupancy/vacancy sensors can communicate to a single compatible RF receiving device (dimmer, switch) to accommodate all conditions of space utilization and all irregular work hours and habits.
3. Wireless Ceiling Sensors shall:
  - a. Have an operational lifetime of 10 years without the need to replace batteries when installed per manufacturer's instructions.
  - b. Communicate directly to compatible RF receiving devices through use of a radio frequency communications link.
  - c. Not require external power packs, power wiring, or communication wiring.
  - d. Provide a clearly visible method of indication to verify that motion is being detected during testing and that the unit is communicating to compatible RF receiving devices (dimmers and switches).
  - e. Have a multiple segmented lens, with internal grooves to eliminate dust and residue build-up.
  - f. Utilize Infrared as its sensing mechanism coupled with Lutron XCT Technology or equivalent for sensing fine motions. Signal processing technology detects fine-motion, passive infrared (PIR) signals without the need to change the sensor's sensitivity threshold.
  - g. Have optional, readily accessible, user adjustable controls for timeout, automatic/manual-on, and sensitivity.
  - h. Have the ability to be placed in test mode to verify correct coverage and operation from the face of the unit.
  - i. Have a radio frequency range of up to 60' (18.3 m) between sensor and compatible RF receiving device(s).
  - j. Turn off lighting automatically after reasonable and adjustable time delay once the last person to occupy the space vacates a room or area.
  - k. Comply with the limits for a Class B device, pursuant to part 15 of the FCC rules.
  - l. Communicate with up to 10 compatible RF receiving devices (dimmers and switches).
  - m. Be capable of turning dimmer's lighting load on to an optional locked preset level selectable by the user. Locked preset range shall be selectable on the dimmer from 1 percent to 100 percent.
4. Mounting:
  - a. Provide surface mounting bracket compatible with drywall, plaster, wood, concrete, compressed fiber ceilings.
  - b. Provide all necessary mounting hardware and instructions for both temporary and permanent mounting.
  - c. Provide temporary mounting means to allow user to check proper

- performance and relocate as needed before permanently mounting sensor. Temporary mounting method shall be designed for easy, damage-free removal.
- d. Ceiling-mount wireless occupancy/vacancy sensors using passive infrared technology shall have a customizable mask to block off unwanted viewing areas.
  - e. Sensor lens shall illuminate during test mode when motion is detected to allow installer to verify coverage prior to permanent mounting.
5. Wireless occupancy/vacancy sensor can be programmed to operate as an occupancy sensor (automatic-on and automatic-off functionality), an occupancy sensor with low light feature (automatic-on when less than 1 fc (10 lux) of ambient light available and automatic-off functionality), or a vacancy sensor (manual-on and automatic-off functionality).
  6. A vacancy-only model shall be available to meet California Title 24 Energy Efficiency Standard requirements.

#### B. Wireless Daylight Sensors

1. Basis of Design Product: Lutron LRF2-DCRB or equal system by Rako or Leviton, subject to compliance with the specified requirements of this section.
  - a) Open-loop basis for daylight sensor control scheme
  - b) Stable output over temperature from 0 degrees to 40 degrees C
  - c) Partially shielded for accurate detection of available daylight to prevent fixture lighting and horizontal light component from skewing sensor detection
  - d) Provide linear response from 0 to 10,000 foot-candles
2. Wireless Daylight Sensors shall:
  - a) Have an operational lifetime of 10 years without the need to replace batteries when installed per manufacturer's instructions.
  - b) Communicate directly to compatible RF receiving devices through use of a radio frequency communications link.
  - c) Not require external power packs, power wiring, or communication wiring.
  - d) Have the ability to be placed in test mode to verify correct operation from the face of the unit.
  - e) Have a radio frequency range of up to 18.3 meters (60 feet) between sensor and compatible RF receiving device(s).
  - f) Comply with the limits for a Class B device, pursuant to part 15 of the FCC rules.
  - g) Color: Match NEMA WD1, Section 2 White
3. Mounting:
  - a) Provide surface mounting bracket compatible with drywall, plaster, wood, concrete, compressed fiber ceilings.
  - b) Provide all necessary mounting hardware and instructions for both temporary and permanent mounting.
  - c) Provide temporary mounting means to allow user to check proper performance and relocate as needed before permanently mounting sensor. Temporary mounting method shall be designed for easy, damage-free removal.
4. Shall meet California Title 24 Energy Efficiency Standard requirements.

#### 2.9 WALL BOX ACCESSORIES

## A. Wall Plates

1. Listed to UL 514C, CSA C22.2 #42.1-00
2. Provide an adapter plate for proper device alignment and wall plate attachment.
3. Architectural style face plates: Claro Gloss, Matte Finish, Designer style face plates: Claro Satin Color as selected by the Architect. Wall plate styles and colors to be provided as defined on the project drawings and schedules

## 2.10 SOURCE QUALITY CONTROL

- A. Perform full-function testing on completed assemblies at end of line. Statistical sampling is not acceptable.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Install equipment in accordance with manufacturer's installation instructions.
- B. Provide complete installation of system in accordance with Contract Documents.
- C. Define each dimmer's load type, assign each load to a zone, and set control functions.
- D. Provide equipment at locations and in quantities indicated on drawings. Provide any additional equipment required to provide control intent.
- E. No additional wiring shall be required between the wireless occupancy/vacancy sensor and compatible RF receiving devices (dimmers, switches).
- F. It shall be the contractor's responsibility to locate and aim sensor in the correct location required for a complete and proper volumetric coverage within the range of coverage(s) of controlled areas per the manufacturer's recommendations. Rooms shall have (90) to one hundred (100) percent coverage to completely cover the controlled area to accommodate all occupancy habits of single or multiple occupants at any location within the room(s). The locations and quantities of sensors shown on the drawings are diagrammatic and indicate only the rooms that are to be provided with sensors. The contractor shall provide additional sensors if required to properly and completely cover the respective room.
- G. Contractor shall furnish all equipment, labor, system setup and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein.
- H. Proper judgment shall be exercised in executing the installation so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitation or interference of structural components. The contractor shall also provide at the owner's facility, the training necessary to familiarize the owner's personnel with the operation, use, adjustment, and problem solving diagnosis of the occupancy/vacancy sensing devices and systems.
- I. Ensure that daylight sensor placement minimizes sensors view of electric light sources; ceiling mounted and fixture-mounted daylight sensors shall not have direct view of luminaries.

## 3.2 SERVICE AND SUPPORT

- A. Startup and Programming

1. Provide factory-certified field service engineer to a site visit to ensure proper system installation and operation under following parameters:
  - a. Qualifications for factory-certified field service engineer:
    - 1) Minimum experience training in the electrical/electronic field.
    - 2) Properly trained by the equipment manufacturer on the system installed.
  - b. Make a visit upon completion of installation of lighting control system:
    - 1) Verify connection of power feeds and load circuits.
    - 2) Verify connection and location of controls.
    - 3) Obtain sign-off on system functions.
    - 4) User to be trained on system operation.
- B. Tech Support
  1. Provide factory direct technical support hotline 24 hours per day, 7 days per week.

END OF SECTION

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SECTION 26 2813

FUSES

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SUMMARY

A. General

- 1. Provide fuses in accordance with the Contract Documents.

B. Related Work in Other Sections

- 1. Panelboards Section 26 2416
- 2. Disconnect Switches Section 26 2819

1.3 STANDARDS

- A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
  - 1. UL Standard #198.
  - 2. UL Standard #977.

1.4 SUBMITTALS

- A. Provide a complete set of shop drawings to include let-through curves for each type of fuse.
- B. Submit listing of all types, sizes and quantity of fuses which will be installed including the location of each.
- C. Submit listing of all spare fuses by types, sizes and quantities, which will be furnished for placement in the respective fuse cabinets.
- D. Submit dimensioned drawings of each fuse cabinet by type and size.
- E. Short circuit current analysis is based upon Bussman fuse characteristics for let-through currents. If Reliance, Cefco or Gould-Shawmut fuses are to be utilized, it is the Electrical Contractor's responsibility to provide the appropriate fuse curves and let-through values which correspond to the Bussman values shown on the Drawings. Submit comparative chart of fuse substitutions for Commissioner and for respective



Building Department review prior to acceptance of same substitutions. Comparative chart shall include the following.

1. Cross reference of fuses to be used in place of Bussman fuse type designation indicated on the drawings or specified herein.

## PART 2 - PRODUCTS

### 2.1 APPROVED MANUFACTURERS

#### A. Fuses

1. Bussman.
2. Cefco.
3. Gould-Shawmut.
4. Or Approved Equal.

#### B. Spare Fuse Cabinet

1. By fuse supplier.

### 2.2 MATERIALS

#### A. Mains, Feeders, and Branch Circuits

##### 1. General

- a. All fuses shall be labeled as UL Class L or UL Class R, current limiting and rated for up to 200,000 amperes. Time delay Class R fuses shall be so labeled.

##### 2. Main Service and All Feeder Circuits

- a. Fuses over 600 amperes shall be UL Class L. Fuses up to 600 amperes shall be UL Class RK1 labeled Time-delay.

##### 3. Branch Circuits

- a. Unless noted otherwise on the drawings, all fuses up to 600A shall be UL Class RK5 labeled Time-delay.

4. All fuses shall be so selected as to provide a selectively coordinated system.

5. All fuses shall be of the same manufacturer.

#### B. Spares

1. Upon completion of the building, the contractor shall provide the City of New York with spare fuses as indicated below:

- a. 10 percent (minimum of 3) of each type and rating of installed fuses shall be supplied as spare.
- b. Spare fuse cabinets shall be provided to store the above spares.
- c. Spare fuse cabinets shall be provided as a minimum in the following locations:
  - 1) Each main switchgear room.
  - 2) Each major mechanical equipment room.

C. Labels

1. Paste-on labels for building standard fuses of 600A and below to read:  
"WARNING: INSTALL CLASS RK1 FUSES ONLY."

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fuses shall not be installed until equipment is ready to be energized.
- B. Provide and install fuses of proper type, voltage and ampere ratings for all fusible devices furnished under this section and all other sections of this specification.
- C. Labels
  1. Paste appropriate label within each switch, motor starter, or panelboard door or at location next to fuse clips, where fuses shall be furnished and installed by this Contractor. Fill-in, in ink blank spaces on labels for non-standard fuses with appropriate fuse data.

END OF SECTION 26 2813

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SECTION 26 2819  
DISCONNECT SWITCHES

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Disconnect switches.
- B. Fuses.
- C. Enclosures.

1.3 REFERENCES

- A. ANSI/UL 198C - High-Intensity Capacity Fuses; Current Limiting Types.
- B. ANSI/UL 198E - Class R Fuses.
- C. NEMA KS 1 - Enclosed Switches.

1.4 SUBMITTALS

- A. Submit product data under provisions of Section 26 0500, Common Work Results for Electrical.
- B. Include outline drawings with dimensions, and equipment ratings for voltage, capacity, horsepower, and short circuit.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - DISCONNECT SWITCHES

- A. Cutler Hammer.
- B. General Electric.
- C. Square D.
- D. Or approved equal.

2.2 DISCONNECT SWITCHES

- A. Fusible Switch Assemblies: NEMA KS 1; quick make, quick break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse Clips: designed to accommodate Class R fuses.
- B. Nonfusible Switch Assemblies: NEMA KS 1; Type HD; quick make, quick break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.
- C. Enclosures: NEMA KS 1; Type 1 unless otherwise indicated on Drawings.

### 2.3 MANUFACTURERS - FUSES

- A. Bussman
- B. Gould-Shawmut
- C. Littlefuse
- D. Or approved equal.

### 2.4 FUSES

- A. Fuses 600 Amperes and Less: ANSI/UL 198E, class RK 5; sized as indicated on Drawings; dual element, current limiting, time delay one-time fuse, 600 volt.
- B. Interrupting Rating: 200,000 rms amperes.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install disconnect switches where indicated on Drawings.
- B. Install fuses in fusible disconnect switches.

END OF SECTION 26 2819

SECTION 26 2823  
CIRCUIT BREAKERS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:
1. Molded-case circuit breakers (MCCBs).

## 1.3 SUBMITTALS

- A. Product Data: For circuit breakers, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
1. Current and voltage ratings.
  2. Short-circuit current ratings (interrupting and withstand, as appropriate).
  3. Include evidence of NRTL listing for series rating of installed devices.
  4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
  5. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.
- B. Shop Drawings: For circuit breakers. Include plans, elevations, sections, details, and attachments to other work.
1. Wiring Diagrams: For power wiring.
- C. Qualification Data: For qualified testing agency.
- D. Field quality-control reports.
1. Test procedures used.
  2. Test results that comply with requirements.
  3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- E. Manufacturer's field service report.
- F. Operation and Maintenance Data: For circuit breakers to include in operation and maintenance manuals. In addition to items specified in DDC General Conditions, include the following:

1. Manufacturer's written instructions for testing and adjusting circuit breakers.
2. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.

#### 1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
  1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. Source Limitations: Obtain circuit breakers, components, and accessories, within same product category, from single source from single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with NFPA 70.

#### 1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
  1. Ambient Temperature: Not less than minus 22 deg F (minus 30 deg C) and not exceeding 104 deg F (40 deg C).
- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
  1. Notify Commissioner and City of New York no fewer than seven days in advance of proposed interruption of electric service.
  2. Indicate method of providing temporary electric service.
  3. Do not proceed with interruption of electric service without Commissioner and City of New York's written permission.
  4. Comply with NFPA 70E.

#### 1.6 COORDINATION

- A. Coordinate layout and installation of circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

## PART 2 - PRODUCTS

## 2.1 MOLDED-CASE CIRCUIT BREAKERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
  - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
  - 3. Square D; a brand of Schneider Electric.
  - 4. Or Approved Equal.
- B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.
- C. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits.
- D. Current-Limiting Circuit Breakers: Frame sizes 200 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.
- E. Features and Accessories:
  - 1. Standard frame sizes, trip ratings, and number of poles.
  - 2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
  - 3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine elements and surfaces to receive circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

- A. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- B. Comply with NECA 1.

## 3.3 IDENTIFICATION

- A. Comply with requirements in Division 26 Section "Electrical Identification"



1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Acceptance Testing Preparation:
  1. Test insulation resistance for each main circuit breaker, component, connecting supply, and feeder.
  2. Test continuity of each circuit.
- D. Tests and Inspections:
  1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
  3. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Circuit breakers will be considered defective if they do not pass tests and inspections.
- F. Prepare test and inspection reports, including a certified report that identifies circuit breakers. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

### 3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 26 2823

## SECTION 26 50 00

## ARCHITECTURAL LIGHTING

## PART 1 – GENERAL

## 1.01 DESCRIPTION

- A. General: Provide architectural lighting in accordance with the Contract Documents.
- B. Work in this Section consists of Architectural Lighting, and includes but is not limited to the following:
  - 1. Interior lighting fixtures with lamps and ballasts
  - 2. Exterior lighting fixtures with lamps and ballasts, mounted to exterior building surfaces/structures
  - 3. Luminaire Schedule
- C. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections includes, but is not limited to the following:
  - 1. Drawings and general provisions of the Contract, including General and Supplementary conditions and General Requirements, Division 01 Specification Sections, apply to this Section.
  - 2. Division 26 Section "Lighting Control Devices" and "Modular Dimming Controls" for manual or programmable control systems employing low-voltage control wiring or data communication circuits.
  - 3. Division 26 Section "Wiring Devices" for manual wall-box dimmers.
  - 4. Division 26 Section "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multiple lighting relays and contactors.
  - 5. Division 26 Section "Division 26 Section "Low Voltage Electrical Power Conductors".
  - 6. Division 26 Section "Common Work Results for Electrical"

## 1.02 DEFINITIONS

- A. Fixture: The elements of a luminaire that are designed to distribute the light, and to position and protect the lamps.
- B. Luminaire: A complete lighting unit consisting of a lamp or lamps and ballasting (when applicable) together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the power supply.
- C. Lighting Unit: A fixture or an assembly of fixtures with a common support, including a pole or bracket plus mounting and support accessories.
- D. Average Life: The time after which 50 percent of the lamps fail and 50 percent of the lamps survive under normal conditions.
- E. BF: Ballast factor. Ratio of light output of a given lamp(s) operated by the subject ballast to the light output of the same lamp(s) when operated on an ANSI reference circuit.

- F. CRI: Color rendering index.
- G. CU: Coefficient of utilization.
- H. LER: Luminaire efficiency rating, which is calculated according to NEMA LE 5. This value can be estimated from photometric data using the following formula:
  - 1. LER is equal to the product of total rated lamp lumens times BF times luminaire efficiency, divided by input watts.
- I. RCR: Room cavity ratio.

### 1.03 QUALITY ASSURANCE

- A. Fixture Materials: Provide fixture parts and components that are constructed of materials most appropriate to their use or function, and that are resistant to corrosion in a marine environment and mechanical stresses encountered in the normal application and function of the fixtures.
- B. Manufacturers: Provide fixtures from manufacturers making like products for not less than three years prior to bid.
- C. Electrical Component Standard: Provide components that comply with NFPA 70 and that are listed and labeled by UL.
- D. Listing and Labeling: Provide fixtures and accessory components specified in this Section that are listed and labeled for their indicated use and installation conditions on Project.
  - 1. Special Listing and Labeling: Provide fixtures for use in damp or wet locations, underwater, and recessed in combustible construction that are specifically listed and labeled for such use. Provide fixtures for use in hazardous (classified) locations that are listed and labeled for the specific hazard.
  - 2. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
  - 3. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- E. Applicable Codes: Fixtures shall be made and installed in accordance with the current version of the National Electric Code, the Uniform Building Code, the Federal Occupational Safety & Health Act, local codes and any other applicable regulations.
- F. Measuring and Testing Equipment: Instruments for the measurement of voltage, luminaire temperature, lighting level and fixture brightness level shall be available at all times on the site.

### 1.04 BIDS & SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, unless noted otherwise.

- Contractor shall be allowed one initial submission and one resubmission to meet all specification requirements.
- B. Product Data: Fixtures, lamps, ballasts and poles or other mounting components. Arrange Product Data for fixtures in order of fixture designation. Include data on features and accessories and the following:
1. Outline drawings indicating dimensions and principal features of fixtures.
  2. Electrical Ratings and Photometric Data: Certified results of independent laboratory tests for fixtures and lamps. Provide data for the specified lamp or lamp/ballast combination.
- C. Provide data as required to demonstrate that the submitted product meets or exceeds the performance of the specified fixture. Submittal shall include information sufficient to verify equivalency.
1. Include photometric data charts: C.U., candlepower distribution and/or luminance information as necessary.
  2. Where technical charts alone cannot substantiate compliance, the submitting manufacturer may be required to provide a full photometric study of a specific project application for verification.
  3. Lamp Data: Manufacturer, ordering code and technical information.
  4. Ballast Data: Manufacturer, ordering code and technical data showing compliance with requirements.
    - a. Where a fixture manufacturer will utilize ballasts from multiple manufacturers depending on availability, technical data must indicate the minimum characteristics that will be met in all cases. In the case of system input watts, the technical data must indicate the maximum wattage that will be met in all cases.
      - i. In order to assure compliance with energy codes and to achieve calculated illumination levels, ballast factor and input watts may not vary from the specification.
      - ii. Submittal Data must include information on ballast starting type, ballast factor and input watts.
    - b. Manufacturer is responsible for confirming that the submitted ballast products work within the fixture in terms of case size and wire lead lengths.
    - c. Where remote ballasts have limitations in distance, manufacturer shall clearly indicate maximum wire lead distance and any other requirements necessary to allow the ballast mounting locations to be properly coordinated by the Contractor.
- D. Scaled shop drawings detailing nonstandard fixtures and indicating dimensions, weights, method of field assembly, components, features, and accessories. Details shall be scaled at not less than half full size.
1. Scaled shop drawings of continuous run fixtures shall indicate overall length of each run, lamp combinations used to achieve the length, and any accessory components required.
- E. Wiring diagrams detailing wiring for control system showing both factory-installed and field-installed wiring for specific system of this Project, and differentiating between factory-installed and field-installed wiring.

- F. Coordination Drawings showing fixtures mounted on, in, or above ceiling. Indicate coordination with ceiling grids and other equipment installed in vicinity.
- G. Product certificates signed by manufacturers of lighting fixtures certifying that their products comply with specified requirements.
- H. Field test reports indicating and interpreting test results specified in Part 3 of this Section.
- I. Maintenance data for fixtures to include in the operation and maintenance manual specified in Division 1.
  - 1. Data shall include warranty information, lamp and ballast life and replacement costs, as well as other fixture information required in Division 1.

#### 1.05 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall be in addition to, and run concurrent with, other warranties made under requirements of the Contract Documents.
- B. Special Warranty for Exterior Luminaire Finish: Submit a written warranty signed by manufacturer agreeing to replace external parts of lighting fixtures exhibiting a failure of finish as specified below. This warranty is in addition to, and not a limitation of, other rights and remedies specified elsewhere within the Contract Documents.
  - 1. Protection of Metal from Corrosion: Warranty against perforation or erosion of finish due to weathering.
  - 2. Color Retention: Warranty against fading, staining, and chalking due to effects of weather and solar radiation.
  - 3. Special Warranty Period: 5 years from date of Substantial Completion.
- C. LED Fixture Warranties: Warrant complete LED systems, including LEDs, drivers, and all other system components for 3 years minimum against failure, variation in color temperature beyond plus/minus 200K, and depreciation of output below 70%.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Luminaires and lighting equipment shall be delivered to the project complete, including mounting devices, lamps, and components necessary for the proper operation of the equipment.
- B. Marking: All equipment must be clearly and boldly identified as to the fixture type and, where practicable, the fixture location.
  - 1. Voltage Identification: Fixtures designed for voltages other than 110-125 volt circuits shall be clearly marked.
  - 2. Lamp Ballast Coordination: Fixtures equipped with ballasts for operation of rapid start lamps shall be plainly marked "Use Rapid Start Lamps Only." Similarly, fixtures equipped with ballasts or other components requiring use of specific types of lamps shall be plainly marked. Markings must be clear and shall be located to be readily visible to service personnel *but invisible from normal viewing angles* when lamps are in place.

- C. **Timely Purchase:** Luminaires, associated lamps and other allied equipment shall be ordered in a timely fashion and securely stored to be available to meet the project schedule.
- D. **Storage:** Contractor shall store all fixtures in locations where they will be protected against damage due to moisture, dust, extreme temperatures and/or the work of other project construction trades.

#### 1.07 EXTRA MATERIALS

- A. **Furnish extra materials** described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
  - 1. **Lamps:** 10 lamps for every 100 of each type and rating installed. Furnish at least one of each type.
  - 2. **Plastic Diffusers and Lenses:** 1 for every 100 of each type and rating installed. Furnish at least one of each type.
  - 3. **Ballasts:** 1 for every 100 of each type and rating installed. Furnish at least one of each type.
  - 4. **Globes and Guards:** 1 for every 20 of each type and rating installed. Furnish at least one of each type.
  - 5. **Parabolic Louvers and Reflector Cones:** 1 for every 100 of each type. Furnish at least one of each type.
  - 6. **Custom Luminaires:** When 10 identical custom fixtures are furnished, furnish one complete spare custom fixture as attic stock.
  - 7. **LED Modules:** 1 for every 50 of the same type, from the same production run as the installed products.
  - 8. **Tools:** Furnish manufacturer's recommended number of each specialized tool required to service and maintain the fixtures.

### PART 2 – PRODUCTS

#### 2.01 MANUFACTURERS

- A. **Available Products:** Subject to compliance with the submittal requirements of this specification, fixtures that may be incorporated into the Work include, but are not limited to, the products specified in the Lighting Fixture Schedule at end of this Section. The photometric performance of all submitted products must meet or exceed the performance of the specified fixtures where proposed.

#### 2.02 FIXTURES AND FIXTURE COMPONENTS, GENERAL

- A. **Sheet Metal Components:** Provide the required dimensional thickness of metal, plastic and composite materials so that all fixtures are rigid, stable and will resist deflection, twisting, warping under normal installation, and relamping procedures.
  - 1. All luminaire housings shall be minimum 0.84 mm cold rolled steel, unless a heavier gauge is specified or required by code.
  - 2. All aluminum extrusion housings shall be minimum 5 mm thick.
  - 3. All spun, hydro-formed or sheet aluminum reflectors shall be fabricated from # 12 aluminum sheets minimum, 1.45 mm or heavier. Material shall be 3002 alloy, 99.5 percent pure aluminum with uniform grain structure.

4. All spun aluminum housings shall be of an alloy of the 5000 series (ANSI/ASTM-B209-1977) or of an alloy that is found to have equal corrosion resistance.
- B. Joints: Provide positive, durable, means of connection at all joints as required. No hollow rivets, unless specifically approved.
  - C. Gaskets: Provide neoprene, silicone, rubber, or other appropriate gaskets, stops, and barriers where required to prevent light leak, control sound and vibration, prevent water leaks and, if pertinent, water vapor penetration.
  - D. Edges: Provide finished product with the following minimum qualities:
    1. Ground and/or burr free metal edges.
    2. Tight fitting connections, hinges, and closures.
    3. Clean neat corners, edges, trims, and frames.
  - E. Castings: All cast parts, including die-cast members, shall be of uniform quality; free from blow holes, pores, hard spots, shrinkage defects, cracks, and/or other imperfections that affect strength and appearance, or are indicative of inferior metals or alloys.
  - F. Reflecting Surfaces: Minimum reflectance as follows, except as otherwise indicated:
    1. White Surfaces: 85 percent.
    2. Specular Surfaces: 83 percent.
    3. Diffusing Specular Surfaces: 75 percent.
    4. Laminated Silver Metallic Film: 90 percent.
  - G. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or water white, annealed crystal glass, except as otherwise indicated. Greenish-tinted lenses are not acceptable. Heat resistant where required: borosilicate or Pyrex glass.
    1. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
    2. Lens Thickness: 0.125 inch (3 mm) minimum; except where greater thickness is indicated.
  - H. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit relamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position.
  - I. Fixture Support Components: Comply with Division 26 Section "Common Work Results for Electrical."
    1. Single-Stem Hangers: ½ inch (12 mm) steel tubing with swivel ball fitting and ceiling canopy. Finish same as fixture
    2. Twin-Stem Hangers: Two, ½ inch (12 mm) steel tubes with single canopy arranged to mount a single fixture. Finish same as fixture.
    3. Rod Hangers: 3/16 inch (5 mm) minimum diameter, cadmium-plated, threaded steel rod.

4. Hook Hanger: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.
- J. Track-Lighting Systems: Provide components, including track, fittings, and fixtures from same manufacturer and as recommended by manufacturer for intended use.
1. Maintain a continuity of conductors through feeds, splices, and boxes. The relative positions of live and neutral conductors must always be maintained along a continuous run so that track fittings connect into the track in a consistent manner.
  2. Install surface mounted track straight and true regardless of the ceiling contour.

### 2.03 FINISHES

- A. Manufacturer's standard, except as otherwise indicated, applied over corrosion-resistant treatment or primer, free of streaks, runs, holidays, stains, blisters, and similar defects.
2. Prior to finishing, all surfaces must be free from foreign materials such as dirt, rust, oil, polishing compounds, and mold release agents.
  3. Where necessary, surface cleaned by accepted chemical means shall receive corrosion inhibiting phosphating treatment assuring positive paint adhesion.
  4. All castings and extrusions shall be machined, sanded or similarly treated, and given minimum one coat of baked-on clear methacrylate lacquer, unless a painted finish is specified.
  5. Aluminum surfaces exposed to weather (other than anodized reflectors covered elsewhere) receive a duronodic or polyester powder paint finish as specified for corrosion resistance.
  6. Sheet steel fixture housings, iron and steel parts, which have not received phosphating treatment ("Bonderizing" or similar process) or are to be utilized in exterior applications, are to be made corrosion resistant by zinc or cadmium plating or hot-dip galvanizing.
  7. Anodized aluminum reflectors required for exterior use shall have a minimum of 0.02 mm anodizing thickness.
  8. Anodized reflectors for interior use shall have a minimum of .006mm (.25mils) anodizing thickness for clear reflectors. Specular reflectors shall have 86% to 91% reflectivity. All reflectors shall be double sealed, first in Nickel Acetate and then in Sandoz Andal sealant at a minimum of 208 deg. All Specular reflectors shall meet or exceed the specification for the Alzak process.

### 2.04 LAMPS

- A. Available Products: Lamps of the same type (such as fluorescent or HID) shall be supplied from the same manufacturer. Where a specific lamp manufacturer has been indicated in the Luminaire Schedule within this Section, lamps shall be supplied from the named manufacturer only. Provide fluorescent lamps from Osram Sylvania or Philips Lighting.
- B. Fluorescent Color Temperature and Minimum Color-Rendering Index (CRI): 3000 K and 85 CRI, except as otherwise indicated.



- C. Linear Fluorescent Lamp Life: Rated average is 40,000 hours at 3 hours per start when used on rapid start circuits.
- D. Metal Halide Color Temperature and Minimum Color-Rendering Index (CRI): 3000 K and 80 CRI, except as otherwise indicated. Environmentally Responsible Lamp Technology.
- E. Environmentally Responsible Lamp Technology: Use only fluorescent and metal halide sources that are low mercury and TCLP-compliant, except where not available in a specified lamp type.
- F. Lamp Burn-in Period: Fluorescent and metal halide lamps that are specified for dimming shall be burned-in, or run continuously in a non-dim state, for a period of 100 hours prior to dimming the lamps.
- G. Solid State Lighting / Light Emitting Diodes (LEDs):
  - 1. All individual LEDs used within a luminaire must be manufactured by a reputable LED manufacturer, such as Cree, Osram Sylvania, Nichia, Philips (Lumileds) or approved equal. LED modules shall be manufactured by Bridgelux, Philips (Fortimo) or Xicato.
  - 2. Testing: All products shall be tested by a Nationally Recognized Testing Laboratory (NRTL) in accordance with IES LM-79 testing methods and shall carry a UL, ETL or CSA label. Fixture manufacturer shall confirm in writing that the LEDs within the fixture will not exceed the maximum temperature to which the LED die was tested using IES LM-80 testing methods.
  - 3. Drive Current, Thermal Management and LED rated Life: Drivers must not over-drive the LEDs beyond LED manufacturer's recommendations and shall adhere to device manufacturer guidelines, certification programs, and test procedures for thermal management of LEDs within their fixtures. Drive current and luminaire thermal design must ensure minimum 50,000 hour rated life for the LEDs.
  - 4. Color Consistency: All LEDs from the same manufacturer, both within each luminaire and from luminaire to luminaire, must be batch-sorted for visual color and brightness consistency. All luminaires of the same type shall be supplied at the same time and shall come from the same batch. Spare luminaires shall be provided from the same batch.
  - 5. Dimming: Luminaire manufacturer must provide specific data on the means of dimming for coordination of the proper control device (specified elsewhere). Acceptable methods include electronic low voltage dimming and 0-10V 4-wire dimming protocol. Dimming must provide uniform, smooth, full-range dimming. LEDs must maintain consistent brightness and color throughout the dimming range.
  - 6. Technology Upgrades: Supply the newest LED technologies that are available for the specified products when the orders are released, as long as there are no increases in input watts or cost.
  - 7. Warranty: See Part 1.5 C. above for the warranty requirement for LED luminaire systems.

## 2.05 LAMP HOLDERS

- A. Screw Base: Screw base sockets for incandescent and metallic vapor lamps shall be of heavy duty heat resistant porcelain with spring center contacts and

plated screw shells. For ceramic metal halide lamps with electronic ballasts, provide minimum 4 KV pulse rated lampholders.

- B. Fluorescent Sockets: Fluorescent lamp sockets operating with an open circuit voltage in excess of 300 volts shall be of the safety type that open the supply circuit when the lamp is removed from the sockets.

## 2.06 BALLASTS

- A. Fluorescent Ballasts: Electronic integrated circuit, solid-state, full-light-output, energy-efficient programmed rapid start type, unless otherwise indicated; must be compatible with lamps and lamp combinations to which connected.
1. Underwriters Laboratories (UL) listed, Class P, Type 1 – Outdoor and CSA Certified where applicable.
  2. Operating Voltage: Match system voltage, or universal voltage, from a 50/60 Hz input source, and sustained variations of  $\pm 10$  percent (voltage & frequency) with no damage to the ballasts.
  3. Ballast shall be programmed rapid start, unless otherwise indicated. Ballast starting parameters shall be consistent with lamp manufacturer's recommendations and shall provide full rated lamp life under normal operating conditions.
  4. Ballast shall have audible noise rating of Class "A" except as otherwise indicated.
  5. Voltage: Match connected circuits.
  6. Lamp Flicker: Less than 3 percent.
  7. Minimum Power Factor: 95 percent.
  8. Total Harmonic Distortion (THD) of Ballast Current: 10% or less, 20% or less for dimming.
  9. Ballast shall tolerate sustained open and short circuit output conditions without damage.
  10. Lamp Current Crest Factor: 1.7 or less in accordance with ANSI C82.11-1993
  11. Minimum Ballast Factor (relative light output): 88 percent for T8 lamps, 98 percent for T5 compact fluorescent, 97 percent for all T4 compact fluorescent, and 100 percent for linear T5/T5HO.
  12. Minimum Starting Temperature: 0° F, -18° C, 50° F, 10° C for dimming.
  13. Ballast shall provide transient immunity as recommended by ANSI C62.42-1991.
  14. Lamp-ballast connection method shall not reduce normal rated life of lamps.
  15. Ballast shall comply with all applicable local, state, and federal efficiency standards.
  16. Ballasts shall comply with FCC Title 47 CFR Part 18 non-consumer RFI/EMI standards.
  17. Ballasts shall be Reduction of Hazardous Substances (RoHS) compliant.
  18. Ballasts shall not have any PCBs.
  19. Ballasts for lamps of 5/8" diameter and smaller, including ballasts for CFL lamps, shall incorporate auto resetting lamp shut down circuitry for end of lamp life protection.
  20. Low-Temperature Fluorescent Ballasts: Comply with above requirements; ballasts for high output lamps shall be electronic, ballasts for other lamps may be Class P electromagnetic type. Starting temperature shall be minus 20 deg. F or colder, or the minimum available depending on lamp type.
  21. Dimming Ballasts: Electronic rapid start type providing smooth dimming over a minimum range from 100 down to 1 percent measured relative light output,

for architectural dimming, and 100 down to 10 percent for other applications (unless otherwise specified). Listed for use with specific fluorescent dimming system provided.

22. Remote Ballasts: Where ballasts must be mounted remotely from fixtures, provide locations that fall within the manufacturer's recommended distance limitations.
23. Manufacturer shall have been manufacturing electronic ballasts for at least 3 years.
24. The manufacturer shall provide a five-year written warranty against defects in material or workmanship, including replacement.

B. HID Ballasts: Include the following features, except as otherwise indicated.

1. Electronic HID Ballasts: Provide electronic ballasts for ceramic metal halide lamps that include the following features:
  - a. Integrated electronic ballast, igniter and capacitor, microprocessor based.
  - b. EISA compliant with the following minimum ballast efficiencies:
    - i. 92 percent for wattages greater than 250 watts.
    - ii. 90 percent for wattages 250 watts or less.
  - c. Operating Voltage: Match system voltage, or universal voltage.
  - d. Minimum Power Factor: 95 percent.
  - e. Total Harmonic Distortion (THD) of Ballast Current: 15 percent or less.
  - f. Sound Rating: Class "A".
  - g. Lamp Current Crest Factor: Less than 1.3.
  - h. Ballast shall be equipped with a "Turn Off" safety function to prevent excessive ballast pulsing under conditions of: failed lamp, no lamp, or other sustained abnormal conditions such as rectification or glow mode.
  - i. Ballast shall have not more than +/- 0.5 percent variation in output power with a +/-10 percent variation in input line voltage.
  - j. The lamp manufacturer shall approve or warrant the specified lamps for use on the designated Electronic Metal Halide ballast.
  - k. Ballast shall comply with FCC Title 47 CFR Part 18C for non-consumer limits for EMI and RFI.
  - l. Safety: UL Outdoor Type 1, suitable for recessed use, thermally and transient protected.
  - m. Minimum ballast temperature: -15°C/+5°F
  - n. Remote Ballasts: Where ballasts must be mounted remotely from fixtures, provide locations that fall within the manufacturer's recommended distance limitations.
  - o. The manufacturer shall provide a five-year written warranty against defects in material or workmanship, including replacement.

## 2.07 TRANSFORMERS

A. Suitability: Transformers shall be of the best quality and meet the following requirements:

1. Where possible transformers shall have an integral line voltage switch.
2. All transformers shall be locally fused or have secondary side breakers.
3. Provide adequate ventilation to meet code and manufacturers requirements concerning temperature rise.
4. Remote transformer quantities and sizes for low voltage lighting shall be coordinated/ determined according to final loads based on final lighting fixtures and control zones specified for the project. Each fixture shall require a separate

feed from the transformer to the lighting fixture. Feed lengths to lighting fixtures within a zone shall be uniform in length, or each run sized accordingly to provide a uniform voltage to all fixtures; excess wiring shall not be coiled. Acceptable voltage supplied at the fixture shall not exceed the rated lamp voltage nor drop more than 5% below that rated voltage. All wiring from transformers to low voltage lighting fixtures shall be sized to compensate for voltage drop, which will be determined by the load, voltage, and length of run, based on the final coordinated accessible location of the remote transformer. All transformers shall be suitable for dimming their primary side, via a remote lighting control system.

## 2.08 LED DRIVERS

- A. Provide line voltage LED product, where available, to eliminate the need for drivers. If the LED product is not available as line voltage, then the LED drivers shall meet the following requirements:
1. Drivers shall have a minimum efficiency of 85%
  2. Starting Temperature: -40° C
  3. Input Voltage: capable of 120 to 480 ( $\pm 10\%$ ) volt, single phase or as required by the site
  4. Power supplies can be UL Class I or II output
  5. Surge Protection: The system must survive 250 repetitive strikes of "C Low" (C Low – 6kV/1.2 x 50  $\mu$ s, 10kA/8 x 20  $\mu$ s) waveforms at 1 minute intervals with less than 10% degradation in clamping voltage. "C Low" waveforms are as defined in IEEE/ASNI C62.41.2-2002, Scenario 1 Location Category C
  6. Drivers shall have a Power Factor (PF) of:  $\geq 0.90$
  7. Drivers shall have a Total Harmonic Distortion (THD) of:  $\leq 20\%$
  8. Drivers shall comply with FCC 47 cfr part 18 non-consumer RFI/EMI standards
  9. Drivers shall be Reduction of Hazardous Substances (RoHS) compliant (see <http://www.rohs.eu/english/index.html>)

## PART 3 – EXECUTION

### 3.01 INSTALLATION

- A. Set units plumb, square, and level with ceiling and walls, and secure according to manufacturer's written instructions and approved Shop Drawings. Support fixtures according to requirements of Division 26 Section "Common Work Results for Electrical."
1. Verify that wallwasher housings have been properly installed to allow for reflector orientation to wash the intended wall.
- B. Support for Recessed and Semi-recessed Grid-Type Fluorescent Fixtures: Units may be supported from suspended ceiling support system, unless prohibited by local codes. No movement permitted after installation. Install ceiling support system rods or wires at a minimum of 4 rods or wires for each fixture, located not more than 6 inches (150 mm) from fixture corners.
1. Install support clips for recessed fixtures, securely fastened to ceiling grid members, at or near each fixture corner.
  2. Fixtures Smaller than Ceiling Grid: For fixtures that normally mount at the ceiling grid on at least one side, install a minimum of 4 rods or wires for each fixture and locate at corner of ceiling grid where fixture is located. Provide

- additional ceiling grid to frame out fixture. Do not support fixtures by ceiling acoustical panels.
3. Fixtures of Sizes Less than Ceiling Grid: Center in acoustical panel. Support fixtures independently with at least two  $\frac{3}{4}$  inch (20 mm) metal channels spanning and secured to ceiling tees.
- C. Support for Suspended Fixtures: Brace pendants and rods over 48 inches (1200 mm) long to limit swinging. Support stem-mounted, single-unit, suspended fluorescent fixtures with twin-stem hangers. For continuous rows, use tubing or stem for wiring at one point and tubing or rod or cable for suspension for each unit length of chassis, including one at each end.
1. Provide all mounting components required for installation, including hickey, stud-extensions, ball-aligners, canopies and stems.
  2. Provide stems on pendant fixtures of the correct length to uniformly maintain the fixture heights shown on the drawings or established in the field.
- D. Air Handling Fixtures: Install with dampers closed.
- E. Fixture Attachment with Adjustable Features or Aiming: Attach fixtures and supports to allow aiming for indicated light distribution.
- F. Lamping: Where specific lamp designations are not indicated, lamp units according to manufacturer's instructions.
- G. Installation Sequence: Install fixture mounting frames, plaster rings, etc. prior to the trim assembly, which shall not be installed until the project is "broom-clean." Where the fixture location or construction does not permit sequential installation, all reflectors, lenses, flanges, and other visible surfaces shall be carefully protected.

### 3.02 WIRING

- A. Minimum Standards: All wiring shall comply with the following standards:
1. All wiring within lighting fixtures or from the splice with the building wiring shall be as specified under Division 26 Section "Low Voltage Electrical Power Conductors and Cables."
  2. Wiring between fluorescent lamp holders and associated operating and starting equipment shall be of similar or heavier gauge than the leads furnished with the approved ballasts.
  3. Wire leads to the receptacle or connector of any side prong incandescent lamp or any "cool-beam" lamp, or any lamp 200 watts or over shall be SF-2 (silicone rubber insulated) stranded wire.
  4. Wiring within fixture construction is to be concealed, except where the fixture design or mounting dictates otherwise.
  5. Joints in wiring within lighting fixtures and connections of the fixture wiring to the wiring of the building shall be as specified under Division 26 Section "Low Voltage Electrical Power Conductors and Cables" with special attention to paragraphs relating to high amperage, low voltage conditions.
  6. Wiring channels and wireways shall be free from projections and rough or sharp edges throughout, and at all points or edges over which conductors must pass and may be subject to injury or wear.
  7. Insulated bushings shall be installed at points of entrance and exit of flexible wiring.

### 3.03 GROUNDING

- A. Ground fixtures and metal poles according to Division 26 Section "Grounding and Bonding for Electrical Systems." Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values.
  - 1. Poles: Install 3-m driven ground rod at each pole.
  - 2. Nonmetallic Poles: Ground metallic components of lighting unit and foundations. Connect fixtures to grounding system with No. 6 AWG conductor.

### 3.04 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- B. Give advance notice of dates and times for field tests.
- C. Provide instruments to make and record test results.
- D. Tests: Verify normal operation of each fixture after fixtures have been installed and circuits have been energized with normal power source.
- E. Replace or repair malfunctioning fixtures and components, then retest. Repeat procedure until all units operate properly.
- F. Report results of tests.
- G. Replace fixtures that show evidence of corrosion during Project warranty period.

### 3.05 CLEANING AND ADJUSTING

- A. Clean Fixtures after installation: Remove all protective strippable coatings, dust, finger marks, paint spots, and any materials deleterious to the appearance or functioning of the fixtures. Use methods and materials recommended by manufacturer. Abrasive cleaners are not permitted.
- B. Focusing and Adjustment: After installation of all lighting fixtures, finishes and furnishings has been completed, provide personnel, ladders or lifts, spare lamps, and any other equipment necessary to expeditiously focus all lighting. Focusing shall be performed *after dark*, unless all visible daylight can be screened out of the focusing area, and shall take place under supervision of the Commissioner. All work shall be performed in accordance with union rules, should they be in force, and applicable codes. Where pre-aiming diagrams or angles have been provided by the Commissioner, this information shall be considered preliminary aiming, which is being provided to help expedite the process of night focusing. Pre-aiming by the Contractor does not eliminate the requirement for final focusing after dark.
  - 1. Aim all adjustable lighting fixtures according to instructions.
  - 2. Program preset dimming system "scene" lighting levels, where applicable.

- C. Lighting interface with dimming control systems: Where lighting is being controlled on a dimming system (specified elsewhere), the system shall be up and running at the time of final focusing so that the Commissioner may provide input on dimmed preset levels. Technical personnel from the dimming manufacturer shall be on hand at final focusing to adjust the light levels and coordinate with the Commissioner.

### 3.06 FINAL INSPECTION

- A. Upon completion of the installation, lighting equipment must be in first class operating order and free from defects in condition or finish.
1. At time of final inspection, all fixtures and equipment must be installed and lamped with *new* lamps and be complete with all lenses, diffusers, reflectors, side panels, louvers, or other necessary components. Lamps that have been operating longer than the following time limits or that have already burned out must be replaced with new lamps prior to final completion.
    - a. Halogen Incandescent lamps: 200 hours (approximately 25 eight-hour days).
    - b. Non-halogen Incandescent lamps: 75 hours (approximately 9 eight-hour days).
    - c. Fluorescent lamps: 1000 hours (approximately 125 eight-hour days).
    - d. HID lamps: 1000 hours (approximately 125 eight-hour days).
  2. Fixtures shall be completely clean and free from finger marks, dust, plaster, or paint spots.
  3. Any reflectors, lenses, diffusers, side panels, or other parts damaged prior to the final inspection shall be replaced.
  4. Exterior poles, bollards, bases, and other exterior fixtures shall be painted to match factory color where finish has been scratched or damaged.
  5. Housings shall be rigidly installed and adjusted to a neat flush fit with the ceiling.
  6. *No light leaks* shall be permitted at the ceiling line or from any visible part or joint.

Section continues on following pages.

L1	Suspended linear direct dimmable fluorescent with staggered lamps and frosted lens, 5" wide- 21' nominal length	(5) FO32/830/XPS/ECO (4') + (1) FO25/830/XPS/ECO (3')	AXIS LIGHTING "Beam 6 – Pendant T8" B6D-F-S21-T8-0-1S-W-120-D-1- (SUSPENSION) Suspended linear fixture with staggered single T8 lamps, overlap brackets for standard 5" stagger, and frosted lens. Provide (2) two-lamp (FO32) Lutron Hi-Lume 3D, 1.17 ballast factor, (1) one-lamp (FO32) Hi-Lume 3D, 1.17 ballast factor, and (1) one-lamp (FO25) Hi-Lume 3D, 1.17 ballast factor. Architect to select cable or stem suspension. Bottom of fixture to align with wood ceiling at 13'-4" – suspended from deck at 14'-4". Architect to verify white finish.
	Location: Multipurpose room (104) – pop-ups in ceiling	(Allow 227.7W per fixture)	Or approved equal
L1-EM	Same as Type L1 with two integral emergency battery packs	Same	AXIS LIGHTING "Beam 6 – Pendant T8" B6D-F-S21-T8-0-1S-W-120-D-1- (SUSPENSION) – B50 Same as L1 with two Bodine B50 battery pack ballasts, 1350 lumens each to operate the 4' lamps located one lamp from each end of the 21' fixture. Refer to electrical drawing for battery pack location. Submit shop drawings showing location of indicator lights and test switches
			Or approved equal
L2	Recessed linear direct dimmable fluorescent with staggered lamps and frosted lens, 5" wide- 21' nominal length	(5) FO32/830/XPS/ECO (4') + (1) FO25/830/XPS/ECO (3')	AXIS LIGHTING "Beam 6 – Recessed T8" B6R-F-FL-S21-T8-1S-W-120-D-1- Recessed linear fixture with staggered single T8 lamps, overlap brackets for standard 5" stagger, frosted lens, and recessed in gyp board ceiling. Provide (2) two-lamp (FO32) Lutron Hi-Lume 3D, 1.17 ballast factor, (1) one-lamp (FO32) Hi-Lume 3D, 1.17 ballast factor, and (1) one-lamp (FO25) Hi-Lume 3D, 1.17 ballast factor. Architect to verify white finish.
	Location: Multipurpose room (104) –in low-soffit ceiling	(Allow 227.7W per fixture)	Or approved equal



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| L3  | Wall mounted linear fluorescent with aiming capability, mounted above diffusion material<br><br>Location: Skylight area         | (1)<br>FO32/830/XPS/ECO<br>(4')<br><br>(Allow 31W per 4' lamp)   | ELLIPTIPAR<br>"Style 301"<br>F301-A32-S00-1-0Y-0<br>Small concealed wall mounted linear fluorescent fixture with (1) T8 lamp, remote ballast with ballast factor of .88, "L" shaped brackets for wall mounting, bright anodized reflector, modified to comply with NYC code, UL listed or CSA certified for US.<br>Mounted above architectural diffusion layer at skylight. Architect to coordinate access.<br><br>Or approved equal |
| L4  | Dimmable T8 fluorescent asymmetric fixture- 2' length<br><br>Location: Multipurpose room (104) - concealed in cove above soffit | (1)<br>FO17/830/XPS/ECO<br>(2')<br><br>(Allow for 22.9W per one lamp ballast)  | LITECONTROL<br>"Cove-30"<br>CC-AI-30-1-2-T8-CWM----Lutron Hi-Lume-(PREWIRING)-120<br>8" wide and 3-1/8"H asymmetric indirect concealed cove with one-lamp cross-section concealed by architectural soffit. Provide (1) one lamp Lutron Hi-Lume 3D, 1.00 ballast factor<br><br>Or approved equal  |
| L4A | Dimmable T8 fluorescent asymmetric fixture- 20' length<br><br>Location: Multipurpose room (104)- concealed in cove above soffit | (5)<br>FO32/830/XPS/ECO-<br>(4')<br><br>Input: 168.1W<br>(Allow for 66.5W per two lamp ballast and 35.1w per one lamp ballast) | LITECONTROL<br>"Cove-30"<br>CC-AI-30-5-20-T8-CWM----Lutron Hi-Lume-(PREWIRING)-120<br>8" wide and 3-1/8"H asymmetric indirect concealed cove with one-lamp cross-section concealed by architectural soffit. Provide (2) two lamp Lutron Hi-Lume 3D, 1.00 ballast factor and (1) one lamp Lutron Hi-Lume 3D, 1.00 ballast factor<br><br>Or approved equal   |

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| L4B | Dimmable T8 fluorescent asymmetric fixture- 8' length<br><br>Location: Multipurpose room (104) - concealed in cove above soffit          | (2)<br>FO32/830/XPS/ECO<br>(4')<br><br>(Allow for 66.5W per two lamp ballast) | LITECONTROL<br>"Cove-30"<br>CC-AI-30-2-8-T8-CWM----Lutron Hi-Lume-(PREWIRING)-120<br>8" wide and 3-1/8"H asymmetric indirect concealed cove with one-lamp cross-section concealed by architectural soffit. Provide (1) two lamp Lutron Hi-Lume 3D, 1.00 ballast factor<br><br>Or approved equal   |
| L5  | Surface mounted single circuit track- 19'-6" + 23'-0" nominal lengths<br><br>Location: Multipurpose room (104)- slot in soffit           | (Allow 30W/lf)  | LIGHTING SERVICES INC<br>Surface mounted track<br>313XX Series<br>Lengths field cuttable 120v surface mounted one circuit track with end feed, joiners and endcap. Provide all components for a complete working track system. Architect to coordinate mounting requirements and confirm white finish. Confirm feed location based on mounting requirements. Control track at north and south sides of partition separately.<br><br>Or approved equal |
| L6  | Dimmable LED accent track head with on/off switch, 4" diameter cylindrical housing<br><br>Location: Multipurpose room (104)- slot soffit | 25W LED 3000K<br>96+CRI 650 lm<br>package<br><br>Input: N/A                   | LIGHTING SERVICES INC<br>"LumeLEX Series" with Xicato Artist Series LED Module<br>LX2044-C-3-M4-00-W/AA995+ AA998<br>Xicato 25W LED module, 40° beam spread; Integral electronic driver with 50°x50° spread lens, and beam softener lens. Architect to confirm white finish<br><br>Or approved equal  |

L7	Dimmable recessed adjustable double halogen lamp fixture with a trim and a 9.45"x5.30" aperture  Location: Multipurpose room (104)- wood mid-level ceiling	(2) 37MR16/IR/NFL25/C  Input: 80W	RSA C02-N-037M16-E-I-R-B-B Recessed double 37 watt MR16 lamp fixture for new construction, a recessing depth of 6.7", and retractable yoke option with 380x45 degree adjustment. Control fixtures on north and south side of partition separately. Architect to confirm black interior finish and black trim finish  Or approved equal
L8	Not Used		
L9	Recessed compact fluorescent down light with 6" aperture  Location: Interior Court (102), Entry (103), Hall (109), and Hallway	CF32DT/E/830/ECO  (Allow 36W)	LIGHTOLIER "Calculite" 8031 CCDW/S6132BU 6" aperture recessed horizontally oriented 32W CFL downlight with a clear diffuse iridescence free reflector and a white flange (please confirm trim finish), and a ballast with 1.0 ballast factor  Or approved equal
L9-EM	Same as Type L9 with integral emergency battery pack	Same	LIGHTOLIER "Calculite" 8031 CCDW/S6132BU-FAEM4E Provide Emergency Battery Kit producing 600 lumens  Or approved equal
L9A	Recessed compact fluorescent wallwasher with 6" aperture  Location: Hallway, Hall (109), Ladies (107)	CF32DT/E/830/ECO  (Allow 36W)	LIGHTOLIER 8081 CCDW/S6132BU 6" aperture recessed horizontally oriented 32W CFL wallwasher with a clear diffuse iridescence free reflector and a white flange (please confirm trim finish), and a ballast with 1.0 ballast factor  Or approved equal

L9A-EM	Same as Type L9A with integral emergency battery pack	Same	LIGHTOLIER 8081 CCDW/S6132BU-FAEM4E Provide Emergency Battery Kit producing 600 lumens  Or approved equal
L10	Not Used		
L11	Wall mounted linear fluorescent asymmetric ceiling washer with 8.7" projection, 4' fixture  Location: Interior court (102), Youth reading space (101)	FO32/830/XPS/ECO  Input: 37 per 4' length (Allow 74W for two fixtures and 111W for three fixtures)	SPI LIGHTING "Echo Velocity 3.5 – Forward Throw" EIW10151-1F32-120V-(FINISH)-DCL Wall mounted, asymmetric profile linear fixture with (1) T8 lamp and with dust cover lens, locks in desired orientation, provide a parallel instant start T8 ballast with 1.18 ballast factor, such as the Universal B232IUNVHEH-A for two lamps or B332IUNVHEH-A for three lamps. Architect to confirm finish. Note: Bottom of fixture must be mounted higher than 6'-8" AFF to comply with ADA. L11 series and LX1 series to be similar fixture from the same manufacturer  Or approved equal
L11A	Wall mounted linear fluorescent asymmetric ceiling washer with 8.7" projection, 3' fixture  Location: Interior court (102),	FO32/830/XPS/ECO  Input: 36W	SPI LIGHTING "Echo Velocity 3.5 – Forward Throw" EIW10150-1F25-120V-(FINISH)-DCL Wall mounted, asymmetric profile linear fixture with (1) T8 lamp and with dust cover lens, locks in desired orientation, provide a one lamp instant start T8 ballast with 1.09 ballast factor, Architect to confirm finish. Note: Bottom of fixture must be mounted higher than 6'-8" AFF to comply with ADA. L11 series and LX1 series to be similar fixture from the same manufacturer  Or approved equal

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| L12  | Dimmable recessed LED down light with 4" aperture<br><br>Location: Multipurpose Room (104)   | 27.1W LED 3000K<br>80+CRI 1300 lm package<br><br>Input: 27.1W | KURT VERSEN<br>A1135 Series<br>4" aperture recessed 27.1W downlight with Xicato LED module, 1300 lumen package, and medium beam spread. Reflector and trim finished TBD.<br><br>Or approved equal  |
| L13  | Recessed perimeter linear fluorescent wall washer with white reflector 5'-0" and 5'-6" lengths<br><br>Location: Men's (106) and Ladies (107) | (2)<br>FO25/830/XPS/ECO<br><br>Input: 47W                     | MARK ARCHITECTURAL LIGHTING<br>"Perimeter Plus"<br>PPL-(LENGTH)-WH-1T8-EBPR-120<br>9"wide aperture; seamless reflector to illuminate full length of wall, standard 9" staggering of T8 lamps to eliminate socket shadows; telescoping housing and lamp sections; provide (1) two lamp program rapid start ballast with a 0.94 ballast factor, 47 input watts at 120 volts; Two lengths required 5'-0" and 5'-6", both use the same lamp configuration<br><br>Or approved equal                       |
| L13A | Recessed perimeter linear fluorescent wallwasher with white reflector 10'-6" length<br><br>Location: Ladies (107)                            | (3)<br>FO32/830/XPS/ECO<br><br>Input: 96W                     | MARK ARCHITECTURAL LIGHTING<br>"Perimeter Plus"<br>PPL-10.5'-WH-1T8-EBPR-120<br>9"wide aperture; seamless reflector to illuminate full length of wall, standard 9" staggering of T8 lamps to eliminate socket shadows; telescoping housing and lamp sections; provide (1) two lamp program rapid start ballast with a 0.99 ballast factor, 64 input watts at 120 volts and (1) one lamp program rapid start ballast with a 1.00 ballast factor, 32 input watts at 120 volts<br><br>Or approved equal |
| L14  | Recessed two lamp fluorescent 2'x2' direct high efficiency lensed fixture<br><br>Location: Storage/Pantry (108)                              | (2) F017/830/XPS/ECO<br><br>Input: 31W                        | LITHONIA<br>"2RT8S"<br>2RT8S-2-17-MVOLT-BINP-L835HT8<br>Regressed refractive system with linear faceted reflector, and high efficiency lens.<br>Note: Fixture supplied with lamps<br><br>Or approved equal   |

L15	Recessed compact fluorescent down light with 6" aperture, 42 watt	CF42DT/E/830/ECO  (Allow 48W)	GOTHAM AF 1/42TRT LD 6WR 120 6" aperture recessed horizontally oriented 42W CFL downlight with a clear diffuse reflector and a white flange, and a ballast with 1.0 ballast factor Architect to confirm trim finish
	Location: Youth reading space (101)		Or approved equal
L16	Planter LED uplight	8.3w LED 3100K 80+CRI  (Allow 8.3W)	BK LIGHTING "Micro Nite Star" (MATERIAL)-MN-LED-e16NFL- (FINISH)-12-11-B-360SL Wet location fixture with 3-3/4"H and 1- 5/8" diameter head, 1-5/8" stem and 8w LED 3100k with 25° beam spread, with soft focus lens, honeycomb baffle, and rotational knuckle mounting system. Architect to confirm finish and material. Note: Mounting TBD
	Location: planter at Interior Court (102)		Or approved equal
L17	Recessed two lamp fluorescent direct/indirect 2'x2'	(2) PL-L 50W/830/4P/RS  (Allow 118W)	LIGHTOLIER (Salvage and reuse existing fixtures) "Paraplug II" PP-S-2-G-8-F-W-2-FT50-120-CT 8 cell white parabolic louver with white prismatic lens overlay and a ballast with 1.10 ballast factor
	Location: Youth reading space (101)		Or approved equal
L17- EM	Same as L17 with emergency battery pack	Same	LIGHTOLIER "Paraplug II" PP or PY-S-2-G-8-F-W-2-FT50-120- CT- B50 with Bodine B50 emergency battery kit, housing to comply with NYC code
			Or approved equal

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| L17A | Recessed three lamp fluorescent direct/indirect 2'x2'<br><br>Location: Computer Room (105)   | (3)<br>FO17/830/XPS/ECO<br>(2')<br><br>Input: 57W                                | LIGHTOLIER<br>"Paraplus II"<br>PY-S-2-G-8-F-W-3-17-120-NL<br>8 cell white parabolic louver with white prismatic lens overlay; meets NYC code. Provide (1) 3-lamp ballast such as Sylvania QHE3X32T8/UNV-PSH-HT with 1.18 ballast factor<br><br>Or approved equal  |
| L18  | Pendant mounted 3' diameter LED cylinder with white frosted acrylic diffuser<br><br>Location: Youth reading space (101)                  | Warm White LED<br><br>Input: 77W   | DELRAY LIGHTING<br>6703-S-WW-1-BDIM-W<br>Three foot diameter (3') donut cylinder with silver finish aluminum outer housing and white frosted acrylic inner diffuser, dimmable. 6' adjustable cable standard, suspension height TBD<br><br>Or approved equal   |
| L19  | Surface mounted undercabinet linear fluorescent task light with a clear acrylic lateral ribbed lens                                      | FO32/830/XPS/ECO<br><br>Input: 37 per 4' length                                  | LEGION LIGHTING<br>316-132-ACL-EBO<br>Four foot length, with solid front, white finish, switching TBD<br><br>Or approved equal  |
| LX1  | Wall mounted linear fluorescent ceiling washer with 8.7" projection<br><br>Location: Above Outdoor storage (110), Outside of entry (109) | FO32/830/XPS/ECO<br><br>(Allow 74W for two fixtures and 111W for three fixtures) | SPI LIGHTING<br>"Echo Velocity 3.5 – Forward Throw"<br>EEW10243-1F32-120-(FINISH)<br>Wall mounted, asymmetric profile linear fixture with (1) T8 lamp, locks in desired orientation, UL wet location listed, provide a parallel instant start T8 ballast with 1.18 ballast factor, such as the Universal B232IUNVHEH-A or B332IUNVHEH-A and wire two or three fixtures together (2 or 3 lamp ballast). Architect to confirm finish.<br>Note: Bottom of fixture must be mounted higher than 6'-8" AFF to comply with ADA. L11 series and LX1 series to be similar fixture from the same manufacturer.<br><br>Or approved equal |

LX1A	Wall mounted linear fluorescent wall washer with 8.7" projection  Location: Mounted on Outdoor storage (110)- Signage	FO32/830/XPS/ECO  (Allow 74W for two fixtures)	SPI LIGHTING "Echo Velocity 3.5 – Forward Throw" EEW10263-1F32-120-(FINISH) Wall mounted, asymmetric profile linear fixture with (1) T8 lamp, locks in desired orientation, UL wet location listed, provide a parallel instant start T8 ballast with 1.18 ballast factor, such as the Universal B232IUNVHEH-A and wire two fixtures together (2 lamp ballast). Architect to confirm finish. Note: Bottom of fixture must be mounted higher than 6'-8" AFF to comply with ADA. L11 series and LX1 series to be similar fixture from the same manufacturer
			Or approved equal
LX2	Wall mounted LED downlight  Location: Outside of entry (109) – within skylight	8.3w LED 3100K 80+CRI  (Allow 8.3W)	BK LIGHTING "Micro Nite Star" (MATERIAL)-MN-LED-e16NFL-(FINISH)-12-11-B-360SL Wet location fixture with 3-3/4"H and 1-5/8" diameter head, 1-5/8" stem and 8w LED 3100k with 25° beam spread, with soft focus lens, honeycomb baffle, and rotational knuckle mounting system, remote transformer required. Architect to confirm finish and material. Note: Mounting and transformer location TBD.
			Or approved equal
LX2-EM	Same as Type LX2 with emergency lighting inverter	Same	BK LIGHTING "Micro Nite Star" (MATERIAL)-MN-LED-e16NFL-(FINISH)-12-11-B-360SL- with Bodine ELI-S20 – Note: Mounting, transformer and inverter locations TBD. Verify temperature rating and location
			Or approved equal
LX3	Not Used		



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|--------|--|---|--|
| LX4    | Recessed compact fluorescent lensed down light with 6" aperture<br><br>Location: Entry (103), Canopy               | CF32DT/E/830/ECO<br><br>(Allow 36W)               | LIGHTOLIER<br>"Calculite"<br>8091CCDW/S6132BU<br>6" aperture recessed horizontally oriented lensed 32W CFL downlight rated for wet location with a clear diffuse iridescence free reflector and a white, and a provide a 0° temperature ballast with 1.0 ballast factor<br>Architect to confirm trim finish.<br><br>Or approved equal  |
| LX4-EM | Same as Type LX4 with emergency battery pack   |   | LIGHTOLIER<br>"Calculite"<br>8091CCDW/S6132BU-FAEM4E<br>Provide Emergency Battery Kit producing 600 lumens<br><br>Or approved equal  |
| LX5    | Ceramic metal halide floodlight with 3" diameter for flagpole illumination<br><br>Location: Roof - around flagpole | CDM 35W/830 E26<br>PAR20 FL 30D<br><br>Input: 44W | B-K LIGHTING, INC<br>"Everest Series"<br>EV-0-(FINISH)-9-A-360SL with PM3-SM-H35E-2-120<br>PAR 20 CMH floodlight with clear lens, 45 degree cap, aluminum construction, and 360SL mounting system. ETL listed with completely sealed optical compartment, clear tempered glass lens, and tamper-proof design. Provide with Universal Power Module 3, surface mounted with a 35W MH electronic ballast.<br>Architect to confirm finish<br><br>Or approved equal |

END OF SECTION 26 5000

## SECTION 28 00 00

## ELECTRONIC SAFETY AND SECURITY

## PART 1 - GENERAL

## 1.1 SCOPE-OF-WORK

- A. In accordance with the contract documents provide all material, labor, equipment, and services necessary to furnish, install, commission, and warrant the Security System. The intent of this document is to provide the design specification for providing Access Control, Panic Alarm and IP Video Surveillance system. The system shall be tied into and expand on the existing system. System servers and storage are located inside the ground floor Mechanical room. Refer to drawing SE-901 for master schedule of equipment including needed rack equipment and cameras/access control equipment. The systems shall include, but not be limited to, the following functions and capabilities:
1. New NVR for use with Genetec Enterprise system to integrate with the existing system.
  2. Network enabled card access control and alarm system with capability for remote programming, control and maintenance of the system.
  3. A direct data interface to the CCTV sub-system CPU to provide automatic camera scene display on alarm/event reporting (Alarm call-up).
  4. Network (IP) surveillance cameras – indoor and outdoor – connecting to the new NVR.
- B. The system equipment and installation shall comply with all provisions and requirements of this specification as well as any and all applicable national, state, and local codes and standards.
- C. The entire security system shall include, but not be limited to the following:
1. Access Control System and Intrusion / Panic Alarm System
    - a. Intelligent Access Control Panels
    - b. Card Readers
    - c. Power supplies
    - d. Battery backup
    - e. Alarm and egress equipment
    - f. Panic alarm
  2. Network (IP) Surveillance Cameras System
    - a. Network (IP) cameras, lenses, housings, and mounts

- b. Network Video Recorders and additional storage
  - c. Network Switches with Power over Ethernet
  - d. LAN and WAN interface
  - e. UPS System
  - f. Patch Panel
- D. The Access Control System specified herein shall be able to support all of the features delineated in these specifications and drawings. The Security Contractor shall ensure that all of the support requirements for final utilization of the system with the entire delineated features incumbent to the system specified can be supported.

## 1.2 CODES, PERMITS, AND INSPECTION

- A. All security systems work shall meet or exceed the latest requirements of all national, state, county, municipal, and other authorities exercising jurisdiction over the security systems work and the project.
- B. Any portion of the security systems work that is not subject to the requirements of an electric code published by a specific authority having jurisdiction shall be governed by the National Electrical Code and other applicable sections of the National Fire Code, as published by the National Fire Protection Association.
- C. Installation procedures, methods, and conditions shall comply with the latest requirements of the Federal Occupational Safety and Health Administration (OSHA).

## 1.3 DEFINITIONS AND INTERPRETATIONS

- A. Regardless of their usage in codes or other industry standards, certain words as used in the drawings or specifications for the security systems work, shall be understood to have the specific meanings as ascribed to them in the following list:
  - 1. "Circuit" – Any specific run of circuitry
  - 2. "Circuitry" – Any security systems work which consists of wires, cables, raceways, and/or specialty wiring method assemblies taken all together complete with associated junction boxes, pull boxes, outlet boxes, joints, couplings, splices, and connections except where limited to a lesser meaning by specific description.
  - 3. "Security Systems Closet" – The enclosed area or room specifically designated for the routing, termination, and/or cross connecting of security systems cable (i.e. riser cable) to other security systems cable and/or equipment.
  - 4. "Security Systems Wiring" – see "Circuitry"
  - 5. "Security Systems Work" – All security systems work as defined by the security systems drawings and specifications.
  - 6. "Concealed" (as applied to circuitry) – Covered completely by building materials,

except for penetrations (by boxes and fittings) to a level flush with the surface as necessitated by functional or specified accessibility requirements.

7. "Exposed" (as applied to circuitry) – Not covered in any way by building materials.
  8. "Normal Work Conditions" – Locations within building confines that are not damp, wet, or hazardous and are not used for air handling.
  9. "Patch Panel" – A system of terminal blocks, patch cords, and backboards that facilitate administration of cross-connect fields for moves and rearrangements.
  10. "Raceway" – Any pipe, duct, extended enclosure or conduit (as specified for a particular system) which is used to contain wires, and which is of such nature as to require that the wires be installed by a "pulling in" procedure.
  11. "Standard" (as applied to wiring devices) – Not of a separately designated individual type.
  12. "Subject to Mechanical Damage" – Exposed within seven feet of the floor in mechanical rooms, manufacturing spaces, vehicular spaces, or other spaces where heavy items are moved around or rigged as a common practice or as required for replacement purposes.
  13. "Riser" – Shall refer to the portion of the installation that transmits between building floors (or between security system rooms). Also referred to as backbone cabling.
  14. "Wiring" – see "Circuitry"
  15. "Workstation" or "Station" – the location where users of security systems equipment is provided.
- B. Where the word "conduit" is used without specific reference to type, it shall be understood to mean "raceway".
- C. Reference to "U.L. (Materials Construction) Standards" shall mean the "Standards for Safety" published by Underwriters Laboratories, Inc.
- D. Reference to "NEMA Standards" shall mean the "Approved Standards" published by the National Electrical Manufacturers Association.
- E. Reference to "ANSI Standards" shall mean the standards published by the American National Standards Institute.
- F. Reference to "IEEE Standards" shall mean the standards published by the Institute of Electrical and Electronics Engineers.
- G. Reference to "BICIS Standards" shall mean the guidelines and methods published by the Building Industries Consulting Service International.
- H. Items and installation methods as described in the drawings and specifications for security systems work are to be used only under normal work conditions as hereinafter described unless there are specific notations to the contrary.

- I. Except where modified by a specific notation to the contrary, it shall be understood that the indication and/or description of any security systems item in the drawings and specifications for security systems work carries with it the instruction to furnish, install and connect the item as part of the security systems work regardless of whether or not this instruction is explicitly stated.
- J. No exclusion from or limitation in, the symbolism used on the drawings for security systems work or the language used in the specifications for security systems work shall be interpreted as a reason for omitting the appurtenances or accessories necessary to complete any required system or item of equipment.
- K. The drawings for security systems work utilize symbols and schematic diagrams that have no dimensional significance. The security systems work shall, therefore, be installed to fulfill the diagrammatic intent expressed on the security systems drawings, field layouts, and shop drawings of all trades.
- L. Certain details appear on the drawings for security systems work that are specified with regard to the dimensioning and positioning of the security systems work. These are intended only for general information purposes. They do not obviate field coordination for individual items of the indicated work.
- M. The use of the words in the singular shall not be considered as limiting where other indications denote that more than one item is referred to.
- N. Ratings of devices, materials, and equipment specified without reference to specific performance criteria shall be understood to be nominal or nameplate ratings established by means of industry standard procedures.
- O. It is the intent of the drawings and specifications to provide a complete operating security system. All security systems work necessary to provide such a system shall be performed. Any discrepancies shall be brought to the Commissioner's attention.
- P. The work called for under this Contract shall be carried on simultaneously with the work of other trades and City of New York functions in such a manner as to not delay the overall progress of the construction project.
- Q. When directed by the Commissioner, the Security Contractor shall, without charge, make reasonable, minor modifications in the layout of hardware as needed to prevent conflict with work of the trades, City of New York functions, or for proper execution of the work.
- R. The Security Contractor shall be responsible for providing adequate protection of equipment before and after installation.
- S. The Security Contractor is responsible for clean-up of debris on a daily basis and cost of cleanup is the Security Contractor unless otherwise specified.
- T. Include in the security systems work all necessary supervision and issuing of all coordination information to any other trades who are supplying work to accommodate the security systems installations.

- U. For items of equipment which are to be installed but not purchased as part of the security systems work, the security systems work shall include:
  - a. The coordination of their delivery.
  - b. Their unloading from delivery trucks driven in to any point on the property line at grade level.
  - c. Their safe handling and field storage up to the time of permanent placement in the project.
  - d. The correction of any damage, defacement, or corrosion to which they may have been subjected.
  - e. Their field make-up as may be necessary for their proper operation.
  - f. Their mounting in place including the purchase and installation of all dunnage, supporting members, and fastenings as necessary to adapt them to architectural and structural conditions.
- V. Included shall be the purchase and installation of any substitute lugs or other wiring terminations as may be necessary to adapt their terminals to the wiring as called for and to the connection methods set forth in these specifications.

#### 1.4 QUALITY ASSURANCE

- A. All equipment and materials for permanent installation shall be the products of recognized manufacturers and shall be new.
- B. New equipment and materials shall:
  - 1. Be Underwriters Laboratories, Inc. (U.L.) listed and approved where specifically called for or where normally subject to such U.L. labeling and/or listing services.
  - 2. Be clearly labeled identifying make, model, and manufacturer.
  - 3. Be without blemish or defect.
  - 4. Be in accordance with the latest applicable standards.
  - 5. Be products that meet with the acceptance of the agency inspecting the security systems work.
- C. Manufacturers Recommendations: Where installation procedures of any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

#### 1.5 SUBMITTALS

- A. Prior to purchasing any equipment or materials, a list of their manufacturers shall be submitted for review.
- B. Prior to purchasing any equipment or material, the following shall be submitted for review:
  - 1. Shop drawings as required for a complete explanation and description of all items and equipment, and submitted per DDC General Conditions.
  - 2. Catalog information of all items and equipment per DDC General Conditions.
  - 3. Samples upon request from the Commissioner.
  - 3. Documents will not be accepted for review unless:
    - a. They include complete information pertaining to appurtenances and accessories.
    - b. They are submitted as a package where they pertain to related items.
    - c. They are properly marked with specific service or function, and intended location of use within the project.
    - d. They are clearly identified or highlighted to indicate all items that were applicable.
    - e. They indicate the project name and address along with the Contractor's name, address, and phone number.

#### 1.6 SERVICE AND OPERATING INSTRUCTIONS

- A. Service and Operating Manuals
- B. Include in the security systems work the issuing of operating instructions for the following specialized equipment:
  - 1. All electronic equipment provided or installed as part of the security systems work.
- C. The issuing of operating instructions shall consist of supplying qualified personnel to demonstrate the operation of specialized equipment. The issuing of operating instructions shall also consist of supplying of all original operating and maintenance instruction manuals.
- D. The issuing of operating instructions shall include the submission of the name, address, and telephone number of the manufacturer's representative and service company for each item of equipment so that service and spare parts can be readily obtained.
- E. After all final tests and adjustments have been completed, fully instruct the Commissioner in all details of operation for equipment installed.
- F. Furnish required number of manuals, in bound form containing data covering capacities, maintenance, and operation of all equipment and apparatus. Operating instruction shall

cover all phases of control and include the following:

1. Performance Criteria: For transmission and other equipment as requested.
  2. List of Spares: Recommended for normal service requirements.
  3. Parts List: Identifying the various parts of the equipment for repair and replacement.
  4. Instruction Books may be standard booklets but shall be clearly marked to indicate applicable equipment.
  5. Wiring diagrams: Generalized diagrams are not acceptable; submittal shall be specifically prepared for this Project.
- G. Prior to start of testing, submit for approval methodology for factory and site testing including sample data sheets.
- H. Prior to start of instruction, submit a syllabus and course outline for approval. Coordinate with the City of New York for scheduling.
- I. System Documentation: the following items will be submitted by the contractor prior to final acceptance of the system:
1. Operating Manual (3 copies)
  2. Maintenance Manual (3 copies)
  3. Project Progress reports (30%, 70%, 90% completion)
  4. Computer system documentation (3 copies). Include configuration diagrams, as-built capacities, and field expansion capabilities, operating system and software configuration, and fully documented application software manual.

#### 1.7 DESCRIPTION OF STANDARD SECURITY SYSTEMS ASSEMBLIES

- A. It shall be understood that where cable composition quantities are described (i.e., 4 pair, 12 strand fiber, etc.), these shall be tested, operating conductors in one sheath. Additional conductors may be needed in the sheath to guard against failures and ensure the required numbers are all operating. It is the Contractor's responsibility to determine the number of additional conductors necessary, if any, to ensure the required number of operating conductors is adhered to.
- B. The Contractor shall be responsible for insuring that the installation of all equipment be performed in accordance with manufacturers specifications. The necessity of special conditions required by a particular manufacturer shall be brought to the attention of the Commissioner prior to installation of any equipment in the area concerned.

#### 1.8 WORK OF OTHER TRADES

- A. Security Contractor must review all documents and installation performed by others and become familiar with the work of others. Work not specifically addressed in this specification or in the plans, if required for a complete and operating system, shall be the



- responsibility of the Security Contractor. No changes to others scope of work will be issued.
- B. General/Electrical contractor shall supply 110 VAC electrical power for all security equipment at locations shown on plans.
  - C. General contractor shall be responsible to coordinate the extension/cross-connect of POTS lines used for alarm signal transmission to off-site central station, from the Telco Demarcation to the system interface. The Security Contractor shall be responsible for programming, testing, and maintaining of the central station transmission hardware utilizing these lines where required by specification and system operation.
  - D. Unless otherwise specified, all network transmission lines will be provided by general contractor. The Security Contractor shall be responsible for interfacing network transmission lines with the security system where required by specifications and system operations. (CAT-6A cables for network cameras and Video Intercom to be provided by the low voltage contractor).
  - E. The Security Contractor shall be responsible for coordinating interface of all fail-safe electronic door hardware with the fire system where required by code.
  - F. The Security Contractor shall be responsible for interfacing of all Emergency Lockdown devices with the access control and UL rated intrusion alarm systems, and for coordinating their tie-in to the fire alarm system.
  - G. In cases where electronic door hardware that is interfaced, controlled, or monitored by the security system is supplied and/or installed by others, the Security Contractor shall be responsible for interfacing door hardware with the security an, access control, and fire system where required by code, specifications or system operations.
  - H. The Security Contractor shall be responsible for coordinating the security system's space requirements, location, and layout at areas shown on plans.

## 1.9 REFERENCES

- A. ANSI / NFPA 70-National Electrical Code
- B. NYC Building Code (and Reference Standards)

## 1.10 CONTRACTOR QUALIFICATIONS

- A. The contractor for the security / access control system specified shall have the following qualifications and bidders shall submit documentary evidence of same:
  - 1. A local office with staff of factory trained technicians who are qualified to provide instructions, routine and emergency maintenance and repair on all portions of the system. Staff shall be assigned on an on-call basis.
  - 2. A track record of successful completion of like projects for a minimum of three (3) years. Provide evidence of experience in successful design, installation and operation of integrated Access Control Systems and computer based security

systems similar to the systems and sub-systems specified.

3. **Technical / Management Capability:** The Contractor shall demonstrate technical qualifications and management capability to supply, install, test, and support the installation and testing of the security / access control system proposed.
4. **Support and Services:** The Contractor shall guarantee the availability of system hardware / software support, services, repairs, and spare parts for up to one (1) year following system acceptance. The contractor shall indicate the number of its trained service technicians in the project area knowledgeable in the support / repair of the systems proposed.

#### 1.11 WARRANTY

- A. Security Contractor shall warrant the installed system to be free of defects of materials and workmanship for a period of one year following system acceptance by the Commissioner. System acceptance shall commence when all parts, components, sub-systems and systems have been tested, shown to be working in accordance with the specification, and approved by the Commissioner.
- B. During the warranty period provide twenty-four (24) hour service seven days per week.
- C. Service shall be rendered within twelve (12) hours of notification of problem and four (4) hours of notification of problem for critical equipment and/or software repair.
- D. Servicing to include the following:
  1. Emergency Guarantee Service (24 hours/day, 7 days/week).
  2. Replacement of defective parts and components as required.
  3. Service by a factory trained service representative of systems manufacturer.
  4. Service of all system programming.
  5. Incorporation of hardware / software fixes available to improve system reliability as they become available. Any equipment replacement and wiring changes required are to be performed only after approval by authorized representative.

#### 1.12 INSTRUCTION

- A. Security Contractor shall instruct a minimum of six (6) operators for system operation. The instruction shall be provided by a representative of the Security Contractor.
  1. Provide each operator with complete, printed operating instructions and brief subsystem description in manual or handbook form.
  2. Sessions shall be scheduled to suit the Commissioner's requirements, and may be scheduled at any time from the award of the contract to the end of the guarantee period at the Commissioner's request.

#### 1.13 DELIVERY, STORAGE, AND HANDLING

- A. Costs of all shipping to the site, and of all unusual storage requirements, shall be borne by the Security Contractor. It shall be the responsibility of the contractor to make appropriate arrangements and to coordinate with authorized personnel at the site for the proper acceptance, handling, protection, and storage of equipment so delivered.
- B. Movement of material, either at the time of delivery or subsequently, shall be the sole responsibility of the contractor. All costs associated with this movement shall also be the responsibility of the Contractor.
- C. The security Contractor shall be responsible for the safe storage of all equipment. In the event of equipment damage or disappearance from the site, the Contractor shall bear full responsibility and all costs associated with equipment replacement at no additional cost to the City of New York.

## PART 2 - PRODUCTS

### 2.1 GENERAL PROVISIONS

- A. All equipment and materials for permanent installation shall be the products of recognized manufacturers and shall be new. The bidder shall supply the latest model available at the time of bidding of each piece of equipment.
- B. All new components must be compatible with the existing security equipment and each other for a complete system.

### 2.2 APPROVED MANUFACTURERS

See drawings for part numbers. No substitutes unless otherwise noted.

- A. Access Control System: Sielox
- B. Card Reader: HID
- C. Burglar Alarm Panel: Ademco/Honeywell
- D. Motion Detector: Honeywell or equal to noted Basis of Design part number.
- E. Break Glass Sensor: Honeywell or equal to noted Basis of Design part number.
- F. Door Contact: GE or equal to noted Basis of Design part number.
- G. Motion Detector: Honeywell or equal to noted Basis of Design part number.
- H. Network Video Recorder: Axis
- I. Structured Wiring Box: Elk (or approved equal)
- J. Fixed Network Cameras (outdoor and indoor): Axis
- K. Patch Panel: Ortronics or equal to noted Basis of Design part number.
- L. UPS: APC or equal to noted Basis of Design part number.

- M. Lock Power Supplies: Altronix or equal to noted Basis of Design part number.

## 2.3 GENERAL PROVISIONS

- A. All enclosures for equipment supplied under this specification shall be protected against tampering by being equipped with tamper switches or triggering mechanisms electronically compatible with the alarm system.
- B. Internal wiring or equipment shall be such that tamper switches and triggering mechanisms are not bypassed even though the detector itself is operating in the "access" mode.
- C. All controls which affect the sensitivity of the units shall be located inside of the tamper resistant enclosures.
- D. Key locks or key operated switches used to protect enclosures shall have UL listed locking cylinders.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Installation shall include the delivery, storage, setting in place, fastening to the building structure, interconnection of components, alignment, adjustment and all other work, whether or not expressly specified which is necessary to result in a tested and operational system.
- B. All installation practices shall be in accordance with, but not limited to, the specifications and drawings. Installation shall be performed in accordance with the applicable standards, requirements, and recommendations of the National Electrical Code and any authorities having jurisdiction.
- C. During the installation and up to the date of final acceptance, the Contractor shall be under obligation to protect his finished and unfinished work against damage or loss. In the event of such damage or loss, he shall replace or repair such work at no cost to the City of New York.
- D. All equipment shall be firmly secured in place unless requirements of portability dictate otherwise. Fastenings and supports shall be adequate to support their loads with a safety factor of at least three.
- E. All boxes, equipment, etc. shall be plumb and square. The Contractor must take such precautions that are necessary to prevent and guard against electromagnetic and electrostatic hum, to supply adequate ventilation and to install the equipment to provide reasonable safety for the operator.
- F. In the installation of equipment and cables, considerations shall be given not only to operational efficiency, but also to overall aesthetic factors.
- G. Electrical work should be installed to specifications. All security wiring shall be concealed or in conduit as noted.
- H. Supply and install all fittings and accessories, whether or not they are specified, required

for proper, safe, and reliable operation of the system.

- I. No exposed equipment shall be installed without the Commissioner's approval of design, finish, and mounting detail.

### 3.2 CABLE INSTALLATION

- A. All circuits shall be protected to avoid interruption of service due to short-circuiting or other conditions which might adversely affect the connected devices. Each individual signaling circuit shall be classified as a circuit pair.
- B. All cabling run in the ceiling cavities shall be neatly strapped, dressed, and adequately supported every 8-10'. Cable installation shall conform to good engineering practices and to the standards of the most current National Electrical Code.
- C. Cables shall be terminated with the proper connector required for the associated operation of the equipment to which it is connected. Screw terminal blocks shall be furnished for all cables which interface with racks, cabinets, consoles, or equipment modules. Wire shall be interfaced with screw terminal blocks through the use of spade lugs installed on the cable with an installation tool specifically recommended by the manufacturer of the lug. Evidence of the installation of cables and wires without the appropriate connectors, spade lugs and tools shall be sufficient cause for rejection of the work and the re-installation of the cables or wires.
- D. Where the cables or wires require soldering, the soldering shall be done using rosin core solder and controlled temperature soldering equipment. Evidence of solder joints not made with rosin core solder or temperature controlled tools shall be sufficient cause for rejection of the work and the re-soldering of all connections.
- E. Every cable or wire shall be labeled or coded at each end. Each terminal of each field terminal strip shall be permanently labeled or coded to show the zone, instrument or item served. Terminal blocks shall be numbered by circuit pairs such as 1-25, 26-50, etc.
- F. All cables within a rack, console, or junction box shall be grouped according to the signals being carried to reduce signal contamination. Separate groups should be formed for the following:
  1. Power cables
  2. Video cables and audio cables carrying less than 2.0 volts peak to peak.
  3. Audio cables carrying signals between 2.0 volts and 24 volts, peak to peak, security monitoring cables carrying signal less than 5 volts, peak to peak.
  4. Audio cables carrying signals above 24 volts peak to peak and local control system cables carrying less than 24 volts current limited to less than 5 amps.
- G. Coaxial cables shall be run in continuous lengths except for terminations. No splices shall be permitted in any conduit run.

- H. All conduit support shall be as required.
- I. Where shielded conductors enter a panel or enclosure, and where power wiring exists, provision shall be made to provide physical isolation of signal and power conductors. Install sleeve on shield grounds in panels. Conduit connections shall be made to assure no interaction between power and signal circuits.
- J. Electrical self stripping tap and pigtail connectors shall be tin plated brass "U" element contact.

### 3.3 IDENTIFICATION AND TAGGING

- A. All cables, wires, terminal blocks, and terminals shall be identified by labels, tags, or other permanent markings.
- B. All markings shall clearly indicate the function, source, and destination of all cabling, wiring, and terminals.

### 3.4 GROUNDING

#### A. General

1. A single system ground point shall be established for the system. This shall consist of a single grounding point to which all grounds are connected.
2. The system ground shall be located in the base of the security equipment racks or panels. It shall consist of copper bar sufficient in size to accommodate the required grounds.
3. The system ground is to be connected to the local ground bus by conductors which have not more than 0.1 ohm total resistance. Under no conditions will AC neutral either in a power panel or in receptacle outlets be used for a reference ground.
4. The Contractor shall provide RF shielding and RF filtering for all systems and components to ensure no interaction with potential RF systems in proximity to the site.

### 3.5 FINISH

- A. Equipment finishes shall be manufacturers standard unless otherwise noted in the specifications. All finishes, custom or standard, shall be submitted to the Architect/Engineer for approval prior to fabrication.

### 3.6 EQUIPMENT IDENTIFICATION

- A. Each major piece of equipment shall be provided with a permanent identification tag containing the following information:
  1. Name of Manufacturer
  2. Equipment Description
  3. Serial Number and Model Number

4. Voltage and Current Rating
5. UL or other regulatory approvals.

### 3.7 GENERAL

- A. When the Security contractor has completed his own system tests and when the system record documents, including drawings, operation and maintenance manuals, are complete, the Commissioner is to be notified that the system fulfills the specifications and is ready for acceptance testing.
- B. Security Contractor shall provide documentation describing total system test methodology for review and approval prior to commencement of system test
- C. Contractor shall provide sufficient personnel to conduct testing.
- D. Contractor shall provide any required equipment for testing.
- E. Approved English software packages shall be entered into the security computer systems and be debugged. The contractor shall have the responsibility of documenting and entering the initial database into the system. The Contractor shall provide any necessary forms with instruction to the City of New York to fill in the required database information. The database shall then be reviewed by the contractor and entered into the system. A copy of the documents and recorded database information shall be placed on a diskette for use at a later date. Prior to full operation, a complete demonstration of the computer real time functions shall be performed in the presence of the City of New York or his representatives. A printed validation log shall be provided as proof of operation for each software application. In addition, a point utilization report shall be furnished listing each point, the programs using each point as an input or output and the programs initiated by each point.
- F. Upon satisfactory on-line operation of the system software, the entire installation including all sub-systems shall be inspected. The Contractor shall perform all tests, furnish all equipment and consumable supplies necessary, and perform any work required to establish performance levels for the system in accordance to the specifications. These tests shall include:
  1. Document all measured values and control settings for the system.
  2. Check all inputs and outputs for performance compliance.
  3. Demonstrate response times of card readers under maximum load
  4. Function of all remote sensors for proper operation and wiring. No simulations shall be allowed.
  5. Check of control and monitoring functions from all originations and control points.
  6. Establish tentative normal settings for all systems controls.
  7. Demonstrate power up and power down procedures

8. Demonstrate fail safe locks release during fire alarm event
  9. Demonstrate Emergency Lockdown event activation and deactivation.
  10. Review all surveillance cameras field of view, focus and general video quality
  11. All test to be documented by the Contractor and the City of New York or his representatives.
- G. A punch list for correction of defective components or operational failures shall be provided to the Contractor subsequent to the testing procedure.
- H. Contractor shall correct any deficiencies noted on the punch list and take corrective action to assure proper operation. Once complete re-testing of the system will be scheduled.
- I. Final Acceptance Testing
1. Contractor shall verify that all record documentation is complete.
  2. The operation of all system and equipment shall be demonstrated by the contractor to comply with the contract documents.
  3. Both subjective and objective tests may be required by the City of New York and the Architect to determine compliance with the specifications.
  4. Upon completion of the re-inspection, the Architect/Engineer shall either accept the system as being substantially complete or advise the contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary the procedure may be repeated.
  5. The system shall be accepted as complete when all base contract work has been completed and all remedial work is performed and all documentation is complete, accurate and accepted and the City of New Yorks representatives have received the proper specified training.
  6. Complete logs of the testing procedures shall be retained by the Contractor and upon final acceptance these logs records shall be submitted to the City of New York.
- 3.8 FIELD TESTING
- A. Complete field testing shall be performed on all sub-systems. Each individual function shall be tested and proven correct for a minimum of two times with not less than two months interval between tests.
- B. Contractor to provide the services of a fully qualified technician to perform field testing. Testing shall be performed after the system is fully adjusted and operating in accordance to the specification requirements.

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## SECTION 28 31 00

## FIRE ALARM SYSTEM

## PART 1- GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. The requirements of the Contract Documents including the General and Supplementary General Condition and Division 1 – General Requirements shall apply to the work of this section.

## 1.2 SCOPE

The work covered by this Section of the Specification shall include all labor, equipment, materials and services to furnish and install a complete fire alarm system of the zoned, automatic and manual, coded type. It shall be complete with all necessary hardware, software and memory specifically tailored for this installation. It shall be possible to permanently modify the software on site by using a plug-in programmer. The system shall consist of, but not be limited to, the following:

- A. Fire alarm control panel/system:
  - 1. To be fully addressable and allow for coding of all individual pull stations, smoke detectors (code 10-2), heat detectors, duct detectors, water flow switches (code 10-1), and tamper switches.
  - 2. Provide spare contacts for 20% expansion capacity.
  - 3. FACP/system shall be capable of closed circuit wiring for master coded systems.
- B. Addressable manual fire alarm stations.
- C. Addressable area smoke detectors.
- D. Addressable duct smoke detectors for supply fans over 2,000cfm (air handling systems shutdown control).
- E. Audible notification appliances; multi-tone horn (at panel), horn/strobe combination devices.
- F. Visual notification appliances; strobes.
- G. Central station alarm connection control.
- H. Emergency battery packs.
- I. Elevator recall operation

## 1.3 APPLICABLE CODES AND STANDARDS

- A. All equipment shall be UL listed for its intended use.
- B. NFPA Standards 72
- C. City of New York Electrical Code and authorities having jurisdiction.
- D. New York City Fire Department, Bureau of Electrical Control and Building Codes of City of New York.

#### 1.4 CENTRAL STATION

- A. The Fire Alarm Control Panel shall be connected to a Central Monitoring Station via two dedicated phones lines. The provider of the monitoring service shall be an approved NYFD Central Station Monitoring firm.
- B. Provide necessary devices as required to allow for the FACP to communicate with the Central Monitoring Station.

#### 1.5 RELATED DOCUMENTS

- A. Secure permits and approvals prior to installation.
- B. Prior to commencement and after completion of work notify Commissioner.

#### 1.6 RELATED WORK

- A. The Contractor shall coordinate work in this Section with all related trades. Work and/or equipment provided in other Sections and related to the fire alarm system shall include, but not be limited to:
  - 1. Duct smoke detectors shall be furnished, wired and connected by the electrical contractor. The HVAC contractor shall furnish necessary duct opening to install the duct smoke detectors.
  - 2. Air handling system fan control circuits and status contacts to be furnished by the HVAC control equipment.
  - 3. Raceways and wiring.

#### 1.7 SUBMITTALS

- A. Provide list of all types of equipment and components provided.
- B. Provide manufacturer's printed product data, catalog cuts and description of any special installation procedures.
- C. Provide samples of various items when requested.
- D. Provide shop drawings as follows:
  - 1. Drawing of the fire alarm control panel.
  - 2. Single line riser diagram showing all equipment and type, number and size of all conductors.

#### 1.8 WARRANTY

- A. Manufacturer shall guarantee the system equipment for a period of one (1) year from date of final acceptance of the system.
- B. The contractor shall guarantee all wiring and raceways to be free from inherent mechanical or electrical defects for one (1) year from date of final acceptance of the system.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURER

- A. Fire Alarm System shall be as manufactured by Edwards Systems Technology.
- B. The catalog numbers used are those of Edwards Systems Technology (EST), and constitute the type and quality of equipment to be furnished.

### 2.2 CIRCUITING GUIDELINES

- A. Each addressable loop shall be circuited as shown on the drawings but device loading is not to exceed 80% of loop capacity in order to leave for space for future devices. The loop shall have Class B operation.
- B. Where it is necessary to interface conventional initiating devices provide intelligent input modules to supervise Class B zone wiring.
- C. For conventional zone annunciation at the control panel zones shall be as shown on the zoning schedule, but shall be typically as follows:
  - 1. Manual Fire Alarm Stations: Provide one (1) alarm zone for each pull station.
  - 2. Area Smoke Detectors: Provide one (1) alarm zone for each smoke detector.
  - 3. Duct Smoke Detectors at HVAC Air Handling Units: Provide one (1) alarm zone for each air handling unit.
  - 4. Provide one (1) alarm zone for each of the following special areas/equipment:
    - a. Each electrical room.
    - b. Each mechanical equipment room.
    - c. Each elevator machine room.
- D. Each of the following types of alarm notification appliances shall be circuited as shown on the drawings but shall be typically as follows:
  - 1. Audible Signals: Provide one (1) notification appliance circuit for up to fifteen (15) audible alarm devices.
  - 2. Visual Signals: Provide one (1) notification appliance circuit for up to ten (10) strobes (15/75) candela per circuit.
- E. Each of the following types of remote equipment associated with the fire alarm system shall be provided with a form 'C' control relay contact as shown on the drawings, but shall be typically as follows:
  - 1. HVAC Fan Systems: Provide one (1) shutdown control relay contact for each HVAC fan system.
  - 2. HVAC Supply Fans: Provide one (1) shutdown control relay contact for each HVAC supply fan.
  - 3. HVAC Return Fans: Provide one (1) shutdown control relay contact for each HVAC return fan.
  - 4. HVAC Exhaust Systems: Provide one (1) shutdown control relay contact for each HVAC exhaust fan.

### 2.3 FIRE ALARM SYSTEM SEQUENCE OF OPERATION

- A. The system shall identify any off normal condition and log each condition into the system database as an event.
  - 1. The system shall automatically display on the control panel Liquid Crystal Display the first event of the highest priority by type. The priorities and types shall be alarm, supervisory, trouble, and monitor.
  - 2. The system shall have a Queue operation, and shall not require event acknowledgment by the system operator. The system shall have a labeled color coded indicator for each type of event; alarm - red, supervisory - yellow, trouble - yellow, monitor - green. When an unseen event exists for a given type, the indicator shall flash. When all events of a given type have been displayed, the indicator shall change from flashing to steady.
  - 3. For each event, the display shall include the current time, the total number of events, the type of event, the time the event occurred and up to a 40 character custom user description.
  - 4. The user shall be able to review each event by simply selecting scrolling keys (up-down) for each event type.
  - 5. New alarm, supervisory, or trouble events shall sound an silenceable audible signal at the control panel.
- B. Operation of any alarm initiating device shall automatically:
  - 1. Update the control/display as described above.
  - 2. Sound all audible alarm signals throughout the building
  - 3. Turn on all strobe lights throughout the building.
  - 4. Turn on a red alarm zone LED at the fire alarm control panel.
  - 5. Operate the alarm relay contacts to initiate the transmission of an alarm to a central station agency via leased telephone lines.
  - 6. Operate control relay contacts to shutdown all HVAC units serving.
  - 7. Operate control relay contacts to shut down all supply and return dampers.
- C. The entire fire alarm system wiring shall be electrically supervised to automatically detect and report trouble conditions to the fire alarm control panel. Any opens, grounds or disarrangement of system wiring and shorts across alarm bell/strobe wiring shall automatically:
  - 1. Update the control/display as described above.
  - 2. Operate the supervisory relay contacts to initiate the transmission of an alarm to a central station via leased telephone lines.

### 2.4 EQUIPMENT

- A. Fire Alarm Control Panel
  - 1. The fire alarm control panel is existing manufactured by Edwards Systems Technology (EST), EST2.
  - 2. New fire alarm devices shall be connected to the existing fire alarm panel.

3. This contractor shall verify in fields if existing fire alarm panel has adequate capacity for the additional, devices and provide additional modules if required.
4. The existing fire alarm panel shall be re-programmed.

## B. COMPONENTS

### 1. Intelligent Devices -- General

- a) Each remote device shall have a microprocessor with non-volatile memory to support its functionality and serviceability. Each device shall store as required for its functionality the following data: device serial number, device address, device type, personality code, date of manufacture, hours in use, number of alarms and troubles, time and date of last alarm, amount of environmental compensation left/used, last maintenance date, job/project number, current detector sensitivity values, diagnostic information (trouble codes) and algorithms required to process sensor data and perform communications with the loop controller.
- b) Each device shall be capable of electronic addressing, either automatically or application programmed assigned, to support physical/electrical mapping and supervision by location. Setting a device's address by physical means shall not be necessary.

### 2. Intelligent Detectors -- General

- a) The System Intelligent Detectors shall be capable of full digital communications using both broadcast and polling protocol. Each detector shall be capable of performing independent fire detection algorithms. The fire detection algorithm shall measure sensor signal dimensions, time patterns and combine different fire parameters to increase reliability and distinguish real fire conditions from unwanted deceptive nuisance alarms. Signal patterns that are not typical of fires shall be eliminated by digital filters. Devices not capable of combining different fire parameters or employing digital filters shall not be acceptable.
- b) Each detector shall have an integral microprocessor capable of making alarm decisions based on fire parameter information stored in the detector head. Distributed intelligence shall improve response time by decreasing the data flow between detector and loop controller. Detectors not capable of making independent alarm decisions shall not be acceptable. Maximum total loop response time for detectors changing state shall be 0.5 seconds.
- c) Each detector shall have a separate means of displaying communication and alarm status. A green LED shall flash to confirm communication with the loop controller. A red LED shall flash to display alarm status.
- d) The detector shall be capable of identifying up to 32 diagnostic codes. This information shall be available for system maintenance. The diagnostic code shall be stored at the detector.
- e) Each smoke detector shall be capable of transmitting pre-alarm and alarm signals in addition to the normal, trouble and need cleaning information. It shall be possible to program control panel activity to each level. Each smoke

detector may be individually programmed to operate at any one of five (5) sensitivity settings.

- f) Each detector microprocessor shall contain an environmental compensation algorithm which identifies and sets ambient "Environmental Thresholds" approximately six times an hour. The microprocessor shall continually monitor the environmental impact of temperature, humidity, other contaminants as well as detector aging. The process shall employ digital compensation to adapt the detector to both 24 hour long term and 4 hour short term environmental changes. The microprocessor shall monitor the environmental compensation value and alert the system operator when the detector approaches 80% and 100% of the allowable environmental compensation value. Differential sensing algorithms shall maintain a constant differential between selected detector sensitivity and the "learned" base line sensitivity. The base line sensitivity information shall be updated and permanently stored at the detector approximately once every hour.
- g) The intelligent detectors shall be suitable for mounting on any Signature Series detector mounting base.

### 3. Ionization Smoke Detector, SIGA-IS

- a) Provide intelligent ionization smoke detectors <SIGA-IS>. The ionization detector shall utilize a unipolar ionization smoke sensor to sense changes in air samples from its surroundings. The integral microprocessor shall dynamically examine values from the sensor and initiate an alarm based on the analysis of data. Systems using central intelligence for alarm decisions shall not be acceptable. The detector shall continually monitor any changes in sensitivity due to the environmental affects of dirt, smoke, temperature, aging and humidity. The information shall be stored in the integral processor and transferred to the loop controller for retrieval using a laptop PC or the SIGA-PRO Signature Program/Service Tool. The ion detector shall be rated for ceiling installation at a minimum of 30 ft (9.1m) centers and be suitable for wall mount applications. The ion smoke detector shall be rated for operation in constant air velocities from 0 to 75 ft/min. (0-0.38 m/sec) and with intermittent air gusts up to 300 ft/min. (1.52m/sec) for up to 1 hour.
- b) The percent smoke obscuration per foot alarm set point shall be field selectable to any of five sensitivity settings ranging from 0.7% to 1.6%. The ion detector shall be suitable for operation in the following environment:
  - 1) Temperature: 32°F to 120°F (0°C to 49°C)
  - 2) Humidity: 0-93% RH, non-condensing
  - 3) Elevation: Up to 6,000 ft. (1828 m)

### 4. Photoelectric Smoke Detector, SIGA-PS

- a) Provide intelligent photoelectric smoke detectors <SIGA-PS>. The photoelectric detector shall utilize a light scattering type photoelectric smoke sensor to sense changes in air samples from its surroundings. The integral microprocessor shall dynamically examine values from the sensor and initiate an alarm based on the analysis of data. Systems using central intelligence for alarm decisions shall not be acceptable. The detector shall continually monitor any changes in sensitivity due to the environmental affects of dirt, smoke, temperature, aging and humidity. The information shall be stored in the integral processor and transferred to the loop controller

for retrieval using a laptop PC <or the SIGA-PRO Signature Program/Service Tool>. The photo detector shall be rated for ceiling installation at a minimum of 30 ft (9.1m) centers and be suitable for wall mount applications. The photoelectric smoke detector shall be suitable for direct insertion into air ducts up to 3 ft (0.91m) high and 3 ft (0.91m) wide with air velocities up to 5,000 ft/min. (0-25.39 m/sec) without requiring specific duct detector housings or supply tubes.

- b) The percent smoke obscuration per foot alarm set point shall be field selectable to any of five sensitivity settings ranging from 1.0% to 3.5%. The photo detector shall be suitable for operation in the following environment:

- 1) Temperature: 32°F to 120°F (0°C to 49°C)
- 2) Humidity: 0-93% RH, non-condensing
- 3) Elevation: no limit

#### 5. Standard Detector Mounting Bases, SIGA-SB / SIGA-SB4

- a) Provide standard detector mounting bases SIGA-SB/SIGA-SB4 suitable for mounting on 1-gang, 3½" or 4" octagon box and 4" square box. The base shall, contain no electronics, support all Signature Series detector types and have the following minimum requirements:

- 1) Removal of the respective detector shall not affect communications with other detectors.
- 2) Terminal connections shall be made on the room side of the base. Bases which must be removed to gain access to the terminals shall not be acceptable.
- 3) The base shall be capable of supporting one (1) Signature Series SIGA-LED Remote Alarm LED Indicator.

#### 6. Duct Detector Housing, SIGA-DH

- a) Provide smoke detector duct housing assemblies SIGA-DH to facilitate mounting an intelligent photoelectric Detector SIGA-PS along with a standard detector mounting base. Provide for variations in duct air velocity between 300 and 4000 feet per minute (300 to 1000 feet per minute for ion-photo-heat detector). Protect the measuring chamber from damage and insects. Provide an air exhaust tube and an air sampling inlet tube which extends into the duct air stream up to ten feet. Provide drilling templates and gaskets to facilitate locating and mounting the housing. Provide five one gang knockouts for mounting optional Signature Series modules. Finish the housing in baked red enamel. Provide Remote Alarm LED Indicators SIGA-LED and Remote Test Stations SIGA-DTS.

#### 7. Intelligent Modules -- General

- a. It shall be possible to address each Intelligent Signature Series module without the use of DIP or rotary switches. Devices using DIP switches for addressing shall not be acceptable. The personality of multifunction modules shall be programmable at site to suit conditions and may be changed at any time using a personality code downloaded from the Loop Controller. Modules requiring EPROM, PROM, ROM changes or DIP switch and/or jumper changes shall not be acceptable. The modules shall have a minimum



of 2 diagnostic LEDs mounted behind a finished cover plate. A green LED shall flash to confirm communication with the loop controller. A red LED shall flash to display alarm status. The module shall be capable of storing up to 24 diagnostic codes which can be retrieved for troubleshooting assistance. Input and output circuit wiring shall be supervised for open and ground faults. The module shall be suitable for operation in the following environment:

- 1) Temperature: 32°F to 120°F (0°C to 49°C)
- 2) Humidity: 0-93% RH, non-condensing

8. Single Input Module, SIGA-CT1

- a) Provide intelligent single input modules SIGA-CT1. The Single Input Module shall provide one (1) supervised Class B input circuit capable of a minimum of 4 personalities, each with a distinct operation. The module shall be suitable for mounting on 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square boxes with 1-gang covers. The single input module shall support the following circuit types:

- 1) Normally-Open Alarm Latching (Manual Stations, Heat Detectors, etc.)
- 2) Normally-Open Alarm Delayed Latching (Waterflow Switches)
- 3) Normally-Open Active Non-Latching (Monitor, Fans, Dampers, Doors, etc.)
- 4) Normally-Open Active Latching (Supervisory, Tamper Switches)

9. Dual Input Module, SIGA-CT2

- a) Provide intelligent dual input modules SIGA-CT2. The Dual Input Module shall provide two (2) supervised Class B input circuits each capable of a minimum of 4 personalities, each with a distinct operation. The module shall be suitable for mounting on 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square boxes with 1-gang covers. The dual input module shall support the following circuit types:

- 1) Normally-Open Alarm Latching (Manual Stations, Heat Detectors, etc.)
- 2) Normally-Open Alarm Delayed Latching (Waterflow Switches)
- 3) Normally-Open Active Non-Latching (Monitor, Fans, Dampers, Doors, etc.)
- 4) Normally-Open Active Latching (Supervisory, Tamper Switches)

10. Single Input Signal Module, SIGA-CC1

- a) Provide intelligent single input signal modules SIGA-CC1. The Single Input (Single Riser Select) Signal Module shall provide one (1) supervised Class B output circuit capable of a minimum of 2 personalities, each with a distinct operation. When selected as a telephone power selector, the module shall be capable of generating its own "ring tone". The module shall be suitable for mounting on 2 ½" (64mm) deep 2-gang boxes and 1 ½" (38mm) deep 4" square boxes with 2-gang covers, or European 100mm square boxes. The single input signal module shall support the following operations:

- 1) Audible/Visible Signal Power Selector (Polarized 24 Vdc @ 2A, 25Vrms @50w or 70 Vrms @ 35 Watts of Audio)
- 2) Telephone Power Selector with Ring Tone (Fire Fighter's Telephone)

#### 11. Dual Input Signal Module, SIGA-CC2

- a) Provide intelligent dual input signal modules SIGA-CC2. The Dual Input (Dual Riser Select) Signal Module shall provide a means to selectively connect one of two (2) signaling circuit power risers to one (1) supervised output circuit. The module shall be suitable for mounting on 2 ½" (64mm) deep 2-gang boxes and 1 ½" (38mm) deep 4" square boxes with 2-gang covers, or European 100mm square boxes. The dual input signal module shall support the following operation:

- 1) Audible/Visible Signal Power Selector (Polarized 24 Vdc @ 2A, 25 Vrms @ 50w or 70 Vrms @ 35w of Audio)

#### 12. Control Relay Module, SIGA-CR

- a) Provide intelligent control relay modules SIGA-CR. The Control Relay Module shall provide one form "C" dry relay contact rated at 2 amps @ 24 Vdc to control external appliances or equipment shutdown. The control relay shall be rated for pilot duty and releasing systems. The position of the relay contact shall be confirmed by the system firmware. The control relay module shall be suitable for mounting on 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square boxes with 1-gang covers.

#### 13. Intelligent Manual Pull Stations

- a) Manual pull stations shall be metal double action type with CT1 module to monitor each pull station. Devices using DIP switches for addressing shall not be acceptable. It shall be model #RAM-1t-LD-NY manufactured by Ames. Provide 5" X 8" code card holder.

#### 14. Remote Relays (as required)

- a. Multi-Voltage Control Relays, MR-100 Series:
  - 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings shall be SPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 24 Vdc, 24 Vac, 115 Vac, or 230 Vac. A red LED shall indicate the relay is energized. A metal enclosure shall be provided.
- b) Multi-Voltage Control Relays, MR-200 Series:
  - 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings shall be DPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 24 Vdc, 24 Vac, 115 Vac, or 230 Vac. A red LED shall indicate the relay is energized. A metal enclosure shall be provided.
- c) Multi-Voltage Control Relays, MR-700 Series:
  - 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay

contact ratings shall be SPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 12 Vdc, 12 Vac, 24 Vdc, or 24 Vac. A red LED shall indicate the relay is energized.

- d) Multi-Voltage Control Relays, MR-800 Series:
  - 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings shall be SPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 24 Vdc, or 24 Vac, or 115 Vac. A red LED shall indicate the relay is energized.
- e) Manual Override Control Relays, MR-600 Series:
  - 1) Provide remote control relays each with manual override feature connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings shall be SPDT and rated for 10 amperes at 115 Vac or 24 Vdc. A single relay may be energized from a voltage source of 24 Vdc or 24 Vac. A red LED shall indicate the relay is energized.

#### 15. Floor-mounted Raceway Column for Pull Boxes

- a) Vista Point5 Architectural Column by Legrand Wiremold, or approved equal; small profile 36" high column. Anodized aluminum frame with round end channels. Adapters and finish plates as required to fit pull boxes.

### PART 3 – EXECUTION

#### 3.1 GENERAL

##### A. INSTALLATION

1. The entire system shall be installed in a workmanlike manner, in accordance with approved manufacturer's wiring diagram. The contractor shall furnish all conduit, wiring, outlet boxes, junction boxes, cabinets and similar devices necessary for the complete installation. All wiring shall be of the type recommended by the manufacturer, approved by the local Fire Department, and shall be installed in rigid, threaded conduit throughout.
2. All penetration of floor slabs and fire walls shall be fire stopped in accordance with all local fire codes.
3. End of Line Resistors shall be furnished as required for mounting as directed by the manufacturer.
4. All wiring shall be color coded throughout, to NYC Electrical Code standards.
5. The system shall be arranged to receive power from one three wire 120 Vac, 15 A supply. All low voltage operation shall be provided from the fire alarm control panel.
6. Wiring
  - a) Rigid conduit – THHN as per NYC approved.

- b) EMTwith Teflon – 150 C – fire alarm wiring – NYC approved
- c) Horn circuits 3#12
- d) Strobes 2 #14
- e) All other addressable loop wires #16 AWG.

7. Fire Alarm Fused Disconnect Power Supply (Fuse Cut-Out)

- a) Must be installed within 10 foot distance from the service switch and connected on the line side.

B. FIELD QUALITY CONTROL

- 1. The system shall be installed and fully tested under the supervision of a trained manufacturer's representative. The system shall be demonstrated to perform all of the function as specified.

C. TESTS

- 1. Reports of any field testing during installation shall be forwarded to the Commissioner.
- 2. Each individual system operation on a circuit by circuit basis shall be tested for its complete operation. The procedure for testing the entire fire alarm system shall be set forth with the consent of the code enforcement official, the Commissioner and the manufacturer.

D. DOCUMENTATION AND INSTRUCTION

- 1. The contractor shall compile and provide to the City of New York three (3) complete manual on the completed system to include operating and maintenance instruction, catalog cuts of all equipment and components, as-built wiring diagrams and a manufacturer's suggested spare parts list.
- 2. In addition to the above manuals, the contractor shall provide the services of the manufacturer's representative for a period of four (4) hours to instruct the City of New York's designated personnel on the operation and maintenance of the entire system. An End-User Training Video shall be included as part of the system documentation.

END OF SECTION 28 31 00

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## SECTION 31 10 00

## SITE CLEARING

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the access doors as indicated on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Removing existing trees, shrubs, groundcovers, plants and grass.
  - 2. Clearing and grubbing.
  - 3. Stripping and stockpiling topsoil.
  - 4. Removing above- and below-grade site improvements.
  - 5. Temporary erosion and sedimentation control measures.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Temporary Facilities and Controls – Division 1 for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and temporary erosion and sedimentation control procedures.
- C. Selective Demolition – Section 02 40 00.
- D. Earthwork – Section 31 20 00.
- E. Planting – Section 32 90 00.

#### 1.4 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

#### 1.5 MATERIAL OWNERSHIP

- A. Except for stripped topsoil or other materials indicated to remain on City of New York property, cleared materials shall become property of the City of New York and shall be removed from Project site.

#### 1.6 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS

does not include a product's VOC content, 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 content).

- B. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- C. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.
- D. Record drawings, according to DDC General Conditions, identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

## 1.7 QUALITY ASSURANCE

- A. Pre-installation Conference: Conduct conference at Project site to comply with requirements in DDC General Conditions.

## 1.8 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Commissioner and the City of New York..
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by the Commissioner.
- B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Commissioner's property will be obtained by Commissioner.
  - 1. Do not proceed with work on adjoining property until directed by Commissioner.
- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Commissioner's premises where indicated.
- D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- E. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS



- A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 31 Section "Earthwork."
  - 1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly flag trees and vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.
  - 1. Restore damaged improvements to their original condition, as acceptable to Commissioner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of the City of New York.
- B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction.
  - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
  - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
  - 3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
  - 4. Use only hand methods for grubbing within tree protection zone.
  - 5. Chip removed tree branches and stockpile in areas approved by Commissioner.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

### 3.4 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
  1. Remove subsoil and non-soil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  1. Limit height of topsoil stockpiles to 72 inches.
  2. Do not stockpile topsoil within tree protection zones.
  3. Dispose of excess topsoil as specified for waste material disposal.
  4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

### 3.5 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
  1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
  2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

### 3.6 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Commissioner's property.
  1. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION

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## SECTION 31 20 00

## EARTHWORK

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the earthwork as shown on the drawings and/or specified herein, including but not necessarily limited to the following:
  - 1. All engineering, surveying and lay out all lines and levels.
  - 2. Protection and safeguards.
  - 3. Excavating for footings, foundations and below grade construction.
  - 4. Excavating for all underground mechanical and electrical utilities.
  - 5. Filling and backfilling to attain indicated grades.
  - 6. Preparation of sub-grade for building slab, walks, pavements, behind foundation walls and grass areas including grading.
  - 7. Aggregate sub-base below concrete slabs.
  - 8. Dewatering.
  - 9. Shoring and bracing.
  - 10. Underpinning (if required).
  - 11. Disposal of all excavated materials not used as backfill on the site.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Cast-in-Place Concrete – Section 03 30 00.
- C. Site Clearing - Section 31 10 00.
- D. Precast Concrete Pavers - Section 32 14 13.
- E. Planting - Section 32 90 00.

## F. Storm Drainage Utilities – Section 33 40 00.

## 1.4 SUMMITALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
  5. Erosion and Sedimentation Control Plan: as indicated on the drawings and in compliance with the appropriate LEED requirements and authorities having jurisdiction.
- B. Submit the following at least 14 days before commencement of the work under this Section for approval by the Commissioner.

1. General proposed excavation procedures including compaction equipments appropriate for the site condition and compaction requirements.
2. Results of grain size analyses (ASTM D422) and Modified Proctor Compaction Tests (ASTM D1557) of the soils proposed for use by the Contractor as backfill.
3. General procedures for preparation of the subgrade.
4. The Contractor shall submit his proposed dewatering plan for review by the Commissioner.

## 1.5 JOB CONDITIONS

### A. Dust Control

1. Use all means necessary to control dust on or near the work.
2. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and performance of other work on the site.
3. Provide vehicle wheel cleaning to prevent tracking of soil, dirt, etc., onto public streets.

### B. Protection

1. Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.
2. Provide the necessary safeguards to prevent accidents, to avoid all unnecessary hazards and protect the public, the work and the property at all times, including Saturdays, Sundays and holidays.
3. Be responsible for any and all damages which may arise or occur to any party whatsoever by reason of the neglect in providing proper lights, guards, barriers, or any other safeguards to prevent damage to property, life and limb.
4. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

### C. Existing Underground Utilities

1. Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
2. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the utility provider immediately for directions. Cooperate with Commissioner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility provider.
3. Do not interrupt existing utilities serving facilities occupied and used by Queens Library or others, except when permitted in writing by the Commissioner and then only after acceptable temporary utility services have been provided.
4. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.

- D. Explosives: Do not bring explosives onto site or use in work without prior written permission from Commissioner. Contractor is solely responsible for handling, storage, and use of explosive materials when their use is permitted.

## 1.6 EROSION AND SEDIMENTATION CONTROL

- A. The Contractor is responsible for the performance of all work, furnishing all materials and installing all measures required to control soil erosion resulting from construction operations and preventing excessive flow of sediment from the construction site per the Erosion and Sedimentation Control Plan, documented on the drawings. This work must be accomplished in accordance with the requirements of local and state regulatory agencies.

## PART 2 PRODUCTS

### 2.1 ON SITE MATERIAL

- A. No on-site excavated material may be used for filling or backfilling unless approved by the Commissioner; all non-approved material shall be promptly removed off site by the Contractor.

### 2.2 IMPORTED FILL MATERIAL

- A. Imported fill material shall consist of clean, well graded sand and/or gravel containing less than fifteen (15) percent by weight of materials passing a No. 200 sieve and a maximum particle size of four (4) inches.

### 2.3 AGGREGATE SUB-BASE BELOW SLAB ON GRADE

- A. Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with one-hundred (100) percent passing a 1-1/2" sieve and not more than five (5) percent passing a No. 4 sieve.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where earthwork is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

### 3.2 GENERAL

#### A. Familiarization

- 1. Prior to all work of this Section, become thoroughly familiar with the site, site conditions, and all portions of the work falling within this Section. Correct any unsatisfactory conditions encountered.

#### B. Backfilling Prior to Approvals

- 1. Do not allow or cause any of the work performed or installed to be covered up or enclosed by work of this Section prior to all required inspections and approvals.

2. Should any of the work be so enclosed or covered up before it has been approved, uncover all such work at no additional cost to the City of New York.
3. After the work has been completely inspected and approved, make all repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, all at no additional cost to the City of New York.

### 3.3 CONTACTOR'S RESPONSIBILITY

- A. Prior to the commencement of work, the Contractor shall have examined all drawings and Specifications, shall have visited the site, consulted the records of adjacent construction and of existing utilities and their connections, and noted conditions and limitations which may influence the work of this Section.
- B. The Contractor shall take all necessary precautions to guard against settlement or collapse of structures adjoining the new work. He shall protect public and private property adjacent to the job site, including existing building foundations, existing utilities, light standards, hydrants, and signs. The Contractor shall at his own expense, make repairs to damaged property necessitated by reason of, or occurring in the course of operations under this Contract, to the complete satisfaction of the Commissioner of the damaged property.
- C. The Contractor shall be totally responsible for safety measures taken by him during the progress of the work.
- D. The Contractor shall retain, at his own expense, the services of a Professional Engineer to advise on all construction techniques involved in the work, including the design, checking and approval of temporary bracing, shoring, underpinning and other items pertinent to the work, and on construction methods for solution of problems which may be encountered during the course of the work. This is critical for the deeper excavation required. The Contractor's Engineer shall consult him on construction methods which will eliminate the risk of settlement and/or damage to the existing structure adjacent structures, utilities and facilities on City of New York property and on property adjoining the site of the work. The contractor shall provide shop drawings of the support of excavation, underpinning and temporary wall bracing, signed and sealed by the P.E. retained, to the Commissioner for review. The temporary shoring and bracing methods will be subject to review by the Commissioner.
- E. The Contractor shall maintain general natural drainage of the property during earthwork operations. Should flooding of work areas occur, remove all water by pumping or other means as described under Section 3.5 of this Specification.
- F. The Contractor shall lay out the work completely and in accordance with the drawings and the reference points. Safeguard all reference stakes, points and bench marks and replace same if disturbed or removed by negligence or without prior approval. Cooperate in protecting temporary stakes during the progress of the Work.
- G. The Contractor shall maintain and protect newly graded areas from the actions of the elements. Any settlement or washing that occurs prior to acceptance of the work, shall be repaired and grades re-established to the required elevations and slopes.
- H. The Contractor shall execute the work with promptness and diligence, but excavation or filling shall not be done when the ground is frozen or too wet for proper compaction as determined by the Commissioner. Claims for extra payment resulting from weather conditions will not be considered.



- I. The Contractor shall remove and properly and legally dispose of all excavated material.
- J. The Contractor shall keep all roads, public and private, free of dirt, mud, snow, ice and debris resulting from this work.
- K. Where backfill, or subbase materials must be moisture conditioned to reach optimum moisture content, apply water uniformly to prevent free water from appearing on surface during or subsequent to compaction operations.

### 3.4 FINISH ELEVATIONS AND LINES

- A. For setting and establishing layout of building and finish elevations and lines, secure the services of a registered civil engineer or a licensed land surveyor acceptable to the Commissioner. Carefully preserve all data and all monuments set by the civil engineer or surveyor and, if displaced or lost, immediately replace at no additional cost to the City of New York.

### 3.5 EXCAVATION

- A. Based on the subsurface information obtained from the test borings drilled, the excavation will be made in soil. The design of cut slopes and temporary support shall be the responsibility of the licensed NY Professional Engineer retained by the foundation contractor, and should conform to the pertinent OSHA and local safety regulations. The design soil loads and excavation support scheme should be reviewed by the Commissioner's Engineer prior to excavation and installation of the support system.
- B. Soil Excavation
  - 1. If space allows, the side of the excavation in soil shall be at a slope no greater than 1H:1V above the ground water level and no greater than 2H:1V below the ground water level.
  - 2. In areas of the building excavation where space constraints require steeper side slopes than those previously discussed, the Contractor shall provide a suitable method for the temporary bracing of the excavation.
- C. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimension without specific direction of Commissioner. Unauthorized excavation, as well as remedial work directed by Commissioner, shall be at Contractor's expense.
  - 1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Commissioner.
  - 2. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classifications, unless otherwise directed by Commissioner.
- D. Additional Excavation: When excavation has reached required subgrade elevations, notify Commissioner who will make an inspection of conditions.
  - 1. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by the Commissioner. Excavation of unsuitable material must extend laterally beyond the

edge of the footing or slab for a distance equal to or greater than the required depth of the excavation.

- E. Perform excavation with drip line of large trees to remain by hand, and protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of one (1) diameter and larger with emulsified asphalt tree paint.
- F. Stability of Excavations: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- G. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition.
  - 1. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction.
  - 2. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
- H. Dewatering: Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.
  - 1. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations. Maintain water levels below base of excavation to control hydrostatic pressure on subgrade soils.
  - 2. Establish and maintain temporary drainage ditches and other diversion outside excavation limits to convey rain water and water removed from excavations to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.
- I. Material Storage: Stockpile satisfactory excavated materials where directed until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
  - 1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
  - 2. Dispose of excess soil material and waste materials not re-used.
- J. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
  - 1. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.
- K. Excavation for Pavements: Cut surface under pavements to comply with cross sections, elevations and grades.

- L. Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide six (6) inches to nine (9) inches clearance on both sides of pipe or conduit.
1. Excavate trenches to depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations. Beyond building perimeter, keep bottoms of trenches sufficiently below finish grade to avoid freeze ups.
  2. Where rock is encountered, carry excavation six (6) inches below required elevation and backfill with a six (6) inch layer of crushed stone or gravel prior to installation of pipe.
  3. For pipes or conduit five (5) inches or less in nominal size and for flat bottomed multiple duct conduit units, do not excavate beyond indicated depths. Hand excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
  4. For pipes or conduit six (6) inches or larger in nominal size, tanks and other mechanical/electrical work indicated to receive subbase, excavate to subbase depth indicated, or if not otherwise indicated, to six (6) inches below bottom of work to be supported.
  5. Except as otherwise indicated, excavate for exterior water-bearing piping (water, steam, condensation, drainage) so top of piping is not less than three (3) feet to six (6) feet below finished grade.
  6. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.
  7. Backfill trenches with concrete where trench excavations pass within eighteen (18) inches of column or wall footings and which are carried below bottom of such footings, or which pass under wall footing. Concrete shall conform to the requirements of Section 033000.
  8. Do not backfill trenches until tests and inspections have been made and backfilling authorized by Commissioner. Use care in backfilling to avoid damage or displacement of pipe systems.
  9. For piping or conduit less than two (2) feet to six (6) inches below surface of roadways, provide four (4) inch thick concrete base slab support. After installation and testing of piping or conduit, provide minimum four (4) inch thick encasements (sides and top) of concrete prior to backfilling or placement of roadway subbase.
- M. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than thirty-five (35) degrees F.
- N. Wet Weather Protection: Protect excavation bottoms against wet weather or remove the disturbed material as mentioned elsewhere or as directed by the Engineer.

### 3.6 COMPACTION

- A. Once the design subgrades are established, the filled and the indigenous soils shall be proof-compacted using a smooth drum self propelled vibratory compactor which develops a centrifugal force of at least 40,000 pounds and a frequency of at least 1,200 vpm. The compactor shall complete eight (8) passes across the exposed soil grades to improve their density and uniformity. Depending on the access conditions for a self propelled vibratory compactor, the Contractor shall use a compactor (and corresponding number of passes) approved by the Commissioner.

- B. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.
- C. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum dry density as determined in accordance with ASTM D1557.
1. Structures, Building Slabs and Steps, Pavements: Compact each layer of backfill or fill material to ninety-five (95) percent maximum dry density, at + 2% of its optimum moisture content.
  2. Lawn or Unpaved Areas: Compact top six (6) inches of subgrade and each layer of backfill or fill material to eighty-five (85) percent maximum dry density.
  3. Walkways: Compact each layer of backfill or fill material to ninety (90) percent maximum dry density.
- D. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
    - a. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to within + 2% of its optimum moisture content.

### 3.7 BACKFILL AND FILL

- A. General: Place acceptable soil material in layers to required elevations for each area classification listed below and as shown on the Contract Drawings.
1. In excavations, use satisfactory excavated or borrow material.
  2. Under grassed areas, use satisfactory excavated or borrow material.
  3. Under walks and pavements, use aggregate subbase material.
  4. Under steps, use aggregate subbase material.
  5. Under building slabs, use aggregate subbase material.
  6. Under piping and conduit, use existing subbase material where subbase is indicated under piping or conduit; shape to fit bottom ninety (90) degrees of cylinder.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
  2. Inspection, testing, approval, and recording locations of underground utilities.
  3. Removal of concrete formwork after concrete has attained twenty-eight (28) day design strength.
  4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structure or utilities, or leave in place if required.

5. Removal of trash and debris.
  6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
  7. Acceptance of prepared subgrades as required by the Contract specifications, Contract drawings and New York City Building Code.
- C. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than one (1) vertical to four (4) horizontal so that fill material will bond with existing surface.
1. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture condition to optimum moisture content, and compact to required depth and percentage of maximum density.
- D. Placement and Compaction: Place backfill and fill materials in layers not more than eight (8) inches in loose depth for material compacted by heavy compaction equipment, and not more than four (4) inches in loose depth for material compacted by hand operated tampers.
1. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
  2. Place backfill and fill materials evenly adjacent to structures, piping or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.

### 3.8 GRADING

- A. General: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
- B. Grading Outside Building Lines: Grade Areas adjacent to building lines to drain away from structures and to prevent ponding.
1. Finish surfaces free from irregular surface changes.
  2. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 feet above or below required subgrade elevations.
  3. Walks: Shape surface of areas under walks to line, grade and cross section, with finish surface not more than 0.10 feet above or below required subgrade elevation.
  4. Pavements: Shape surface of areas under pavement to line, grade and cross section, with finish surface not more than 1/2" above or below required subgrade elevation.

- C. Grading Surface of Fill under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2" when tested with a ten (10) foot straightedge.
- D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum density for each area classification.

### 3.9 BUILDING SLAB AGGREGATE SUB-BASE COURSE

- A. Placing: Place material on prepared subgrade in layers of uniform thickness, conforming to indicated cross section and thickness. Maintain optimum moisture content for compacting material during placement operations.
- B. When aggregate sub base is shown to be six (6) inches thick or less, place material in a single layer. When shown to be more than six (6) inches thick, place material in equal layers, except no single layer more than six (6) inches or less than three (3) inches in thickness when compacted.

### 3.10 GUARANTEE SERVICE

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
  - 1. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.
- C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### 3.11 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Removal from City of new York Property: Remove waste materials, including unacceptable excavated material, trash and debris, and dispose of it off Commissioner's property and in accordance with local regulations, all at the Contractor's expense.

END OF SECTION

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## SECTION 31 63 33

## DRILLED MINIPILES

## PART 1 - GENERAL

## 1.1 SCOPE

- A. The work under this Section shall consist of constructing minipiles with a design capacity of 70 kips as shown on the contract drawings. The minipiles specialty Contractor is responsible for furnishing of all materials, products, accessories, tools, equipment, services, transportation, labor and supervision, and manufacturing techniques required for installation of minipiles and pile top attachments for this project.
- B. Work include, but not limited to:
  - 1. Drilling minipile holes
  - 2. Casing and reinforcement installation
  - 3. Tremie grouting and pressure grouting
  - 4. Surveying measurements to determine locations, alignment, deviations, etc., of minipiles
  - 5. Load test
  - 6. All other items as mentioned elsewhere in this section, any related section of the Contract specifications and related Contract drawings

## 1.2 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Earthwork – Section 31 20 00.

## 1.4 REFERENCES

- A. American Society of Testing and Materials (ASTM) standards, latest editions.  
A252 Welded and Seamless Steel Pile Piles



A775 Epoxy-coated Reinforcing Steel Bars  
C31 Standard Methods of Making and Curing Concrete Test Specimens in the Field.  
C33 Standard Specifications for Concrete Aggregates.  
C109 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars  
(Using 2-inch or 50 MM Cube Specimens).  
C150 Standard Specification for Portland Cement.

- B. "Standard Welding Symbols - A2.0" - American Welding Society (AWS).
- C. Specification for Mild Steel Covered Arc - Welding Electrodes - A5.5 - AWS.
- D. "Specification for low alloy steel covered arc - welding electrodes - A5.5 - AWS.
- E. "Structural Welding Code - D1.1" - AWS.
- F. "Code of Standard Practice for Steel Buildings and bridges" - AISC.

## 1.5 QUALITY ASSURANCE

### A. Minipile Contractor's Requirements and Submittals

1. The piling contractor shall have at least three years experience in the kind of work specified herein and will be required to submit a list of projects successfully completed where he has installed this type of pile in similar ground conditions.
2. At least 45 calendar days before the planned start of minipile construction, the Contractor shall submit 5 copies of the completed project reference list and a personnel list. The project reference list shall include a brief project description with the owner's name and current phone number. The personnel list shall identify the minipile system designer (if applicable), supervising project engineer, drill rig operators, and on-site foreman to be assigned to the project. The personnel list shall contain a summary of each individual's experience and be complete enough for the Commissioner to determine whether each individual satisfies the required qualification.
3. Work shall not be started, nor materials ordered, until the Commissioner's written approval of the Contractor's experience qualifications is given. The Commissioner may suspend the Work if the Contractor uses non-approval personnel.

### B. Regulatory Requirements

1. Building Code: Work of this section shall conform to all requirements of the NYC Building Code 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 section, the requirements of this section shall govern.
2. New York City Board of Standards and appeals (BSA) approvals, or
3. NYC materials and equipment acceptance (MEA) approvals.

### C. Certifications

1. Structural steel shall conform to the material acceptance, certification and inspection requirements of article 7, Chapter 1 - Subchapter 1 and tables 10-1 and 10-2 of the Building Code (title 27).
2. Quality welding processes and welding operators in accordance with AWS "Standard Qualification Procedure".

D. Furnish all tests, reports, and affidavits required by the Department of Buildings

E. Lines Grades

1. Base lines and bench marks shall be established by the Contractor, from property lines, building lines, and benchmarks established by the Owner.
2. The Contractor shall be responsible for establishing the correct plan location and cutoff elevation of each drilled minipile in the field utilizing the established base lines and benchmarks.
3. The Contractor shall employ a New York State Registered Land Surveyor who shall determine and certify the actual location of each minipile as installed upon completion. Contractor shall submit to the Geotechnical Commissioner five prints of as-built drawings having the same size as the Contract Drawings. These drawings shall show minipile designation number, cutoff elevation as installed, and deviation(s) from plan location in the north-south and/or east-west direction, diameter of shaft, top elevation, length of casing, depth drilled through overburden, depth drilled into bearing stratum and size of steel core.

F. Subsurface Conditions

1. The Contractor is advised to study the geotechnical boring logs, and other information available at the office of the Commissioner.
2. The Contractor may carry out any additional investigations he deems necessary or desirable, provided this work is done at no additional cost to the Owner, and without delay of performance and completion. All information so obtained shall be made available to the Commissioner.

## 1.6 UTILITY LINES

- A. Before minipile installation begins, the Contractor shall contact all public agencies and private utility corporations for precise locations of existing utilities in order to protect functioning utility lines. The Commissioner shall advise the Contractor which utility lines are to remain and which are to be demolished or relocated by others. Should excavation by this Contractor over or near utilities be required, ensure that protective work will be coordinated and performed in accordance with the requirements of the Commissioner and authorities having jurisdiction.

## 1.7 SUBGRADE, OBSTRUCTION

- A. The Contractor is advised that particular care shall be taken not to disturb existing tunnels, floor slabs, walls and footings which may support adjacent structures. Notify the Commissioner immediately if any questionable obstructions are encountered and do not proceed with work until the Commissioner gives his approval.
- B. It shall be the responsibility of the Contractor, when boulders or any other obstructions are encountered, to carry the drilling through or past such obstruction to the diameter specified and to the required depth specified in the Contract Documents.
- C. Notify Commissioner in writing immediately for directions as to procedure should any uncharted or incorrectly charted piping or utilities be encountered during excavation. Cooperate with the Owner and utility cooperations in keeping their respective utilities in operation.

## 1.8 PERMITS

- A. The Contractor shall be responsible for obtaining any and all permits required to execute the performance of the work.

#### 1.9 PROTECTION

- A. The Contractor shall take every precaution to guard against any movement or settlement of the existing structures.
- B. The Contractor shall perform a preconstruction condition survey of all structure/utilities with 50 ft of the proposed construction prior to start of construction.
- C. The Contractor shall monitor the movement of any existing structures located adjacent to the project site. The Contractor shall submit a monitoring plan for approval, prior to starting work. The monitoring plan shall include continuous measurements of vibrations during drilling operations, and monitoring adjacent buildings with survey points.

#### 1.10 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.  
The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:
  - 1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  - 2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  - 3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  - 4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.

- B. The Contractor shall prepare and submit to the Commissioner, for review of completeness, 5 copies of the following for the minipile system or systems to be constructed;
1. Detailed step-by-step description of the proposed minipile construction procedure, including personnel, testing and equipment to assure quality control. This step-by-step procedure shall be shown on the working drawings in sufficient detail to allow the Commissioner to monitor the construction and quality of the minipiles.
  2. Proposed start date and time schedule and minipile installation schedule.
  3. Information on headroom and space requirements for installation equipment that verify the proposed equipment can perform at the site.
  4. Plan describing how surface water, drill flush, and excess waste grout will be controlled.
  5. Certified mill test reports for the reinforcing steel or coupon test results for permanent casing without mill certification. The ultimate strength, yield strength, elongation, and material properties composition shall be included.
  6. Proposed Grouting Plan. The grouting plan shall include complete descriptions, details, and supporting calculations for the following;
    - a. Grout density, mix design and type of materials to be used in the grout including certified test data and trial batch reports.
    - b. Methods and equipment for accurately monitoring and recording the grout depth, grout volume and grout pressure as the grout is being placed.
    - c. Grouting rate calculations, when required by the Commissioner. The calculations shall be based on the initial pump pressures or static head on the grot and losses throughout the placing system, including anticipated head of drilling fluid (if applicable) to be displaced.
    - d. Estimate curing time for grout to achieve specified strength. Previous test results for the proposed grout mix completed within one year of the start of grouting may be submitted for initial verification and acceptance and start of production work.
    - e. Procedure and equipment for Contractor monitoring of grout quality.
- C. Work shall not begin until the construction submittals have been received, reviewed, and accepted in writing by the Commissioner. Provide submittal items at least 21 calendar days prior to initiating minipile construction. The Contractor shall allow the Commissioner 7 calendar days to review the construction submittals after a complete set has been received. Additional time required due to incomplete or unacceptable submittals shall not be cause for delay or impact claims. All costs associated with incomplete or unacceptable Contractor submittals shall be the responsibility of the Contractor.

#### 1.11 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01 81 13, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 01 33 29.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## 1.12 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site at such intervals as to insure uninterrupted progress of work.
- B. Store materials to permit easy access for inspection and identification.
- C. Protect material from the elements and from other damage at the site. Replace and pay for material and work damaged and rejected by the Authority.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Steel Casing
  - 1. Permanent steel casing/pipe shall have the diameter and at least minimum wall thickness shown on the contract plans. The permanent steel casing/pipe:
    - a. Shall meet the Tensile Requirements of ASTM A252, Grade 2
    - b. Shall be free from defects (dents, cracks, tears) and with two coupon tests per truckload delivered to the source.
  - 2. Splices in the steel casing shall be of external sleeve type welded top and bottom; or the splice shall be a full butt weld.
  - 3. Any casing found to be crushed or broken by drilling, or by earth or water pressure, shall be removed and replaced by a suitable casing of heavier weight.
  - 4. The steel casing is to be permanently left in place.
- B. Reinforcing Steel
  - 1. Reinforcing steel shall be deformed bars in accordance with ASTM A615 or A722, as shown on the contract plans, and shall have threading that is continuous spiral deformed ribbing, as provided by Dywidag, SAS Stressteel, or approved equivalent. The size of the reinforcing steel shall be as shown on the contract plans.
  - 2. Bar tendon couplers shall develop the ultimate tensile strength of the bard without evidence of any failure.
- C. Grout
  - 1. Neat cement or sand/cement mixture with a minimum 7-day compressive strength as shown on the contract plans. The grout shall have a minimum 28-day cube strength of 4,000 psi. The compressive strength determination shall be as per ASTM C109.
- D. Admixtures for Grout
  - 1. Admixtures shall conform to the requirements of ASTM C494. Admixtures that control bleed, improve flowability, reduce water content, and retard set may be used in the grout, subject to the review and acceptance of the Commissioner. Admixtures shall be compatible with the grout and mixed in accordance with the manufacturer's recommendations. Accelerators are not permitted. Admixtures containing chlorides are not permitted.
- E. Centralizers and Spacers
  - 1. Centralizers and spacers shall be fabricated from schedule 40 PVC pipe or tube, steel, or material non-detrimental to the reinforcing steel.

### 2.2 SOURCE QUALITY CONTROL

## A. Testing

1. Structural steel casings are subject to all tests required by the Special Inspection requirements of the NYC Building Code.
2. Piles are subject to all tests and requirements of the NYC Building Code.
3. Tests of grout in accordance with requirements of paragraph 3.3.

## PART 3 - EXECUTION

## 3.1 DRILLING

- A. Contractor shall anticipate encountering boulders and/or concrete and brick pieces in fill material. The drilling equipment and methods shall be suitable for drilling through the conditions to be encountered, without causing damage to any underlying, overlying or adjacent structures or services; the weight of the drilling rig shall be less than 8,000 lb. The casing in soil shall be installed using rotary duplex drilling techniques. If duplex drilling is performed, the outside casing is to be advanced simultaneously with the inner drill rod to the designed depth. Diameter of the cutting shoe of the casing shall not exceed the outer diameter of the casing by more than 1/4 inch. Vibratory or impact pile driving hammers shall not be used to advance the casings. Air percussion drilling is not allowed.
- B. During construction, the Contractor shall observe the conditions in the vicinity of the minipile construction site on a daily basis for signs of ground heave or subsidence. Immediately notify the Commissioner if signs of movements are observed. Contractor shall immediately suspend or modify drilling or grouting operations if ground heave or subsidence is observed or if adjacent structures are damaged from the drilling or grouting. If the Commissioner determines that the movements require corrective action, the Contractor shall take corrective actions necessary to stop the movements or perform repairs.
- C. When due to the Contractor's methods or operations or failure to follow the specified/approved construction sequence, as determined by the Commissioner, the costs of providing corrective actions will be borne by the Contractor.

## 3.2 GROUTING

- A. The drillhole must be open along its full length to at least the minimum drillhole diameter shown on the contract plans prior to grouting. The grouting equipment used shall produce a grout free of lumps and undispersed cement. The Contractor shall have means and methods of measuring the grout quantity during the grouting operations. The grout shall be kept in agitation prior to mixing; the grout shall be placed by gravity flow within one hour of mixing; the grouting equipment shall be sized to enable each pile to be grouted in one continuous operation; the grout shall be injected from the lowest point of the drill hole through a tremie pipe and injection shall continue until uncontaminated grout flows from the top of the pile. The tremie pipe shall always extend below the level of the existing grout in the drillhole during grouting. The grout pressures and grout rates shall be controlled to prevent excessive heave or soil formations. Upon completion of grouting, the grout tube may remain in the hole, but must be filled with grout.

## 3.3 GROUT TESTING

- A. Grout within the minipile verification and proof test piles shall attain the minimum required strength shown on the contract plans prior to load testing. Previous test results for the

proposed grout mix completed within one year of the start of work may be submitted for initial verification of the required compressive strengths for installation of pre-production verification test piles and initial production piles. During production, minipile grout shall be tested by the Contractor for compressive strength in accordance with AASHOTO T106/ASTM 109 at a frequency of no less than one set of three, 3-inch by 2-inch grout cubes from each grout plant each day of operation. The compressive strength shall be the average of the 3 cubes tested.

- B. Grout consistency as measured by grout density shall be determined by the Contractor per ASTM C188 at a frequency of at least one test per pile, conducted just prior to the start of pile grouting. The Baroid Mud Balance used in accordance with API RP-13B-1 is an approved device for determining the grout density if neat cement grout. Grout samples shall be taken directly from the grout plant and prepared by Special Inspector. Testing will be performed by Testing Agency.

### 3.4 SPECIAL INSPECTIONS

- A. Special inspections as required by the N.Y. City Building Code will be performed by the Commissioner assisted by the Testing Agency retained by the City of New York.
- B. Piling contractor shall give the Commissioner at least 7 days notice prior to commencing work on the project. Once project is underway, piling contractor shall notify each party at least 24 hours in advance of all work subject to their inspection.
- C. Piling contractor shall furnish all access, labor and equipment as required by the Commissioner or Testing Agency to perform their duties.
- D. All drilling and grouting operations shall be performed under full time inspection of the Commissioner.

### 3.5 DETERMINATION OF PILE DIAMETER AND LENGTH

- A. The length and diameter of the piles shall be as given herein and/or in the Contract Drawings. These dimensions may be revised as a result of soil foundation bearing information obtained during pile installation and subject to the approval of the Commissioner.

### 3.6 LOCATION OF PILES

- A. Piles shall be located as shown on the contract drawings or as otherwise directed by the Commissioner. Pile centers shall be located to an accuracy of 3 inches at the top of minipile and shall be plumb within 2% of its embedded length. In the event that non-drivable material is encountered which prevents installing a pile to the depth required, the short pile shall be completed as described herein, and, if necessary an additional adjacent pile or piles shall be placed as directed by the Commissioner at no additional cost to the City of New York.

### 3.7 PILE CUT-OFF

- A. Pile cut-off shall be performed at elevation shown on the contract drawings.

### 3.8 PILE LOAD TESTS

- A. One load test shall be performed in accordance with ASTM D1143 standard procedure and the New York City Building Code requirements. The Contractor shall provide reaction system, calibrated jack, load cells, reference beams, dial gages, personnel to operate the jacking system and a NY State licensed Surveyor to obtain secondary settlement measurements. Grout shall have attained adequate strength for testing prior to performance of the load test. The load testing system shall be submitted to the Commissioner for approval.

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## SECTION 32 10 00

## PAVING

## PART 1. - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Furnish and install asphalt pavement, sidewalks, and curbing required during construction in accordance with approved Builder's Pavement Plan.
- B. Provide stone base material, asphaltic concrete binder and wearing course, concrete, steel-faced curbs, and wire mesh reinforcing as necessary to complete scope in 1.2.A.
- C. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 RELATED SECTIONS

- A. Division 01 – DDC General Conditions
- B. Earthwork - Section 312000.
- C. Precast Concrete Pavers – Section 321413
- D. Planting – Section 329300

## 1.3 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The Contractor and their Subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

- 1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the Contractor's or Subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).

- b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per Subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: For each product specified, include technical data and tested physical and performance properties.
  - C. Samples: Color samples for pavement and concrete.
  - D. Job Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
  - E. Qualification Data: For firms specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architects and Owners and other information specified.
  - F. Material Certificates: Certificates signed by manufacturers certifying that each material complies with specified requirements.
  - G. Installer Qualifications: Engage an experienced installer who has completed hot-mix asphalt paving similar in material, design and extent to that indicated for this Project and with a record of successful in-service performance.
  - H. Firm shall be a registered and approved paving mix manufacturer with the NYS or NYC DOT.
  - I. Asphalt-Paving Publication: Comply with AI's "The Asphalt Handbook," except where more stringent requirements are indicated.

J. Preinstallation Conference: Conduct conference at Project site to comply with requirements related to asphalt paving including, but not limited to, the following:

1. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
2. Review condition of substrate and preparatory work performed by other trades.
3. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
4. Review and finalize construction schedule for paving and related work. Verify availability of materials, paving Installer's personnel and equipment required to execute the Work without delays.
5. Review inspection and testing requirements, governing regulations and proposed installation procedures.
6. Review forecasted weather conditions and procedures for coping with unfavorable conditions.

#### 1.4 REFERENCES

- A. The City of New York, Department of Transportation, Bureau of Highways, Roadway Division, Standard Details of Construction manual.

#### 1.5 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 018419, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.6 SAFETY

- A. The Contractor shall post signs for safety. Local traffic is to be maintained at all times. A flag man should be used to direct traffic when necessary.
- B. During performance of the Work, the Contractor must take all reasonable precautions to protect the site. The Contractor shall provide, place and adequately maintain sufficient guards, lights, barricades and enclosures. The Contractor shall retain steel roadway plates on-site for trench protection during construction.
- C. All materials are to be stored within the property. No stock piling material or equipment in the street.
- D. The Contractor is responsible for utility company notification – Code 53.

- E. It is recommended that the Contractor take some photographs of the area before the commencement of the work.

#### 1.7 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary. The contractor shall not accept delivery of any damaged materials to the site. Damaged materials shall not be used. The inspector shall have final say over any materials in question.

#### 1.8 QUALITY ASSURANCE

- A. Materials and Methods of Construction Shall Comply with the Following Standards:
  - 1. American Society for Testing and Materials (ASTM).
  - 2. American Association of State Highway and Transportation Officials (AASHTO).
  - 3. Asphalt Institute (AI).
  - 4. National Crushed Stone Association (NCSA).
  - 5. International Slurry Seal Association (ISSA).
- B. Provide material furnished by a bulk asphaltic concrete producer regularly engaged in the production of hot-mix, hot-laid asphaltic concrete paving materials.
- C. Testing and inspection of bituminous pavement shall be made by an Independent Testing Agency.

#### 1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt material if substrate is wet or excessively damp or if the following conditions are not met:
  - 1. Prime and Tack Coats: Minimum surface temperature of 60 deg. F.
  - 2. Asphalt Base Course: Minimum surface temperature of 60 deg. F. at time of placement.
  - 3. Asphalt Surface Course: Minimum surface temperature of 60 deg. F. at time of placement.

### PART 2. - PRODUCTS

#### 2.1 MATERIAL

##### A. ROADWAY PAVEMENT

- 1. Roadway base to be repaired in kind; if stone base – base to consist of eight (8) inches of dense graded stone, if concrete base – base to consist of six (6) to nine (9) inches of concrete or equal to existing.

2. Pavement of interior parking lot and or dog runs and kennels shall consist of asphaltic concrete with asphaltic concrete binder on eight (8) inches of dense graded stone base where noted.
3. Asphaltic concrete wearing course shall be two (2) inches in thickness when compressed.
4. Asphaltic concrete binder and wearing course mix shall have the following gradation and bitumen requirements:

Percent by Weight

Passing	Binder	Wearing Course
1-1/2 inch	100	-----
1 inch	90-100	-----
1/2 inch	30-55	100
3/8 inch	-----	80-100
No. 4	-----	45-75
No. 8	10-25	35-60
No. 50	-----	6-25
No. 200	-----	2-8
Bitumen	4-6	5-8

5. Base material shall be sound, hard, durable broken stone, free from any organic or other deleterious material and well graded as follows:

Sieve Size	Percent Passing (by weight)
1 inch	100
1/2 inch	75-90
No. 4	40-55
No. 8	30-45
No. 30	16-27
No. 50	12-19
No. 200	3-7 (dry analysis)

**B. STEEL-FACED CURBING**

1. Structural steel as per board of standard specifications 20-S-35 type A-1 (ASTM designation A36).
2. Concrete to be class B-32, air entrained.

**C. CONCRETE SIDEWALK**

1. All materials and construction methods used are to conform to section #4.13 of the bureau of highway operations standard specifications, latest edition.
2. Welded wire fabric, where specified, shall be ASTM designation A-185, gauge #8/8 at 6" x 6" spacing, and conform to section #2.25 of the bureau of highway operations specifications, latest edition.

3. Sidewalk base to consist of gravel or broken stone as per standard specifications.

### PART 3. - EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions where bituminous pavement is to be installed and correct any conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected to permit proper installation of the Work.

#### 3.2 PREPARATION

- A. Proof roll the sub-grade and do all necessary rolling and compacting to obtain firm, even sub-grade surface. Fill and consolidate depressed areas. Remove incompatible materials, replace with clean fill, and compact to 95% of the maximum dry density in accordance with ASTM D 1557.
- B. Frame Adjustment
  1. Verify frames for manholes, catch basins, and other such units, within areas to be paved, are at their proper elevations.
  2. Adjust frames as required to match paving. Provide temporary closures over openings until completion of roller operations. Remove closures at completion of the work. Set covers to grade, flush with the surface of adjoining pavement surface.
- C. Coordinate junction of new and existing pavement. Saw cut existing pavement to provide a uniform straight line transition. Meet existing surface levels and maintain drainage slopes. Feathering of transitions is not acceptable.
- D. Repair existing pavement before installing new surface materials. Cut out depressions a minimum depth of 1" with vertical cuts. Install fresh surface materials and compact with rolling equipment. Feathering of patches is not acceptable. Apply tack coat to contact surfaces of existing pavement, curbs, and structures abutting pavement.

#### 3.3 INSTALLATION

##### A. GENERAL

1. Comply with Asphalt Institute (AI) MS-3 Asphalt Plant Manual for material storage, control and mixing, and for plant equipment and operation.
2. Transport asphaltic concrete mixtures from the mixing plant to the project site in trucks with tight, clean compartments.
3. Thoroughly clean existing pavement surfaces by air blowing, brooming or vacuuming before starting repair or resurfacing operations.

##### B. ROADWAY PAVEMENT

1. Restoration of the existing roadway pavement to be saw-cut to the limit of the new asphaltic concrete wearing course. Remove the existing asphalt between the new curb and the saw-cut line. Replace the existing roadway base (if necessary) adjacent to the new curb and then install the new three (3) inch asphaltic concrete wearing course.
2. The maximum temperature of any batch immediately after mixing shall not exceed 350 degrees F and the minimum temperature of the mixture when delivered to the site shall not be below 250 degrees F.
3. No asphaltic concrete mix shall be spread on the dense graded stone base unless the base is clean and free from water.
4. All utility boxes or valves, all manholes and drains shall be to proper grade before starting the paving work.
5. Rolling of asphaltic concrete shall be done with tandem type power driven rollers weighing not less than ten (10) tons and not less than two hundred twenty five (225) pounds per inch width of main roll.
6. Rolling shall proceed continuously at the following rates: (1) for asphaltic concrete spread by hand, not in excess of 300 square yards per hour per roller, (2) for asphaltic concrete spread by machine, not in excess of 400 square yards per hour per roller.
7. Pavement base shall consist of 4 or 6 inches, in thickness when compressed, of dense grade stone.
8. The spreading of any layer of the base material shall be done with spreader equipment approved by the Commissioner, and shall be spread to such thickness that the maximum depth of the layer, after compaction, will be 4 or 6 inches.
9. When moisture content of the layer is within the limits for proper compaction, the entire surface shall be rolled with a pneumatic tired roller, having an operating weight of between 1,000 and 2,500 pounds per tire, or a smooth steel wheel roller, having a minimum weight of ten tons. Each portion of the layer shall be covered by a minimum of eight passes of the roller.
10. For heavier, vibratory or more efficient types of approved compaction equipment, the minimum number of passes required on all portions of each layer shall be determined by the engineer after appropriate field tests to evaluate the efficiency of such equipment. In limited areas, where the use of a roller is impractical, approved vibrating plate compactors or impact rammers shall be used to compact the material.
11. After compaction, the top surface of this base shall not extend above, nor more than  $\frac{1}{2}$  inch below, true grade and surface at any location. The base, at any location, shall be compacted, finished and completed to the above tolerance and approved by the Commissioner, before any succeeding pavement course is placed at that location. Any depressions or holes shall be filled with the approved coarse sand or screening and the surface re-rolled.



12. Joints: construct joints to ensure continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
  - a. Clean contact surface and apply tack coat.
  - b. Offset longitudinal joints in successive courses a minimum of 6 inches.
  - c. Offset transverse joints in successive course a minimum of 24 inches.
  - d. Construct transverse joints by bulkhead method or sawed vertical face method as described in AI's "The Asphalt Handbook."
  - e. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
  - f. Compact asphalt at joints to a density within 2 percent of specified course density.
  
13. Installation Tolerances:
  - a. Thickness: compact each course to produce the thickness indicated on drawings within the following tolerances:
    - 1) Base Course: Plus or minus 1/4".
    - 2) Surface Course: Plus 1/4", no minus.
  
  - b. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10 foot straightedge applied transversely or longitudinally to paved areas:
    - 1) Base Course: 1/4".
    - 2) Surface Course: 1/4".
    - 3) Crowned Surfaces: test with crowned template centered and at right angles to crown. Maximum allowable variance from template is 1/4".

#### C. STEEL-FACED CURBING

1. Expansion joints in the steel curb facing and concrete backing shall be at a maximum spacing of 24 feet.
2. The expansion joints of the curb and steel curb facing shall line up with the expansion joints of the concrete sidewalks.
3. No piece of steel curb facing having less than two (2) welded dowels may be installed unless it is welded to the adjacent steel curb facing.
4. 1/2" diameter x 5" headed anchor studs (granular or solid flux filled) may be substituted.
5. Surface to be painted shall be thoroughly cleaned and then painted in accordance with DOT specifications, latest revision.

6. Where two (2) pieces of steel curb facing are joined but not welded, two (2) one-half (1/2) inch rods, twenty four (24) inches long shall be inserted into the concrete backing, one-half (1/2) the length at each side of the joint.
7. Splay for steel faced drop curb driveway shall be 2'-6" for commercial application.

#### D. CONCRETE SIDEWALK

1. Sidewalk, outside driveway, and all interior site walkways to be four (4) inch thick concrete atop six (6) inch gravel or broken stone as per standard specification.
2. Sidewalk, in driveway, to be seven (7) inch thick concrete with welded wire fabric #8/8 at 6" x 6" spacing atop six (6) inch gravel or broken stone as per standard specification.

### 3.4 FIELD QUALITY CONTROL

- A. The Contractor shall not commence site disturbance work until:
  1. Builder's Pavement Plan has been approved by the DOB/DOT.
  2. All required permits have been obtained.
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- C. The Contractor is responsible for co-coordinating all the surveying work (stake-out, line and grade, etc.) that is necessary for the work.
- D. All designs, materials, construction methods and workmanship shall comply with the following publications of the bureau of highways: standard specifications, standard details of construction rules of bureau of highways operations: guidelines for the design of infrastructure components.
- E. All non standard materials and construction procedures shall be specifically approved in writing by the DOT.
- F. Any work not complying with the requirements of the DOT shall be removed and replaced.
- G. All sidewalk and street areas constructed under the builder's pavement plan shall remain open to the public at all times.
- H. A construction plan showing maintenance and protection of traffic, including placement of barriers and signage, shall be submitted to the borough highway office before construction begins.
- I. Permits shall be presented from all public agencies and utilities sharing ownership of structures relocated or removed during construction.

- J. All pavement markings including thermoplastic lane divide, removed during construction shall be replaced in kind to the bureau of traffic standards.
- K. The Contractor shall be responsible to retain an independent certified laboratory for testing of any roadway pavement cores and sidewalk concrete cores (if applicable).
- L. The Contractor is to provide manufacturer certification for all types of material used as specified.
- M. Placement, removal, and or replacement of curb trees to be done in strict accordance with the New York City Administrative code section 18-107. Maintain seven (7) feet minimum clearance to curb cut.
- N. Permits are to be obtained by contractor from the New York City Parks Department prior to any tree planting, replacement and or removal.
- O. Installation or relocation of utility poles, hydrants, etc., are to be installed at a minimum clearance or seven (7) feet from a driveway.

3.5 PROTECTION

- A. Protect paving from damage due to construction and vehicular traffic until final acceptance.

3.6 CLEANING

- A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from paving operations.
- B. Sweep pavement and wash free of stains, discolorations, dirt, and other foreign material immediately prior to final acceptance.

END OF SECTION

## SECTION 32 14 13

## PRECAST CONCRETE PAVERS

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the unit pavers as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Precast concrete pavers.
  - 2. Mortar setting bed.
  - 3. Bituminous setting bed.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Concrete slab - Section 03 30 00.
- C. Earthwork - Section 31 20 00.

## 1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: Use only personnel who are thoroughly trained and experienced in the skills required and completely familiar with the requirements established for this work.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Manufacturer's Data: Submit copies of manufacturer's specifications and installation instructions for pavers required. Include data substantiating that materials comply with specified requirements. Indicate that installer has received copy of manufacturer's instructions.
- C. Samples: Submit three sets of 1' x 1' samples of each type and each finish of precast paver. Indicate in each set the full range of exposed color and texture to be expected in the completed work. Commissioner's review will be for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
- 1.6 LEED PERFORMANCE CRITERIA
- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.

- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

#### 1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect pavers during storage and construction against moisture, soiling, staining, and physical damage.
- B. Handle pavers to prevent chipping, breakage, soiling, or other damage. Do not use pinch or wrecking bars without protecting edges of pavers with wood or other rigid materials. Lift with wide-belt type slings wherever possible; do not use wire rope or ropes containing tar or other substances which might cause staining. If required, use wood rollers and provide cushion at end of wood slides.
- C. Store pavers on wood skids or pallets, covered with non-staining, waterproof membrane. Place and stack skids and pavers to distribute weight evenly and to prevent breakage or cracking of pavers. Protect stored pavers from weather with waterproof, non-staining covers or enclosures, but allow air to circulate around units.

#### 1.8 WARRANTY

- A. Provide manufacturer's standard one-year warranty agreeing to replace any pavers that should prove defective within a period of one-year from date of delivery to the site.

### PART 2 PRODUCTS

#### 2.1 UNIT PAVERS

- A. Precast Concrete Pavers: Nominal 24" long x 12" wide x thickness as indicated on drawings, interlocking precast concrete pavers, minimum 8000 psi air entrained concrete, stone aggregate conforming to ASTM C 936. Pavers shall weigh not less than 25 lbs./lin. ft. Pavers shall be manufactured by Hanover, Wausau, Stepstone, or approved equal to match color and blend of approved sample. Basis of design is Hanover Prest Pavers with Tudor Finish, color as scheduled.

#### 2.2 MATERIALS FOR MORTAR SETTING BED

- A. Materials for installing and grouting concrete pavers shall be Portland cement/sand mortar gauged with Latex Setting Liquid and Latex Admixture as manufactured by Laticrete International, Inc., Boiardi, or approved equal.
  1. Portland Cement: ASTM C 150, Type 1; white.
  2. Aggregate for Cement Setting Beds: Sand as recommended in ASTM C 398, uniformly graded from coarse to fine, with 100% passing the No. 4 sieve and not more than 5% passing the No. 100 sieve.
  3. Aggregate for Grout: Sand as recommended in ASTM C 398, uniformly graded from coarse to fine with not more than 5% passing the No. 100 sieve; 100% may pass the

No. 30 sieve, but if the work requires a coarser sand, the coarse sieve size limit may be increased to the No. 16 size. Color as required to obtain selected grout color.

4. Pigments: Commercial iron oxide, manganese dioxide, ultramarine blue, chromium oxide, or carbon black, suitable compounded for use in mortar mixes. Do not exceed pigment-to-cement ratios, by weight of 1-to-35 for carbon black and 1-to-7 for other pigments.
  5. Latex Additives: As manufactured by Laticrete International or Boiardi, provide Laticrete 4237 or Boiardi 753 Setting Liquid and Laticrete 3701 or Boiardi 150 grout and mortar admixture. Installation shall be in strict accordance with manufacturer's instructions.
  6. Water: Potable, clear and free of deleterious materials which would impair the quality of the mortar.
- B. Reinforced mesh where required shall be 2" x 2" x 16 ga. welded galvanized reinforcing mesh.
- C. Sealant and related materials shall conform to the following:
1. For joint filler provide closed cell extruded neoprene gasket conforming to ASTM C 509, grade 4, black.
  2. For sealant, provide a 2-part polyurethane sealant complying with Fed. Spec. TT-S-00227, Class B, Type 2, equal to "HPL" made by Tremco, or approved equal made by Mameco or Pecora. Color of sealant as selected by the Commissioner.
  3. Back-up rod shall be "Ethafoam" or approved equal.
  4. Prime joints using primer recommended by sealant manufacturer.

### 2.3 JOINT TREATMENT

- A. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement, unfading mineral pigments, and white or colored sand as required to produce required color.
1. Latex Additive: Manufacturer's standard water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed sand-portland cement grout.

### 2.4 MATERIALS FOR BITUMINOUS SETTING BED

- A. Primer for Base: ASTM D 2028, cutback asphalt, grade as recommended by unit paver manufacturer.
- B. Fine Aggregate for Setting Bed: Clean, hard sand with durable particles and free from adherent coatings, lumps of clay, alkali salts and organic matters. Aggregate shall be uniformly graded from "coarse" to "fine" and all passing the No. 4 sieve and meet with gradation requirements when tested in accordance with the standard method of test for sieve and screen analysis for fine and coarse aggregates ASTM C 136-67. The dried fine aggregates shall be combined with hot asphalt cement, and the mix shall be heated to approximately 300 degrees F. at asphalt plant. The appropriate proportion of materials shall be seven (7) percent asphalt cement and ninety-three (93) percent sand by weight in the approximate ratio of 145 pounds asphalt to 1,855 pounds of sand. The contractor shall determine the exact proportions to produce the best possible mixture for construction of the bituminous setting bed to meet construction requirements.

- C. Asphalt Cement: ASTM D 946-69A with a penetration at 77 degrees F. 100G., 5 sec of minimum 85 millimeters and a maximum of 100 millimeters.
- D. Neoprene Modified Asphalt Adhesive: Shall consist of two (2) percent neoprene (Grade WM1) oxidized asphalt with a one-hundred-fifty-five (155) degree softening point (80 penetration) and ten (10) percent asbestos free fibers.
- E. Sand for Joints: Fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 sieve and no more than 10 percent passing No. 200 sieve.
  - 1. Provide sand of color needed to produce required joint color.

### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions under which pre-cast concrete pavers are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

#### 3.2 INSTALLATION TOLERANCES

- A. Allowable Variations in Finished Work: Do not exceed the following deviations from level and plumb, and from elevations, locations, slopes, and alignment shown.
  - 1. 1/16" in 10'-0" run, any direction; +/- 1/16" at any location; 1/32" offset at any location.

#### 3.3 INSTALLATION, GENERAL

- A. Do not use pavers with chips, cracks, voids, discolorations, and other defects which might be visible or cause straining in the finished work.
- B. Cut pavers with motor driven saw equipment designed to cut masonry with clean, sharp, unchipped edges. Cut units as required to provide pattern shown and to fit adjoining work neatly. Use full units without cutting wherever possible.
- C. Set pavers in the patterns shown with uniform hand tight joints.
- D. Tolerances: Maintain surface plane for finished floors not exceeding a tolerance of 1/8" in ten (10) feet when tested with a ten (10) foot straightedge.

#### 3.4 INSTALLATION, MORTAR SETTING BED

- A. Application
  - 1. Preparation of Subbase: Clean concrete subbase to remove dirt, dust, debris, film or curing compound, and loose particles. Saturate concrete subbase with clean water several hours before placing setting bed. About one hour prior to placing setting bed, remove surface water.
  - 2. Mortar bed shall consist of the following
    - a. Slurry Bond Coat
      - 1). 1 bag Portland Cement
      - 2). 100 lb. Sand (30-60 mesh)
      - 3). 5 gal. Latex Setting Liquid (adjust quantity to proper consistency)



- b. Joint Grout Mix
  - 1). 1 bag Portland Cement
  - 2). 3 cu. ft. Coarse Sand (ASTM C33)
  - 3). 3 gal. Latex Admix (adjust quantity to proper consistency).

B. Setting

1. The prepared mortar shall be spread to the required thickness. The mortar shall be rodded and compacted with a steel trowel.
2. Before placing the stone on a green or wet screed bed, a slurry coat shall be applied to the mortar bed using a flat trowel. Thickness of the bond coat shall be approximately 1/16". In addition, a skim coat shall be applied to the back of each stone, just prior to placing on the bed.
3. Stone shall be placed in the wet slurry coat before the surface dries. Uniform joints shall be maintained with a nominal width of 1/4".
4. After each piece is laid, it shall be beat in with a wooden block or rubber mallet to level the surface and embed the stone. Bearing shall be done before mortar takes initial set.

- C. Mortar Joints: Joints are 1/4" wide typically. After all units have been set and setting bed is thoroughly cured, brush all 1/4" wide joints clean. Thoroughly wet raked out portion of joints and then fill solid with joint mortar of approved color to match paver. Mortar shall be placed relatively dry and tooled in layers. Finished profile shall be slightly recessed. Grouting of joints as done in tile work is not permitted. Every effort must be made to keep mortar off paver face including applying masking tape to prevent staining of adjacent paver surfaces in continuous strips in alignment with joint edge. Remove tape immediately upon mortar having achieved its finish set.

D. Joint Treatment for Joints to Receive Sealant

1. All exterior control joints as noted on the drawings and all joints in base work shall receive back-up fillers and sealant as specified herein.
2. General: Install all sealant in strict accordance with manufacturer's recommendations as approved by the Commissioner.
  - a. Apply sealant under pressure with a hand or power actuated gun or other appropriate means. Guns shall have nozzle of proper size and provide sufficient pressure to completely fill joints as detailed. Neatly point or tool all joints to provide the contour as indicated on the drawings.
  - b. For application of sealant when air temperature is below 40 deg. F., consult sealant manufacturer for recommendations.
3. Preparation: Thoroughly clean all joints, removing all foreign matter such as dust, oil, grease, water, surface dirt and frost. Sealant must be applied to the base surface. Previously applied paint or film must be entirely removed.
4. Application
  - a. Install back-up material and joint filler, of type and size specified, using a blunt instrument so as not to puncture the surface skin, at proper depth in joint to provide sealant dimensions as detailed. Provide back-up material of suitable size and shape so that, when compressed (25 to 50%) it will fit in joints as

required. Sealant shall not be applied without back-up materials, and, if necessary, bond breaker strip. When using back-up of rod stock, roll the material into the joint to avoid lengthwise stretching. Rod stock shall not be twisted or braided.

- b. Apply masking tape, where required, to prevent staining of adjacent stone surfaces, in continuous strips in alignment with joint edge. Remove tape immediately after joints have been sealed and tooled as directed.
- c. Prime surfaces of all stone to receive sealant.
- d. Apply, tool and finish sealant as required. When tooling light colored sealants, use dry tool or tooling solution recommended by sealant manufacturer.
- e. Clean adjacent surfaces free of sealant or soiling resulting from this work as work progresses. Use solvent or cleaning agent as recommended by sealant manufacturer. All finished work shall be left in a neat, clean condition.
- f. Sealants shall be applied in such a manner as to completely fill the joint.
- g. All sealants shall be tooled to insure complete filling of the joint to eliminate air pockets and voids and to insure positive adhesion of the sealant with the bonding surfaces.
- h. All joints shall be neatly finished.

### 3.5 INSTALLATION, BITUMINOUS SETTING BED

#### A. Application

1. Over concrete sub-slab install the bituminous setting bed, place 3/4" deep control bars directly over the base. If grades must be adjusted, set wood chocks under depth control bars to proper grade. Set two bars parallel to each other approximately eleven (11) feet apart to serve as guides for striking board. The depth control bars must be set carefully to bring the pavers, when laid, to proper grade.
2. Place bituminous bed between the parallel depth control bars. Pull this bed with the striking board over these bars several times. After each passage, low porous spots must be showered with fresh bituminous material to produce smooth, firm and even setting bed. As soon as this initial panel is completed, advance the first bar to the next position in readiness for striking the next panel. Carefully fill up any depressions that remain after removing the depth control bars and wood chocks.
3. The setting bed shall be rolled while hot with a power roller to a nominal depth of 3/4".
4. The elevation shall be adjusted so that when the pavers are placed, the top surface of the pavers will be at the required finished grade.
5. A coating of two (2) percent neoprene modified asphalt adhesive shall be applied by mopping or squeegeeing or troweling over the top surface of the bituminous setting bed so as to provide a bond under the pavers. If it is troweled, the trowel shall be serrated with serrations not to exceed 1/16".
6. When the modified asphalt adhesive is dry to the touch, carefully place the pavers by hand in straight courses with hand tight joints and uniform top surface. Good alignment must be kept, and the pattern shall be that shown on the plans.
7. Newly laid pavers must be protected at all times by panels of plywood on which the installer stands. These panels can be advanced as work progresses. However, the plywood protection must be kept in areas which will be subjected to continued movement of materials and equipment. These precautions must be taken in order to avoid depressions and protect paver alignment. If additional leveling of the pavers is

required, and before sweeping in joint filler, roll with a power roller after sufficient heat has built up in the surface from several days of hot weather.

8. Provide hand tight joints (shall read from 0" to maximum 1/8"). Sweep a dry mixture of one (1) part colored Portland cement to match color of pavers and three (3) parts sand until joints are completely filled. Fog lightly with water. Cement stains that remain shall be cleaned with a ten (10) percent solution of muriatic acid or mortar cleaner.

B. Control and Expansion: Control and expansion joints shall be installed where pavers abut restraining surfaces such as walls, curbs, columns, etc., and directly over any joints in the structural slab and other areas noted on Drawings. Joints shall be filled in accordance with specifications.

### 3.6 REPAIR AND CLEANING (AFTER INSTALLATION)

A. Remove and replace paver units which are broken, chipped, stained, or otherwise damaged. Patching or hiding defects in pavers will not be permitted. Provide new matching units, install as specified herein to eliminate evidence of replacement.

### 3.7 PROTECTION

A. After installation and cleaning, protect pavers from damage during subsequent construction activities.

B. Protect all pavers from other materials that will cause stain. Pavers subject to damage after setting shall be properly covered or protected.

C. At completion of construction work, remove all temporary protection from the work of this Section.

D. Examine all work and repair all damage. Clean soiled or stained surfaces. In the event damage is irreparable, or soiled or stained surface cannot be cleaned, remove and replace such items at no additional cost to the City of New York.

END OF SECTION

## SECTION 32 15 40

## CRUSHED STONE PAVING

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the crushed stone paving and edge treatment as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:
  - 1. Stabilized crushed stone paving.
  - 2. Steel edging.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Concrete work - Section 03 30 00.
- C. Metal Fabrications – Section 05 50 00.
- D. Earthwork – Section 31 20 00.

## 1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: Use only personnel who are thoroughly trained and experienced in the skills required and completely familiar with the requirements established for this work.
- B. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Manufacturer's Data: Submit copies of installation instructions for pavement required. Include data substantiating that materials comply with specified requirements.
- C. Shop Drawings: Submit shop drawings of the paved area, including alignments indicated and details of the Contract plans. Contractor shall field verify dimensions prior to commencement of the shop drawings. Shop drawings shall be detailed noting joint size and pattern in sufficient detail to adequately represent all site conditions for the Commissioner's review and approval.
- D. Samples: Submit samples made up of actual pavements, various sizes, colors and textures required. Include in each set of samples the full range of exposed color and texture to be expected in the completed work.

- E. Samples for Verification: For the following products, in sizes indicated. Prepare Samples from the same material and finish to be used for the Work.
1. 1 pound bag of crushed aggregate screenings.
  2. Submit 6" sample of steel edging.
- F. Field-Constructed Mock-ups:
1. Prior to installation of pavement, fabricate general mock-ups using materials, pattern and joint treatments indicated for project work. Build mock-ups in place at the site, in location indicated or directed, of full thickness and approximately 3' x 3', unless otherwise directed. Mock up shall show the joints (where applicable) and adjacencies of different materials that will be used in the project. Provide range of colors and workmanship to be expected in the completed work. Obtain Commissioner's acceptance of visual qualities of mock-up before completing work. If approved, mock-up can be incorporated into final work. If rejected, mock-up shall be removed from site completely and resubmitted until approved.

## 1.6 PRODUCT HANDLING

- A. Deliver materials to the site, ready for use in the approved manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name, and manufacturer's name. Delivered materials shall be identical to approved samples.
- B. Store all materials under cover in a dry and clean location, off the ground and remove materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials. All materials shall be covered and kept dry.

## 1.7 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## PART 2 PRODUCTS

### 2.1 MATERIALS FOR STABILIZED CRUSHED STONE PAVING

- A. Broken Stone Base Course: Materials for base course shall consist of gravel or stone. Stone shall be well-graded from coarse to fine, clean, hard, and free from foreign matter. It shall be Contractor's responsibility to provide a material which meets this specification and is within the capability to fine grade to the required tolerances. Should the base

course become unstable at any time prior to the placement of the overlying course due to the gradation of the material furnished, the Contractor shall, at his own expense, correct the unstable condition to the satisfaction of the Owner's Representative.

1. Soundness: Material will be accepted on the basis of a Magnesium Sulfate Soundness Loss after 4 cycles of 20 percent or less.
2. Plasticity Index: The Plasticity Index of the material passing the No. 40 mesh shall not exceed 5.0.
3. Elongated Particles: Not more than 30%, by weight, of the particles retained on a ½ inch sieve shall consist of elongated or flat particles. A flat or elongated particle is defined herein as one which has its greatest dimension more than 3 times its least dimension. Acceptance for this requirement will normally be based on a visual inspection by the Owner's Representative. Material with a percentage greater than 30 will be rejected.
4. Gradation: All material shall meet the specified gradation prior to placement on the grade.

<u>Seive Size Designation</u>	<u>Percent Passing by Weight</u>
2 inch	100
¼ inch	30 -65
No. 40	5 - 40
No. 200	0 - 10

B. Crushed Aggregate Screenings – Top Course

1. Clean, hard durable particles of ¼" minus select crushed stone. Fines shall be evenly mixed throughout the aggregate. When produced from gravel, 50 percent by weight of the material retained on a No. 4 sieve shall have one fractured face.
2. The portion retained on the No. 4 sieve shall have a maximum percentage of wear of 50 at 500 revolutions as determined by AASHTO T96-77.
3. The portion passing a No. 40 sieve shall have a maximum liquid limit of 25 and a maximum plasticity index of 7, as determined by AASHTO T89-81 and AASHTO T90-81, respectively.
4. The crushed aggregate screenings shall be free from clay lumps, vegetable material or any other deleterious materials.
5. All stone shall consist of hard, durable, sharp-edged fragments, free from dirt or other deleterious matter, graded within the following limits.

<u>Passing Sieve ( Dry Analysis)</u>	<u>Percent by Weight</u>
3/8 "	100
No. 4	95 - 100
No. 8	75 - 80
No. 16	55 - 65
No. 30	40 - 50
No. 50	25 - 35
No.100	20 - 25
No. 200	5 - 15

6. crushed aggregate screenings with fines shall be as manufactured by George Schofield Co. Inc., 831 Main St., Bridgewater, NJ 08807, tel. (908) 356 0858, or approved equal, supplied in the following materials. Color shall be Plymouth Brown – dolomitic limestone.
- C. Stabilizer: The aggregate binder shall be a natural, non-toxic, non-staining, odorless, environmentally safe powder consisting of 95% Psyllium with a 70% mucillod content. The powder shall be of a size that not more than 10% is retained on a U.S. Standard #40 sieve. The powder binder shall be "Stabilizer" as manufactured by Stabilizer, Inc., or approved equal by TMT Enterprises, Inc.; or approved equal.

## 2.2 MATERIALS FOR STEEL EDGING

- A. Steel edge shall consist of lengths of hot rolled steel sections, one quarter (1/4") inch thick by six inches deep by twenty (20') feet in length. The depth of the steel edge shall be as shown on the plans.
- B. Tapered steel stakes, eighteen (18") inches long, shall be spaced thirty (30") inches on center along the length of the edging. Joints between edging strips shall be overlapped as indicated on the drawings.
- C. Finish shall be galvanized, conforming to Section 05 50 00 .
- D. Steel edging shall be "Commercial Grade Steel Landscape Edging" by Col-Met , "Ryerson Roadway Edging" as manufactured by Joseph T. Ryerson & Son, "Thypin Steel Edge" as manufactured by Thypin Steel Co., "Steel Landscape Edging" by Border Concepts, or approval equal.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine the areas and conditions where pavement is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.
- B. Contractor shall verify dimensions taken at the job site, affecting the work prior to beginning shop drawings for pavement. Bring field dimensions that are at variance to the attention of the Commissioner. Obtain decision regarding corrective measures before start of installation or preparation of shop drawings.

### 3.2 INSTALLATION

- A. General: Coordinate all site activities with other trades and work on the site.
- B. Install the designated foundation base course to depth as noted over the compacted subgrade as per above. Prepare subgrade as per specifications for Earthwork. Take care to protect conduit and work of other trades already in place.
- C. Accurately lay out work to patterns and conditions shown on the drawings and encountered on the site. Fit pavement to adjacent pavements, curbs, ramps and other site features, etc., conforming to the joint width requirements noted on the drawings and



in the shop drawings and special fitting requirements shown on the drawings. Any discrepancies found between field conditions and those shown on the documents must immediately be brought to the attention of the Commissioner.

- D. All pavements shall meet new and/or existing adjacent pavements smoothly and evenly in a flush condition. Keep joints level with abutting joints in the same plane without lipping at joints. Set concrete pavers (alternate) level, unless indicated otherwise on the drawings.
- E. Joints shall be of the widths indicated on the drawings and in the accepted shop drawings.
- F. Cover and protect pavement at all times by panels of plywood on which the installer stands. These panels can be advanced as work progresses. However, the plywood protection must be kept in areas which will be subjected to continued movement of materials and equipment. When not being worked on, unfinished work must be covered with waterproof paper, tarps or other means.

### 3.3 INSTALLATION OF STABILIZED CRUSHED STONE PAVING

- A. Crushed aggregate screenings and Stabilizer shall be pre-mixed under controlled conditions at the stone supplier site prior to delivery to the site for installation. No on site mixing will be permitted.
- B. Fine Grading
  - 1. Before any pavement is placed, the subgrade shall be prepared to line and grade and compacted with an approved roller-type vibratory compactor of at least one ton capacity. Hollows and depressions which develop under rolling shall be filled with acceptable material and shall be repeated until no depressions develop.
  - 2. The Contractor shall remove from the sub-grade all debris, foreign and other undesirable material which interferes with satisfactory construction. The fine grade shall not be muddy or otherwise unsatisfactory when the pavement is placed upon it. If the fine grade becomes rutted or displaced, due to any cause whatsoever, the Contractor shall regrade same without additional payment.
  - 3. Paved areas must drain so that there is not standing water in the paved area.
  - 4. See Section 31 20 00, Earthwork.
- C. Base Course
  - 1. The broken stone for the base course shall be placed by a mechanical spreader or other approved means if placing by a mechanical spreader is impracticable.
  - 2. Compacting Base Course: Before compaction begins, sprinkle the base course with water to dampen it but not drench it and roll it with a compactor as specified above, making a minimum of 4 passes over the base with the vibratory unit operating. After final compaction, the base course shall have a density of not less than 95% and a depth not less than six (6) inches. See Section 31 20 00, Earthwork.
- D. Stabilizer

1. Thoroughly pre-mix Stabilizer with crushed aggregate screenings at the minimum rate of 14.5 lbs of Stabilizer per ton of compacted aggregate screenings (24 lbs per cubic yard of Stabilizer per cubic yard of aggregate screenings). Stabilizer shall be thoroughly mixed at the source of the stone screenings in a controlled and supervised manner. It shall be mixed using a concrete transit truck equipped with the proper internal mixing blades to discharge the material or a mobile mixer with a modified metering unit for Stabilizer. The aggregate must be damp, but not wet, before mixing. In the transit mixer, preload the drum, then as the drum is rotating, add the stabilizer slowly and uniformly to the discharge opening. Mix for a minimum of 15 minutes prior to placing. The mobile has an internal mixing devise which will discharge the material properly mixed.
2. Drop spreading of Stabilizer over preplaced stone screenings and rototilling is not acceptable.
3. Stabilizer shall not be applied during, prior to, or immediately following rainfall or when the temperature is 40 degrees F (5 degrees C) and falling.
4. After mixing, place the Stabilized stone screenings on prepared sub grade and rake smooth using a steel tine rake to the desired grade and cross section. Place to avoid segregation, in one layer. Do not apply deeper than 3 inches in one lift. Example: for a 4 inch thickness, apply in two two inch lifts and allow each layer to dry out after compaction. Compact the material with a one ton compactor as specified above, making a minimum of 4 passes, but do not use the vibratory unit. Hand tamp at edges, around benches, signposts, interpretive exhibits, etc.
5. Water lightly, but thoroughly, to achieve a full depth moisture penetration of the mix. Watering is best accomplished using a garden hose with spray nozzle set to a light spray; pressure should not disturb leveled surface. Water activates the Stabilizer; consequently, it is essential that the full depth of Stabilized paving is saturated. When the water sheen has disappeared and the surface looks damp, roll it again. If by chance the surface lifts (too wet), re-rake the area to a depth of 1 to 2 inches, level with the back of the rake and reroll. Plan the operation so that foot traffic and equipment always is working outside of the installed Stabilized surface course, not in it. After completion, do not allow any traffic of any kind on the finished surface until it is completely dried through – approximately 2 to 3 days. Actual drying time will depend on climatic conditions. The stone paving must dry out completely at one time before being put to use.

#### E. Inspection

1. Finished surface of paving shall be smooth, uniform and solid, with no evidence of chipping or cracking. Dried, compacted paving material shall be firm all the way through with spongy areas. Loose material shall not be present on the surface initially. After, a *minor* amount of loose material is expected on the surface.
2. Loose gravel on the surface, or unconsolidated crushed aggregate screenings below the surface, are evidence of improper bonding due to poor mixing or insufficient watering. Test the loose material for adequate Stabilizer by wetting, then tamping and allowing it to dry. If the material still does not consolidate, Stabilizer was not mixed adequately with the stone screenings. If the material is solid, initial watering was insufficient.
3. Unconsolidated areas shall be dug out and replaced with new crushed aggregate screenings meeting the grading requirements specified above , and mixed with

Stabilizer as specified above. Patched areas shall be wetted thoroughly and rolled smooth. Patching shall be completed prior to any paving smoothing required.

4. Any significant irregularities shall be smoothed out prior to final acceptance of the work. Smoothing shall be accomplished by rewetting/saturating rough areas thoroughly, and rolling the paving again with a heavy roller (200 lbs powered walk-behind or small rider). Wackers are not recommended.
  5. Final thickness of completed paving shall not vary more than  $\frac{1}{4}$  inch from dimension indicated. Measurements may be taken by means of test holes taken at random in finished surface. Correct any variations in the thickness beyond the allowable tolerance by repeating the procedures in Paragraph D, above.
- F. Routine Service: Re-making of surface in small areas where significant disturbances have occurred is best carried out with a hand rake, water and hand tamp.
1. If re-making requires additional "Stabilized" crushed aggregate screenings the repair shall be made as follows: Moisten and scarify the affected areas. Apply "Stabilized" crushed aggregate screenings and grade. Water through full depth of repaired area and compact.
  2. To re-make the whole surface, water and roll at intervals dependent upon intensity of use.

### 3.4 INSTALLATION OF STEEL EDGING

- A. Steel Edge shall be installed true to line and grade in accordance with the designs indicated on the plans. All bends and curves shall be smooth and uniform. Where bends or curves are of such a radius as to make field bending impracticable, they shall be made in the shop. All joints shall be welded as shown on the drawings.

### 3.5 CLEANING AND PROTECTION

- A. Protect all work from misuse or damage after installation has been completed. Work that is damaged will not be accepted by the Commissioner and shall be replaced with acceptable work, or, as approved, repaired, at no additional cost to the owner.
- B. Remove all debris and equipment from the site.

END OF SECTION

## SECTION 32 31 17

## ORNAMENTAL FENCING

## PART 1 GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the ornamental fencing as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:
  - 1. Ornamental steel fencing as indicated on drawings, consisting of tubular frame with decorative infill.
  - 2. Hardware and accessories.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Concrete work - Section 03 30 00.
- C. Metal Fabrications – Section 05 50 00.
- D. Earthwork – Section 31 20 00.

## 1.4 QUALITY ASSURANCE

- A. Provide ornamental fencing as complete units controlled by a single source including necessary erection accessories, fittings, and fastenings.

## 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 018113: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Product Data: Submit manufacturer's technical data and installation instructions for ornamental fencing.
- C. Shop Drawings: Show locations of fence, each gate, posts, rails, and details of gate swing, or other operation, hardware, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, elevations, sections, gate swing and other required installation and operational clearances, and details of post anchorage and attachment and bracing.
- D. Samples for Initial Selection: Manufacturer's color charts or 6-inch (150-mm) lengths of actual units showing the manufacturer's standard range of colors available for components with factory-applied color finishes.
- E. Samples for Verification: For the following products, in sizes indicated. Prepare Samples from the same material and finish to be used for the Work.
1. Submit 10" x 10" fencing sample.
  2. Submit 6" sample of each component of fencing.

## 1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect fencing materials before, during, and after installation to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacement necessary to the acceptance of the Commissioner and at no additional cost to the City of New York.

## 1.7 PERFORMANCE CHARACTERISTICS

- A. Galvanizing: All steel components shall comply with Section 05 50 00, Part 2.3 in Metal Fabrications.

## 1.8 LEED PERFORMANCE CRITERIA

- A. Field applied adhesives or sealants used for work in this section shall meet the requirements of Section 01811313, "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Architectural Coatings" where applicable. Certification of these products shall be in accordance with the LEED Building Submittal Requirements.
- B. All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard, laminate flooring) shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the LEED submittal requirements of Section 013300.
- C. Products harvested, extracted, recovered, as well as manufactured within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.

## PART 2 PRODUCTS

### 2.1 MANUFACTURER

- A. Products specified herein are components of a 'double wire' or 'twin wire' fence system as manufactured by Ametco Manufacturing Corp. 'Park Design', or MetalCo Fence and Rail 'Twinbar', or Deacera/Designmaster 'Contempo', or approved equal.

### 2.2 MATERIALS AND FABRICATION

- A. Fabrication: Fence panel components shall be manufactured using the electro-forged welding process at each crossing.
- B. Configuration: Fence panels and support components shall be fabricated to the configurations of Metalco 'Twinbar' (basis of design).
- C. Steel Bar Stock: ASTM A 36.
- D. Steel Tubing: ASTM A 500, Grade B.

### 2.3 FENCE PANELS - CONSTRUCTION

- A. Steel Mesh Fence Panels: Consisting of prefabricated panels of wire mesh formed by vertical rods placed between two horizontal rods. The rods are electro-forged welded at each crossing. The standard panel length is 8'-3". Heights of more than 8' are

accomplished by combining panels with a different or equal height. Mesh is galvanized after fabrication into panels. Panel sizes indicated on Drawings.

- B. Electro-Forge Welded Steel Fencing: Metalco 'Twinbar' – Mesh size 2"x8" on center; Vertical Rods are 1/4." dia. (4 gauge); Two (2) Horizontal rods are 1/4" dia. (4 gauge). Galvanized to ASTM A 123.

#### 2.4 MISCELLANEOUS ACCESSORIES

- A. Anchors: Anchors fabricated from corrosion resistant materials with capability to sustain, without failure, a load equal to 4 times the load imposed when installed in concrete footings as determined by testing per ASTM E 488.
  - 1. Cast-in-place anchors.
- B. Non-Shrink, Non-Metallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for exterior applications.
- C. Include all required supporting posts. Posts to be 3"x 1-5/8" structural tube as specified by manufacturer to satisfy loading conditions. Galvanized to ASTM A 123.

#### 2.5 FINISHING

- A. Galvanizing: Fence construction shall be hot-dip galvanized in accordance with ASTM A 123.

### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions where ornamental fencing is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

#### 3.2 INSTALLATION

- A. General: Install ornamental fences in accordance with manufacturer's instructions and approved shop drawings. Install fencing on established boundary lines inside property line.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.
- C. Post Setting: Hand-excavate holes for post foundations in firm, undisturbed or compacted soil. Set posts in concrete footing. Protect portion of posts aboveground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Using mechanical devices to set posts is not permitted. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured.
  - 1. Dimensions and Profile: 12" diameter for terminal posts, 10" diameter for intermediate posts. Concrete to be 6" deeper than post length in ground.
  - 2. Exposed Concrete Footings: Extend concrete 2 inches (50 mm) above grade, smooth, and shape to shed water.

3. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.

### 3.3 FENCE INSTALLATION

- A. Terminal Posts: Locate terminal end and corner posts at changes in horizontal or vertical alignment as indicated on Drawings.
- B. Line Posts: Space line posts uniformly as indicated on drawings.
- C. Mesh Panels: Apply panels to inside of enclosing posts. Leave 1 inch between finish grade or surface and bottom of panel, unless otherwise indicated. Anchor panel to posts with pre-assembled mounting brackets. All post-panel connections to utilize a patented nylon setting to reduce rattling noise caused by wind, vibrations or other sources
- D. Fasteners: install nuts on the side of the fence opposite the panel side. Peen ends of bolts or score threads to prevent removal of nuts.
- E. Touch-up any finish damaged during installation with paint supplied by manufacturer and matching original coating.

END OF SECTION



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SECTION 32 84 00  
IRRIGATION SYSTEM

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to locate, furnish, deliver, install and maintain an automatic-control irrigation system as shown on the Drawings and as specified herein.

1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Site Clearing – Section 31 10 00.
- C. Plumbing – Section 22 05 00.
- D. Planting – Section 32 90 00.

1.4 DEFINITIONS

- A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.
- B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.
- C. Irrigation Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.
- D. The following are industry abbreviations for plastic materials:
  - 1. ABS: Acrylonitrile-butadiene-styrene plastic.

2. FRP: Fiberglass-reinforced plastic.
3. PA: Polyamide (nylon) plastic.
4. PE: Polyethylene plastic.
5. PP: Polypropylene plastic.
6. PTFE: Polytetrafluoroethylene plastic.
7. PVC: Polyvinyl chloride plastic.
8. TFE: Tetrafluoroethylene plastic.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. Design 100 percent water-coverage irrigation system for interior plants indicated on drawings and in specification Section 32 90 00.

#### 1.6 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.

- B. Product Data: Include pressure ratings, rated capacities, and settings of selected models for the following as needed:
  - 1. Water regulators.
  - 2. Water hammer arresters.
  - 3. General-duty valves.
  - 4. Specialty valves.
  - 5. Control-valve boxes.
  - 6. Sprinklers.
  - 7. Irrigation specialties.
  - 8. Controllers. Include wiring diagrams.
- C. Shop Drawings: Show irrigation system piping, including plan layout, and locations, types, sizes, capacities, and flow characteristics of irrigation system piping components. Include water meters, backflow preventers, valves, piping, sprinklers and devices, accessories, controls, and wiring. Show areas of sprinkler spray and overspray. Show wire size and number of conductors for each control cable.
- D. Coordination Drawings: Show piping and major system components. Indicate interface and spatial relationship between piping, system components, adjacent utilities, and proximate structures.
- E. Field quality-control test reports.
- F. Operation and Maintenance Data: For irrigation systems, to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section include data for the following:
  - 1. Automatic-control valves.
  - 2. Sprinklers.
  - 3. Controllers.

#### 1.7 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to the Commissioner, and marked for intended use.
- B. Warranty the entire irrigation system and all related equipment and accessories for a period of one (1) year from the date of final acceptance against all defects in workmanship and material.
- C. The warranty period will commence upon final acceptance by the City of New York for a complete system and/or any portion thereof has been put into operation and acceptable to the Commissioner.

#### 1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

## 1.9 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Sprinkler Units: Equal to five (5) percent of amount installed for each type and size indicated, but no fewer than three (3) units.
  - 2. Emitter Units: Equal to five (5) percent of amount installed for each type indicated, but no fewer than three (3) units.
  - 3. Drip Tube Units: Equal to five (5) percent of amount installed for each type indicated, but no fewer than three (3) units.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Provide complete sub-surface multi-zone drip-irrigation system by Rainbird Corporation, or equal by Netafim Irrigation, Rainmaster or approved equal.

### 2.2 MATERIALS

- A. All irrigation equipment is to be provided by an authorized distributor.
- B. All materials and equipment used in the construction work and not specifically noted as being furnished by the City of New York, to be furnished by the Contractor. All materials and equipment furnished by the Contractor to be new, of the kind and type specified, of good quality, and to be delivered to the site in good condition. All materials, whether furnished by the Contractor or by others, to be protected by the Contractor until incorporated in the work and finally accepted by the Commissioner.
- C. All materials to be new and unused. Any equipment or materials found to be defective or not as specified, or approved, to be removed and proper materials to be installed as ordered by the Irrigation Designer.
- D. Controller (s): Controller to be multi-zone controller with integral timer equal or better than Rainbird Model SST400.
- E. Control Valves: Control valves shall be equal or better than Rainbird XCZ-075-PRF, 24V operation.
- F. Dripline: Dripline to be equal to or better than Rainbird XFD Dripline, 17mm insert fittings.
- G. Drip Emitters: Drip Emitters shall be equal to or better than Rainbird XB XX (.66 PH) at spacing to achieve 100 percent irrigation to specified planting.
- H. Pressure Regulator: As required, given inlet pressure at valve (by plumber) and irrigation system requirements.
- I. Provide tubing, pipes, fittings, adapters, tees, soil staples, drain and flush valves, filters as required for a complete and maintainable system.

- J. Control Equipment Enclosure: Provide a steel equipment enclosure with baked enamel finish, with a hinged door and keyed lockable access to contain all exposed equipment. Enclosure shall be anchored to concrete wall as indicated on drawings, using methods as defined in other sections of the specifications.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine the areas and conditions where irrigation system is to be installed. Notify the Commissioner and the City of New York, in writing, of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to both.

#### 3.2 PREPARATION AND LAYOUT

- A. The location of valves and piping are represented schematically in the Drawings. Exact locations of dripline piping, heads, valves, and other components are to be approved by the Commissioner prior to installation
- B. Coordinate irrigation work with planting work so as to have irrigation available at time of plant material establishment.
- C. Coordinate irrigation work with plumbing, electrical and sleeve work.
- D. Final system layout to be acceptable to the Irrigation Designer, Landscape Architect and Commissioner.

#### 3.3 CUTTING AND PATCHING

- A. Methods and materials used for cutting and patching to be acceptable to the Commissioner and per other sections of this specifications and contract.
- B. Materials and finishes for all patching to match existing cut surface materials and finish.
- C. Cut through concrete and masonry with core drills. Jack hammers not permitted.
- D. Seal all openings in walls water tight with link seals.
- E. Sleeves: Coordinate installation of sleeves or openings for all piping passing through concrete planters and steel dividers while the same are under construction.

#### 3.4 INSTALLATION

- A. Drainage: Install irrigation system to allow complete drainage of the system. Provide drain valves as required.
- B. Excavation and Backfill: Provide all excavation, backfilling and compaction required for the proper installation of all piping.

- C. Drip Irrigation:
  - 1. Install drip irrigation as approved in submittals.
  - 2. Install .6 gph drip tubing on plant material and .9 gph drip tubing around trees.
  - 3. Install dripperline piping (2") two inches below finish grade (not below mulch) in shrub beds.
  - 4. Connect dripperline to header and manifold as required.
  - 5. Install flush valve on manifold as required.
  - 6. Staples shall be spaced a maximum of 5 feet and at every fitting to hold the dripperline in place
  - 7. Install indicator stake at all drip irrigation zones in a location approved by the Commissioner.
  
- D. Controllers: Controller shall be wall-mounted and concealed within metal enclosure in location approved by Commissioner. Install controller in accordance with the manufacturer's specifications and connected as to form an operational system. Diagrammatic location shown on the Drawings. Controller shall be installed in accordance with all state and local codes.
  
- E. Electrical: Power to the controller to be supplied from a dedicated circuit and brought to a waterproof receptacle adjacent to the metal enclosure. All wiring to be done in accordance with applicable codes. All surge protection and grounding to be installed in strict compliance with manufacturer's written recommendations and in accordance to applicable codes.

### 3.5 ADJUSTING

- A. Adjust settings of controllers.
- B. Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.
- C. Adjustment of the sprinkler equipment will be done upon completion of the installation, to provide optimum performance and to assure that all sprinklers are properly set to grade.
- D. After the system has been installed, test the entire system and demonstrate that the entire system meets coverage requirements and automatic controls function properly.

### 3.6 CLEANING

- A. Flush dirt and debris from piping before installing sprinklers and other devices.

### 3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain controller and automatic control valves. Refer to DDC General Conditions for closeout procedures.

END OF SECTION

## SECTION 32 93 00

## PLANTING

## PART 1 – GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to locate, furnish, deliver, install and maintain all landscaping work as shown on the Drawings and as specified herein, including but not limited to the following:
  - 1. Exterior plantings including street trees, on-site trees, vines, and ferns
  - 2. Interior plantings including bamboo and ground cover
  - 3. Inspection of each site, interior and exterior, for sub-surface conditions to insure compatibility with specifications for planting
  - 4. Staking of Street trees
  - 5. Topsoil and planting mixes for interior and exterior planting areas and tree pits as specified
  - 6. Amending topsoil in planted areas, as noted on the plans and in the specifications.
  - 7. Tree Restitution to NYC Department of Parks for the removal of large Ailanthus tree from sidewalk east of the existing library building (near new column line 4.8).

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Site Clearing – Section 31 10 00.
- C. Earthwork – Section 31 20 00.
- D. Irrigation System – Section 32 84 00.
- E. Storm Drainage Utilities – Section 33 40 00.

## 1.4 REFERENCES AND STANDARDS



- A. American National Standards Institute, Inc. (ANSI): Z60.1 American Standard for Nursery Stock (Sponsor: American Association of Nurserymen, Inc.), latest edition.
- B. American Society for Testing and Materials (ASTM): C136 Sieve Analysis of Fine and Coarse Aggregates, F405 and F667 Perforated Polyethylene Pipe, D1682 Filter Fabric, latest edition.
- C. ASTM-E11 Wire-Cloth Sieves for Testing Purposes
- D. Comply with all rules, regulations, laws and ordinances of the State of New York and all authorities having jurisdiction. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided without additional cost to the City of New York.
- E. Nomenclature: Plant names shall agree with the nomenclature of "Standardized Plant Names" as adopted by the American Joint Committee on Horticultural Nomenclature, Latest Edition. Names of varieties not listed therein shall conform with names generally accepted in the nursery trade. Clonal types must be true. No substitutions will be permitted except by written permission of the Commissioner.
- F. Federal Specifications (FS): O – F 241D, Mixed Commercial Fertilizer (for interior planting only)
- G. Grading of interior plant material shall be in accordance with the State of Florida Department of Agriculture "Grades and Standards for Nursery Plants," and shall be Florida fancy or Foliage No. 1 grade as described in the "Interior Plant Specifications" section of *Guide to Interior Landscape Specifications*, 5<sup>th</sup> Edition, 2003, published by the Associated Landscape Contractors of America (ALCA), hereinafter referred to as the "ALCA Guide."
- H. Nomenclature for interior plants: Names of interior plants required under this contract shall conform to those given in the ALCA Guide. Names of varieties not included therein shall conform to names given in the current edition of "Standardized Plant Names" prepared by the American Joint Committee on Horticultural Nomenclature or those names generally accepted in the nursery trade.
- I. All interior plant material shall comply with state and federal laws, including quarantines with respect to inspection, plant diseases, and insect infestation.
- J. Comply with all federal and state Department of Agriculture regulations for pest control for interior plants that, in general, require that Contractors operating in infested areas thoroughly clean all equipment units before moving them to non-infested areas.

#### 1.5 SPECIAL REQUIREMENTS

- A. The following items must be given special attention by the Contractor:
  - 1. The subgrade must be graded smooth, compacted and at the proper elevation as per the Drawings and positively drained before beginning work under this Section.
  - 2. If trees and shrubs are to be planted in the same bed, tree balls shall be placed directly on the compacted subgrade and backfilled to the level of the bottom of the shrub root balls. The sequence of construction will be coordinated to avoid pit excavation wherever possible. It is the intention of this contract to minimize the

interface between the subgrade soil and topsoil in order to provide consistent soil textures throughout the project.

3. The layout at paving edges shall be approved in the field by the Commissioner in order to achieve an accurate and consistent placement of the plantings and paving material. To the greatest degree possible, stakes shall be protected during construction.
4. Soil sample analysis shall be made for subgrade material immediately before adding topsoil or planting soil mix. Laboratory analysis shall include physical properties, organic matter content, tests for soluble salts and other toxic elements detrimental to plant growth. If the analysis proves that subgrade materials would be detrimental to plant growth, and if additives cannot correct this situation, then the Commissioner will require the removal of this material to a depth below potential root growth.
5. Sample analyses shall be made for all topsoil and planting and topdressing soil mixes proposed for use on this project. Additives for pH and other properties are often temporary and mixing procedures are often inadequate; therefore, insofar as possible, topsoil and components of planting soil mix shall be obtained which meet specifications without adjustment by additives.
6. Provide protection during installation and maintenance of protective devices for trees in close proximity to construction.
7. Trees and other plant material that cannot be planted as soon as they arrive on site must be mulched to the top of the root ball and watered as necessary to maintain the best possible plant health. Bare root plant material shall be stored on site in shade and watered at least every two hours.
8. All planting shall be performed after rain, or when the soil is sufficiently moist as approved by the Commissioner.
9. Water as necessary to maintain plant health.
10. Wash plant material as necessary to prevent dust and other pollutants from building-up on leaves.

B. Tree Resititution:

1. Contractor shall include Tree restitution to the New York City Department of Parks and Recreation for the removal of the large Ailanthus tree from the sidewalk east of the existing library building (near new column line 4.8). The Contractor shall provide the following:
  - a) Payment to the New York City of Parks and Recreation in the amount of thirteen thousand and fifty dollars (\$13,050).
2. Prior to tree removal, contractor must receive removal permit from Queens Forestry, and for planting in parks a Tree Planting Permit from Queens Forestry.

1.6 QUALITY ASSURANCE

- A. All work under this Section shall be performed by personnel totally familiar with planting work and under supervision of an experienced Landscape Foreman at all times.
- B. Selection of Plant Materials:
  1. The Contractor shall submit to the Commissioner the name and location of nurseries which he/she proposes to use as sources of acceptable plant material. The Contractor shall personally inspect all nursery materials to determine that the

materials meet the requirements of this Section. Proposed materials shall be tagged at the nurseries by the Contractor prior to viewing by the Commissioner.

2. The Contractor shall schedule with the Commissioner a time for viewing plant material at the nursery. Trips to nurseries shall be efficiently arranged to allow the Commissioner to maximize the viewing time. A minimum of six (6) weeks shall be allowed for this viewing prior to time that plants are to be dug.
3. The Commissioner must attach approved seals to each plant or to representative samples, unless otherwise indicated.
4. Where requested by the Commissioner, photographs of plant material or representative samples of plants shall be submitted.
5. Viewing and/or sealing of plant material by the Commissioner at the nursery does not preclude the Commissioner's right to reject material at the site of planting.
6. All plants shall be subject to tailgate inspection upon arrival. Any plant which fails to meet these specifications shall be rejected.

C. Substitution

1. Before changes or substitutions are made due to unavailability of plant material, the Contractor shall submit satisfactory evidence that he/she has advertised for a one (1) month period in a trade journal such as the "Landscape Materials Information Service", with no response, or has undertaken other methods of locating plant material acceptable to the Commissioner.

D. Contractor Qualifications for Interior Plantings

1. Installer qualifications: Work covered shall be performed by a single firm experienced in interior landscape installations and maintenance of a similar nature and scope.
2. Contractor's firm shall meet the following requirements:
  - a. Has completed within the past three (3) years of similar nature and scope to the work being bid, and the type of work completed is similar to that being bid.
  - b. Maintains a permanent place of business, with a minimum of three (3) years in business.
  - c. Has access to all necessary equipment and has organizational capacity and technical competence necessary to do the work properly and expeditiously.
  - d. The Contractor for work under this section shall be licensed by the State of New York to apply insecticides approved for use indoors in the State of New York.
  - e. Has a record of satisfactorily completing past projects:
    1. Completed past contracts in accordance with the contract documents
    2. Diligently pursued execution of the work and completed past contracts according to the established time schedules
    3. Fulfilled guarantee requirements of past projects
3. Qualifications of Workers
  - a. Contractor's firm shall have in its employ:
    1. Certified Landscape Professional (CLP): A minimum of one (1) as currently recognized by the Associated Landscape Contractors of America (ALCA). The statement shall include the seal, signature, and the expiration date of the certification of the CLP on the staff of the bidding firm.
    2. Interior Landscape Installation Manager: A minimum of one (1) person present at all times during execution of the work who is thoroughly familiar with the type of materials being installed and the proper equipment and methods required for their installation to direct all work

performed under this section. This person shall have experience in handling the specified materials, and in sizes specified, in installations of similar scope.

3. Certified Landscape Technician (CLT): A minimum of one (1) as recognized by ALCA shall supervise maintenance. The statement shall include the seal and signature and expiration date of the certification of the CLT on the staff of the Contractor.

## 1.7 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.  
The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:
  1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
    - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
    - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
    - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
    - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
    - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
  2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
  3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
  4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.
- B. Samples: The following samples shall be submitted:
  1. Shredded hardwood bark mulch: One cubic foot
  2. Topsoil: One (1) cubic foot
  3. Planting Soil Mix: One (1) cubic foot

- a. Do not combine planting soil mix until approved in writing by the Commissioner.
  - b. After planting soil mixing operations have been completed, samples shall be submitted for laboratory analysis. Submit test results to the Commissioner for approval.
  4. Leaf Mold: One cubic foot
  5. Cedar stake: one (1) complete
  6. Tree Gator: one (1) complete
  7. Mycor Tree Saver, or approved equal mycorrhizal fungal transplant inoculant
  8. For interior planting: For each type of mulch, gravel, peat moss, and exposed planting material required, 1 lb (0.45 kg) in weight.
- C. Submit certified reports by an approved testing agency indicating compliance with the specifications for topsoil and planting soil and topdressing mixes. Recommendations shall be made by the testing agency as to the type and quantity of soil additives required to bring topsoil and planting soil and topdressing mixes into compliance with the Specifications.
- D. Manufacturer's Product Data: Manufacturer's product data shall be submitted for the following materials:
1. Aluminum sulfate
  2. Antidesiccant
  3. Organic fertilizer
  4. Bone meal
- E. Certificates: Labels from the manufacturer's container certifying that the product meets the specified requirements shall be submitted for the following materials:
1. Organic fertilizer
  2. Bone meal
  3. Limestone
- F. Submit results of tests by approved testing laboratory for any sand as required to bring either planting soil mix or subgrade material into conformance with the Specifications. Tests shall include mechanical and chemical analysis.
- G. Review by the Commissioner of samples of topsoil, mulch, plant material or any other materials at the source of supply, or other samples or certificates prior to delivery shall not constitute final acceptance. The Commissioner reserves the right to reject on or after delivery any topsoil, mulch, plant material, or any other material which does not, in his opinion, meet the requirements of these Specifications. Any rejected material shall be removed from the site at the Contractor's expense.
- H. Landscape Material/Source Lists: Within five (5) days after award of the contract, the Contractor shall submit landscape material and source list demonstrating conformance with the requirements specified and as outlined below:
1. Provide at least one 35-mm color print or digital photographic record of each of the actual specimen trees proposed for this project (as opposed to photographs of typical samples).
  2. Sources for all landscape materials to be furnished by the Contractor, including name and address of each source, name of contact person, telephone number, and fax number.
- I. Planting Schedule: Indicating anticipated planting dates for all plants.

- J. Maintenance Schedules during Guarantee Period: The Contractor shall submit to the Commissioner for approval the proposed maintenance schedule, specifying personnel, materials and equipment required to comply with the maintenance provisions specified herein. The work in the proposed schedule shall commence two (2) weeks from the date of acceptance.

#### 1.8 OWNER'S INSPECTION AND TESTING

- A. Work will be subject to inspection at all times by the Commissioner. The Commissioner reserves the right to engage an independent testing laboratory to analyze and test materials used in the construction of the work. Where indicated by the Commissioner, the testing laboratory will make material analyses and will report to the Commissioner whether materials conform to the requirements of these Specifications.

1. Testing equipment will be provided by and tests performed by the testing laboratory. Upon request by the Commissioner, the Contractor shall provide such auxiliary personnel and services needed to accomplish the testing work.

#### 1.9 DELIVERY, STORAGE AND HANDLING

- A. Digging B&B Plant Material: Plants shall not be dug at the nursery until the Contractor is ready to transport them from their original locations to the site of the work or acceptable storage location.

- B. Transportation of Plant Material:

1. Plants transported to the project in open vehicles shall be covered with tarpaulins or other suitable covers securely fastened to the body of the vehicle to prevent injury to the plants. Closed vehicles shall be adequately ventilated to prevent overheating of the plants.
2. Plants shall be kept moist, fresh, and protected at all times. Such protection shall encompass the entire period during which the plants are in transit, being handled, or are in temporary storage. The roots of all trees, shrubs, vines, ground covers, ferns, grasses and perennials shall be protected from drying out with wet straw or other suitable material while in transit. At no time shall they be exposed to the sun.
3. Deliver seed in original sealed, labeled, and undamaged containers.
4. Unless otherwise authorized by the Commissioner, the Contractor shall notify the Commissioner at least two working days in advance of the anticipated delivery date of any plant material. Contractor shall inform the Commissioner of plant types and quantities in said delivery. A legible copy of the bill of lading, showing the quantities, kinds, and sizes of materials included for each shipment shall be furnished to the Commissioner.

- C. Storage:

1. Unless specific authorization is obtained from the Commissioner, plants shall not remain on the site of work longer than three days prior to being planted.
2. Plants that are not planted immediately shall be protected as follows:
  - a. Earth balls shall be kept moist and their solidity carefully preserved.
  - b. Plants shall not be allowed to dry out or freeze.
  - c. Ground cover, grasses, perennial and fern pots and flats, plugs, and all other containers shall be protected from sun and kept moist.
  - d. Bare root plants shall be protected from sun and kept moist.

- D. Handling of Plant Materials: Contractor shall exercise care in the handling of plant materials to avoid damage or stress.
- E. Plants shall be sprayed prior to shipping with antidesiccant to prevent drying out during trucking and handling.
- F. Contractor is responsible for damage to property caused by planting operations; all areas and construction disturbed shall be restored to their original conditions to satisfaction of the Commissioner.
- G. For interior planting: the Contractor shall not commence work at the project premises until such time as the premises' permanent HVAC system is in reasonably normal operation, hot and cold running water exists at permanent mixing faucets within reasonable proximity to the planting area(s), and all construction over the immediate work area(s) is complete. Further, the Contractor shall not transport plants or work in environmental conditions that may be detrimental to plant survival.

#### 1.10 REJECTION OF MATERIALS

- A. Evidence of inadequate protection following digging, carelessness while in transit, or improper handling or storage shall be cause for rejection.
- B. Upon arrival at the temporary storage location or the site of the work, plants shall be inspected for proper shipping procedures. Should the roots be dried out, large branches be broken, balls or earth broken or loosened, or areas of bark be torn, the Commissioner will reject the injured plant.
- C. When a plant has been rejected, the Contractor shall at once remove it from the area of the work and replace it with one of the required size and quality.

#### 1.11 ACCEPTANCE

- A. The Commissioner will inspect all work for substantial completion upon written request of the Contractor. The request shall be received at least ten calendar days before the anticipated date of inspection.
- B. Acceptance of plant material by the Commissioner will be for general conformance to specified size, character and quality, and shall not relieve the Contractor of responsibility for full conformance to the Contract Documents.
- C. Upon completion and re-inspection of all repairs or renewals necessary in the judgement of the Commissioner, they will recommend that acceptance of the work of this Section be given.
- D. Acceptance of the work will begin the two year guarantee period as specified below.
- E. Acceptance in Part:
  - 1. The work may be accepted in part when it is deemed to be the Commissioner's best interest to do so, and when permission is given to the Contractor in writing to complete the work in parts.
  - 2. Acceptance and use of such areas by the Commissioner shall not waive any other provisions of this Contract.

#### 1.12 GUARANTEE SERVICE

- A. The Contractor shall be responsible for the maintenance of the plant material until the completion of the guarantee period and Final Acceptance of the work. Guarantee Service shall be as described in Part 3 of this Section of the Specifications.

#### 1.13 GUARANTEE

- A. Balled and burlapped trees and container plants shall be guaranteed for a period of two (2) years after the date of Acceptance by the Commissioner.
  - 1. When the work is accepted in parts, the guarantee periods shall extend from each of the partial acceptance to the terminal date of the last guarantee period. Thus, all guarantee periods shall terminate at one time.
- B. Plants shall be healthy, free of pests and disease, and in flourishing condition at the end of the guarantee period. Plants shall be free of dead and dying branches and branch tips, and shall bear foliage of normal density, size, and color.
- C. All dead plants and all plants not in a vigorous, thriving condition, as determined by the Commissioner during and at the end of the guarantee period, shall be replaced by the Contractor, without cost to the City of New York, as soon as weather conditions permit and within the specified planting period.
  - 1. Replacements shall closely match adjacent specimens of the same species and shall be subject to all requirements stated in these Specifications.
  - 2. The Contractor shall make all necessary repairs due to plant replacements. Such repairs shall be done at no extra cost to the City of New York.
  - 3. The guarantee of all replacement plants shall extend for an additional one year period from the date of their acceptance after replacement.

#### 1.14 FINAL INSPECTION AND FINAL ACCEPTANCE

- A. At the end of the guarantee period, the Commissioner will, upon written request of the Contractor, inspect the work for Final Acceptance. Request shall be received at least ten (10) calendar days before the anticipated date for Final Inspection.
- B. Upon completion and re-inspection of all repairs or replacements necessary in the judgement of the Commissioner, the Final Acceptance of the Work of this Section will be given.

#### 1.15 COORDINATION AND SCHEDULING

- A. Coordinate installation of planting materials with the work of other trades.
- B. Coordinate installation of plants during normal planting seasons for each type of plant required.

### PART 2 – PRODUCTS

#### 2.1 EXTERIOR PLANTS

- A. Except as otherwise specified, size and grade of plant materials shall conform to ANSI Z60.1. Where size exceeds that indicated in ANSI Z60.1, the ball size shall be



proportionately larger. Contractor shall verify that adjacent construction will accommodate ball size and report any discrepancies to the Commissioner.

B. Measurement of Plants:

1. Trees, shrubs and other plants shall be measured in units of caliper, height or spread called for on the plans. The caliper, height or spread shall be a fair average between the minimum and maximum sizes specified, although the Contractor may, at his option and with the approval of the Commissioner, supply oversize plants, provided that this does not affect the Contract price. The Contractor shall verify that larger root balls will fit into spaces provided by adjacent construction. Large plants or root balls cut back to sizes specified will not be accepted.
2. The caliper, height or spread and quality shall be measured in accordance with standards specified in the current American Association of Nurserymen, Inc. American Standard for Nursery Stock, unless otherwise specified.
3. Each plant shall be dimensioned as it stands in its natural position.
4. Deciduous trees (unless a caliper is specified), deciduous shrubs, and evergreen shrubs of an upright type shall be measured in units of average height in feet.
5. Evergreen and deciduous shrubs of a spreading type shall be measured in units of average spread in inches.
6. Vines, ground covers and/or perennials, grasses and ferns shall be measured by container size, root pot size, length of runners and/or age as specified.
7. The minimum sizes and root balls, ball depth and diameters, and increased ball sizes for collected stock shall be in accordance with "Recommended Balling and Burlapping Specifications," as set forth in the current edition of American Standard for Nursery Stock, sponsored by the American Association of Nurserymen, Inc. Balling and burlapping of material to be transplanted shall conform to these standards.

C. Balled and burlapped plants shall have outstanding form; they shall be symmetrical, heavily branched with an even branch distribution, densely foliated and/or budded, and a strong, straight, distinct leader where this is characteristic of species. The Commissioner will be the final arbiter of acceptability of plant form.

D. Plants shall be healthy and vigorous, free of disease, insect pests and their eggs, and larvae.

E. Plants shall have a well-developed fibrous root system.

F. Plants shall be free of physical damage such as scrapes, broken or split branches, scars, bark abrasions, sunscalds, fresh limb cuts, disfiguring knots, or other defects.

G. Plants shall meet the sizes indicated on the Plant Schedules. Plants larger or smaller than specified may be used only if accepted by the Commissioner.

H. Where a size or caliper range is stated, at least 50 percent of the material shall be closer in size to the top of the range stated.

I. Plants shall not be pruned before delivery, unless approved by the Commissioner in writing. Any pruning of trees or shrubs to accommodate structures shall be done by qualified personnel after installation and under direction of the Commissioner.

J. All trees and shrubs shall be labelled with botanical name, common name and variety. Labels shall be durable and legible, stating the correct plant name and size in weather

resistant ink or embossed process. Labels shall be securely attached to all plants prior to delivery to the site, being careful not to restrict growth.

- K. Plants indicated as "B & B" shall be balled and burlapped.
  - 1. Unless otherwise permitted by the Commissioner, plants shall be nursery grown.
  - 2. Plants shall be grown for at least two years under climatic conditions similar to those in the locality of the project.
  - 3. Nursery grown plants shall be freshly dug. No heeled in plants or plants from cold storage will be accepted, unless otherwise permitted by the Commissioner.
  - 4. Burlap shall not extend above the flare of the trunk, which shall be exposed.
  
- L. Container grown plants shall be well rooted and established in the container in which they are growing. They shall have grown in the container for a sufficient length of time for the root system to hold the planting medium when taken from the container, but not long enough to become root bound. Container grown plants exceeding the sizes indicated in ANSI Z60.1 shall have containers which are not less than 75 percent of the ball sizes for comparable B&B plant material.

## 2.2 INTERIOR PLANTS

- A. Each specimen shall be nursery grown.
- B. Standards: Specimens shall be true to names and sizes and shall conform to the following standards:
  - 1. For Nomenclature: Names of plants required under this contract shall conform to those given in the ALCA Guide. Names of varieties not included therein shall conform with names given in the current edition of "Standardized Plant Names" prepared by the American Joint Committee on Horticultural Nomenclature or those names generally accepted in the nursery trade.
  - 2. For Sizes: The ALCA Guide.
  - 3. For Cultural Requirements: *Guidelines to Foliage Plant Specifications for Interior Use*, Florida Foliage Association, 1978.
  - 4. For Quality Standards: All specimens shall be Florida Fancy or Florida No. 1 as per *Grades and Standards for Nursery Plants, Parts I and II*, Florida Department of Agriculture and Consumer Services, 1975.
- C. The Contractor shall provide plants, unless specified otherwise, of a quality and size equal to or surpassing Foliage No. 1 grade as described in the "Interior Plant Specifications" section of the ALCA Guide.
- D. All plants provided under this Agreement shall have been established in their present growing containers for at least six (6) months prior to installation.
- E. No interior plant(s) provided under this Agreement shall be accepted that require permanent staking in order to maintain an upright position.
- F. The Contractor shall provide all plants for existence within the project premises already acclimated to lower light, moisture, humidity, and fertilization levels in conformance with accepted industry standards and as recommended in the "Plant Schedule on the Drawings or the ALCA Guide.
- G. Plants shall be free from disease and pest infestation that could, by their presence, induce or contribute to the decline of the plant. Plants shall be of a normal growth habit

for the species; however, naturalistic forms of plant materials are preferred to highly pruned and shaped forms.

- H. Plants shall have well-developed root systems, and on inspection shall be found to be free of pests and/or disease. The roots shall be well distributed throughout the container such that they visibly extend on all sides to the inside face of the growing container. Conversely, the root formation within the container shall not have developed to the point where it becomes excessive (i.e., "pot-bound") and prohibits water from permeating to the fine water-absorbing root hairs. All plants larger than that specified in the Plant Schedule on L-101 provided under this Agreement shall have been established in their present growing containers for at least six months prior to installation.
- I. Plant root systems shall afford firm support and insure physical stability of the plant parts above the planting medium. The root system shall maintain life systems required to produce vigorous, healthy growth. If a larger container is required than what was specified in the Plant Schedule, the Contractor shall contact the Commissioner to get written approval for changing to the appropriate container size.
- J. Foliage must be present in such quantity as may be required to produce an appearance representative of the species.
- K. Plant materials must be reasonably free of conspicuous scarring evidence. Scars, conspicuous or not, must be completely healed, providing no point of entry for deleterious pathogens or boring insects. There must be no splitting of canes or branching points.
- L. Dead wood and all stubs resulting from pruning must be removed.
- M. Plants shall be pruned according to the Commissioner's direction and in accordance with standard horticultural practice to preserve the natural character of the plant. Only clean, sharp tools shall be used.
- N. Plants must be free of any chlorosis, yellowing, or poor chlorophyll formation and be turgid and substantially erect as well as substantially free of blemishes resulting from mechanical, chemical, pathological, or pest-induced damage.
- O. Plant materials must be reasonably free of dust, pesticide, and water-borne residues. This shall include products specifically formulated as leaf polish. Combination foliage cleansers and polishes are acceptable.
- P. See the "Plant Schedules" on the Drawings for additional comments regarding each plant specified.
- Q. Specimen plant materials shall be labeled with a durable, legible label stating the correct plant name and size in weather-resistant ink or embossed process. Attach labels securely to all specimens delivered, being careful that labels attached directly to plants will not restrict growth or have a deleterious effect on the plant.
- R. If required by law, all specimens shall show individual certificates of inspection by the agricultural department of the state of origin.

### 2.3 INTERIOR PLANT SIZES

- A. Measurements: Number of canes per pot specified shall be the minimum acceptable. Foliage width and origin shall be measured across mean foliage width dimension, not

including random outstanding branches. Foliage origin along a main trunk, cane or stem shall be measured from soil line.

- B. All plants shall conform to the measurements specified in the plant schedules. Plants shall be selected by height or spread or grow-pot size as indicated in the plant schedules. In the event the Contractor wishes to provide plants that do not meet specifications, proof of unavailability and proposed substitutions shall be submitted to the Commissioner for approval.
- C. All bamboo indicated as "matched specimens" must be installed at the same height and spread, plus or minus ten percent (10%) of the appropriate dimension.
- D. In the event plants are tagged more than two months prior to installation, the height of the plants as tagged may be less than the specified height if, in the opinion of the grower, the specimens will attain the specified height prior to installation. Should any plant not attain the specified height at the time of the installation, the Commissioner reserves the right to reject the plant as failing to meet size specifications.

#### 2.4 ACCESSORY MATERIALS FOR INTERIOR PLANTS

- A. Filter Fabric: Shall be a woven monofilament polypropylene polymer and used according to manufacturer's directions.

#### 2.5 PLANT SPECIES, INTERIOR AND EXTERIOR

##### A. Interior

1) *Fargesia scabrida* (Clumping Bamboo): Clumping non-invasive bamboo, located in Interior Courtyard planter; 4 – 6 ft tall; 12 - 16ft maximum height; #5 containers, located in groupings in the planter as shown in the plans

2) *Saxifraga sarmentosa* (Strawberry Begonia): Low perennial flowering ground cover; Located in Interior Courtyard planter adjacent to the bamboo; 2" pots, @ 8" o.c.

##### B. Exterior

1) *Magnolia virginiana* (Sweet Bay Magnolia): Flowering multi-stem tree, located in Rear Yard; Balled and burlap; 8ft - 10ft tall clump; Quantity: 1

2) *Aristolochia tomentosa* (Wooly Dutchman's Pipe): Twining vines planted along perimeter of Rear Yard to grow up and around fence; 2 gallon containers planted as shown on plan.

3) *Dennstaedtia punctilobula* (Eastern Hayscented Fern): Perennial fern, located in Rear Yard; 1 gallon container, @ 18" o.c.

4) *Osmunda cinnamomea* (Cinnamon Fern): Perennial fern, located in Rear Yard; 1 gallon container, @ 18" o.c.

5) *Polystichum acrostichoides* (Christmas Fern): Perennial fern, located in Rear Yard; 1 gallon container, @ 18" o.c.

#### 2.6 TOPSOIL

A. Unscreened Topsoil shall be natural loam topsoil (approximately 40% sand, 40% silt and a maximum of 20% clay), free from subsoil, obtained from an area which has never been stripped or treated with an herbicide and from a depth of no more than 1 foot, or less if subsoil is encountered, supplier certified as having been obtained from an area which has never been treated with herbicide and conforming to the following:

1. It shall be of uniform quality, free from hard clods, stiff clay, hard pan, sods, partially disintegrated stone, lime, cement, ashes, slag, concrete, tar residues, tarred paper, boards, chips, sticks or any other undesirable material.
2. It shall contain a minimum 6 percent organic matter as determined by loss on ignition of moisture-free samples and the pH range shall be pH 6.0 to pH 7.0 inclusive.
3. The soluble salts range shall be equal to or less than 1500 micromhos per centimeter.
4. The samples taken shall be in accordance with paragraph 1.6, QUALITY ASSURANCE, and will be tested as follows:

Sieve Analysis (By Wash Test. ASTM Designation D-1140)

Passing	Retained On	Percentage
1" Screen		99%
1" Screen	1/4" Screen (gravel)	0-5%
1/4" Screen No. 100	USS mesh sieve (sand)	40-60%
No. 100 USS	Very fine sand, silt and clay	40-60%

5. The percentage of clay shall be a maximum of 20 percent.
6. When the topsoil otherwise complies with the requirements of the specification but shows a deficiency of not more than one (1) percent in organic matter content, humus, or other approved organic matter may be incorporated when and as permitted by the Commissioner.
7. Definitions of sand, silt and clay shall be those used by the Association of Official Analytical Chemists.

2.7 PLANTING SOIL MIX FOR EXTERIOR PLANTING

- A. Planting soil mix is composed of topsoil, various soil amendments and nutrient control materials.
1. It shall contain a minimum of 12 percent organic matter as determined by loss of ignition of moisture free samples and the pH range shall be 5.0 to 7.0 inclusive. Additives and methods of incorporation to achieve this pH range shall be approved by the Commissioner.
  2. The soluble salts range shall be equal to or less than 1500 micromhos per centimeter.
  3. The samples taken shall be in accordance with paragraph 1.6, QUALITY ASSURANCE and will be tested for 95 percent passing a 1" screen.
- B. Planting soil mix shall consist of the following:
1. Each 5 cubic yards of mix shall contain:
    - 4 cubic yards of Topsoil

1 cubic yard of well rotted manure  
5 pounds of bonemeal

- C. Topsoil shall be loose, friable and not frozen or saturated at the time of mixing.

2.8 PLANTING MEDIUM FOR INTERIOR PLANTING

- A. Planting Medium: Shall be a sterilized, soilless growing media. Its formulation shall contain approximately 50 percent Canadian sphagnum peat, 35 percent composted fir bark, 15 percent sand, plus wetting agent and nutrient package. A premixed, proprietary planting medium specifically formulated for interior plants is acceptable, with the following provisions:

- 1. Premixed proprietary planting medium shall be accepted provided the Contractor submits to the Commissioner and or Interior Landscape Designer for approval a list of the ingredients and the approximate percentage of each by volume and receives the Commissioner and/or Interior Landscape Designer's approval in writing prior to the commencement of planting operations.

- B. Intermediate Layer Mix: Shall consist of 50 percent planting medium as specified above and 50 percent sand, blended on-site or as approved by Commissioner.

- C. Peat: Shall be choice cut, milled, Canadian brown sphagnum peat, free of woody materials and of mineral matter such as sulfur and iron and shall have a pH value between four and five. Deliver air dry.

- D. Fir Bark: Shall be shredded, composted fir bark, free of weeds, dust, and other foreign matter.

- E. Sand: Shall be clean, sharp mason's sand conforming to ASTM C-144.

2.9 LEAF MOLD

- A. Leaf mold shall come from an approved source. It shall conform to the following acidity and electrical conductivity ranges:

- 1. Acidity: pH 6.0 to 7.0 inclusive
- 2. Electrical Conductivity: The electrical conductivity (salt content) shall be less than two thousand (2000) micromhos/cm. It shall be tested using modified methods from the American Society of Agronomy procedures manual Methods of Soil Analysis Part 1 & 2, No. 9 in the Series Agronomy, and from the Annual Book of ASTM Standards, Methods D2974 and D2976.
- 3. Leaves shall be composted and turned sufficiently to destroy all weed seeds.

2.10 BONEMEAL (0-12-0)

- A. Bonemeal shall be a formulated organic fertilizer having a guaranteed analysis as follows:

0% Nitrogen  
12% P2O5

0% K2O

## 2.11 FERTILIZERS FOR EXTERIOR PLANTING

- A. Fertilizer: Organic, containing not less than 5 percent nitrogen, 10 percent available phosphoric acid and 5 percent water soluble potash.
- B. Other organic fertilizers with a 1-2-1 ratio such as 10-20-10 or 6-12-6 may be substituted for above.
- C. Mychorrizal fungal transplant inoculant Mycor Tree Saver, or equivalent granular product. Mycor Tree Saver shall be as manufactured by Plant Health Care, Inc., 440 William Pitt Way, Pittsburgh, PA 15238. Telephone: 1.800.421.9051.

## 2.12 FERTILIZER FOR INTERIOR PLANTING

- A. Fertilizer for interior plantings shall be an organic 10-6-4 fertilizer for application in April and June. For September application, it shall be an organic 5-10-5 fertilizer.

## 2.13 WELL-ROTTED MANURE

- A. Manure shall be well-rotted horse or cow manure or a combination of well-rotted horse and cow manure. It shall contain not over forty (40) percent of straw or litter and shall be free from fresh manure, sawdust, wood chips, leather chips, tan-bark, long straw, salt hay, stones, chemicals used to hasten decomposition artificially and other foreign or injurious substances. It shall be no more than two (2) years or less than nine (9) months old and shall have been turned in the pile at least three (3) times during that period. No burned or fire flanged manure will be accepted. The Commissioner may inspect the manure before delivery but reserves the right to reject on or after delivery any material which does not, in his/her opinion, meet these specifications. When manure is to be stored on the site, it shall be done as directed by the Commissioner.

## 2.14 LIMESTONE

- A. Ground Limestone (Calcium Carbonate) shall have the following analysis: at least fifty percent (50%) shall pass a 200 mesh sieve; at least ninety percent (90%) shall pass a 100 mesh sieve; and one hundred percent (100%) shall pass a 10 mesh sieve. Total carbonates shall not be less than eighty (80) percent or 44.8% Calcium oxide equivalent. Pelleted limestone may be substituted at the discretion of the Commissioner, when wind conditions exceed five (5) miles per hour.
- B. Limestone shall come from recycled sources.

## 2.15 WATER

- A. Water shall be suitable for irrigation and shall be free from ingredients harmful to plant life.
- B. Water shall come from rainwater or grey water sources.

## 2.16 ALUMINUM SULFATE

- A. Aluminum sulfate shall be unadulterated and shall be delivered in containers with the name of the material, manufacturer, and net weight of contents.

2.17 MULCH

- A. Shredded Hardwood Bark Mulch for exterior plantings
  - 1. Bark mulch shall be 100% organic, weed free, non-splintering, non-toxic, and natural color.
  - 2. It shall be category 3 base bark having a maximum of 10% wood fiber, fibrous in nature and processed in accordance with the National Bark Producers Association.
  - 3. It shall be free of all slabbing and large particles, 92% passing one half inch (1/2") screen and shall have a pH of approximately 6.1 as manufactured by Greenlife Products Company, West Point, VA, or approved equal.
  - 4. Elm bark is not acceptable.

2.18 GUYING AND STAKING MATERIALS

- A. Tree Stakes: White cedar stakes with bark attached, middle diameter of 2 1/2" to 3" and a butt diameter of not more than 3 1/2".
- B. Treestrap: Cotton treestraps shall be style # 3732T Biodegradable Tackstrap as manufactured by GCS Inc., North Wales, PA 19454. (215) 661-9070, <http://www.treestrap.com/contact.html>, or approved equal.

2.19 ANTIDESICCANT

- A. Antidesiccant shall be an emulsion specifically manufactured for plant protection which provides a protective film over plant surface which is permeable enough to permit transpiration. Antidesiccant shall be delivered in manufacturer's sealed containers and shall contain manufacturer's printed instructions for use.
- B. Antidesiccant shall be equal to the following, or approved equal:

Product	Manufacturer
Wiltpruf	Nursery Specialty Products, Inc. Stubbins Road, Groton Falls, NY

2.20 SAND FOR SOIL AMENDMENTS

- A. Sand shall consist of clean, hard, durable, uncoated stone particles, free from lumps of clay and all deleterious substances. Sand shall be so graded that when dry, one-hundred percent (100%) shall pass through a one-quarter inch (1/4") square opening sieve; not more than thirty-five percent (35%) by weight shall pass a No.50 sieve and not more than ten percent (10%) by weight shall pass a No.100 sieve. Sand may be rejected for this class if it contains more than ten percent (10%) by weight of loam and silt.

2.21 PORTABLE DRIP IRRIGATION SYSTEM



- A. TreeGator portable drip irrigation system shall be the following:
1. Constructed of U.V. stabilized, reinforced, rip-stop polyethylene with reinforced nylon zippers.
  2. Each tree irrigation bag to have 20 gallon water capacity and weigh 1 1/2 pounds empty.
  3. Tree irrigation bags shall be as manufactured by Spectrum Products, Raleigh, NC 27619-8187, or approved equal.
  4. Tree irrigation bags shall become the property of the City of New York at the end of the Guarantee period.

### PART 3 – EXECUTION

#### 3.1 EXAMINATION OF SUBGRADE PRIOR TO EXTERIOR PLANTING OPERATIONS

- A. Subgrade shall be examined by the Contractor prior to start of planting work. Subgrade shall have been graded smooth and parallel to finish grades compacted to 90 percent. Subgrade shall drain perfectly. The Commissioner shall have examined results of subgrade soil tests prior to the start of planting work. The Commissioner shall have examined drainage and compaction of subgrade materials immediately before start of planting work. Any unacceptable subgrade conditions shall be brought to the attention of the Commissioner and corrected before planting work commences.
- B. The Contractor shall place barricades as required to prevent any unnecessary compaction or disturbance of rough grading.
- C. Limit subgrade preparation to areas that will be planted in the immediate future.

#### 3.2 DRAINAGE OF SOILS

- A. Test drainage of planting beds and tree pits chosen by the Commissioner shall be done by filling with water twice in succession. The time at which water is put into the pit or bed for a second filling shall be noted. The Commissioner shall then be notified of the time it takes for pit or bed to drain completely. Planting operations shall not proceed until the Commissioner has reviewed test drainage results.
- B. The Contractor shall notify the Commissioner in writing of all soil or drainage conditions that he considers detrimental to growth of plant material.

#### 3.3 SCARIFYING SUBGRADE FOR EXTERIOR PLANTINGS

- A. Subgrade shall be brought to true and uniform grade and cleared of all extraneous materials by Contractor. After trees have been placed on subgrade, topsoil shall be backfilled throughout entire planting bed between tree balls.
- B. Tree balls shall be placed directly on thoroughly compacted undisturbed subgrade to prevent settlement.

#### 3.4 AMENDING EXISTING EXTERIOR SOIL ON SITE

- A. If existing site soil tests show that existing soil is satisfactory for reuse as topsoil, it shall be amended with the appropriate materials for use as planting soil mix. Where it is

found to be unacceptable for use, or contains materials toxic to plants or humans, it shall be removed from the site and disposed of in a manner legal in New York State.

- B. Woody Plantings: Contractor to add leaf mold, to 25% by volume, into the upper one (1) foot of soil. Leaf mold shall be thoroughly mixed in to the satisfaction of the Commissioner. Contractor to add elemental sulfur at a rate of 1 to 1 1/4 pounds to 50 gallons of water per 100 square feet to change the soil acidity by 1 pH unit if need is indicated by soil tests.

### 3.5 LAYOUT OF EXTERIOR PLANTING AREAS

- A. Individual plant locations and outlines of shrub and ground cover areas to be planted shall be staked by the Contractor in ample time to allow inspection by the Commissioner.

### 3.6 PLANTING SEASON FOR EXTERIOR PLANTS

- A. Spring Planting for trees, vines and ferns:

1. Spring planting of deciduous plants may commence after March 15<sup>th</sup> or as soon as the ground has thawed at the nursery and at the site of planting, and weather conditions make it practicable to work both at the nursery and at the site.
2. Unless otherwise directed by the Commissioner, evergreen plant material shall be planted from April 1<sup>st</sup> to May 15<sup>th</sup>.
3. Spring planting of deciduous plants shall not occur any later than June 1.
4. Please note that the specified street trees, *Ostrya virginiana* and *Quercus phellos*, are Spring planting only.

- B. Fall Planting for trees, vines, and ferns:

1. Fall planting for deciduous trees and shrubs may commence September 15<sup>th</sup> and shall continue until December 1<sup>st</sup> or such time as the ground has frozen or weather conditions make it impractical to work.
2. Fall planting period for evergreen trees and shrubs shall be September 1<sup>st</sup> to October 15<sup>th</sup>.

- C. Regardless of the dates specified above, planting shall only be performed when weather and soil conditions are suitable for planting the material specified in accordance with locally accepted practice.

- D. Planting season may be extended only with the written permission of the Commissioner.

### 3.7 PLANTING TREES, VINES, AND FERNS

- A. Balled and burlapped trees

1. Excavate and completely remove all soil from pits. Pit size shall be 2½ times the diameter of the root ball.
2. Wire baskets and/or non-biodegradable cloth wrapping shall be completely removed from the root ball.
3. Trees shall be located as indicated on the Drawings. Trees shall be placed on compacted clean fill such that when backfilled with planting soil mix, their root flares shall be completely exposed as per the drawings.
4. Trees shall be turned to desired orientation as requested by the Commissioner.

5. After trees have been properly placed, ropes or strings on top of ball shall be cut and pulled back. If burlap and binding reveal that the tree is set too deep relative to finished grade, the tree ball shall be rewrapped, removed and the subgrade depth raised with clean, compacted fill.
6. After final placement, burlap or cloth wrapping shall be left intact around the ball except that portions of wrap that are exposed at top of ball shall be turned over and buried or removed (approximately 1/3 of the burlap shall be turned back or removed). Non-biodegradable ball wrapping shall be totally removed from ball.
7. Tree pit shall be backfilled with Planting Soil Mix, as specified.
8. Contractor shall fertilize each tree using Mycor Tree Saver or equal. Use 3 ounces per each foot diameter of the rootball, or 3 ounces per inch caliper. Mix into the backfill. Mix product in a ring-shaped volume of soil around the upper portion of the root ball, extending from the soil surface to a depth of about 8 inches, and extending out from the root ball about 8 inches into the backfill.
9. Saucers shall be formed around plant pits as indicated on the Drawings.
10. Saucer shall be filled with water and water left to soak in. Saucer shall then be filled with water again.

B. Containerized vines and ferns

1. Contractor shall layout sample sections with vines, ferns and/or staked tree locations. Where trees, vines and ferns, etc. are to be planted in the same bed, and after approval by Commissioner, shrubs shall be placed on compacted clean well drained fill and backfilled to the level of the bottom of the shrub root balls with Planting Soil Mix.
2. Planting Soil Mix shall be tamped firmly around trees prior to placement of vines and ferns. Planting soil mix shall be firmly tamped under shrub root balls.
3. Containerized ferns shall be planted according to spacings indicated on the Plant Schedule and Drawings. If placing in the same planting bed, no ferns shall be planted until all trees and vines are planted.
4. Ferns shall be removed from pots; roots shall be combed; and the plants placed in the prepared planting soil which shall then be tamped to set the plants firmly in place.
5. One 3-oz. scoop of Mycor Tree Saver or equal granular product, containing mycorrhizal fungal transplant inoculant, Terra-Sorb or equivalent hydrogels, natural humates, yucca plant extract and seaweed meal, shall be evenly spread in a ring up to 8" wide around the outside edge of EACH root ball for vines and ferns.
6. Finish backfilling around each fern and vine. Thoroughly mix area around edge of rootball up to 8" wide to a depth of 8". Tamp all areas solidly and evenly. Soil shall be worked carefully into voids and pockets. Every effort shall be made to create a uniform level of compaction throughout all plant beds.
7. After completely planting each group of shrubs, Contractor shall mulch the entire area to a depth of 2" with shredded hardwood bark mulch.
8. Planting bed shall be thoroughly watered and water left to soak in; it shall then be thoroughly watered again.

3.8 APPLICATION OF FERTILIZER FOR EXTERIOR PLANTS

- A. Fertilizer shall be as described in Article 3.7 above

3.9 GUYING

- A. Each Street Tree shall be staked in accordance with the Drawings and Specifications. Plants shall stand plumb after staking.

### 3.10 MULCHING

- A. Shredded hardwood bark mulch shall be applied to a depth of two (2) inches in all individual tree pits and in all planting beds. Keep an inch away from the base of all stems of vines and 12" from the trunks of all trees and bamboo culms. Do not bury ground cover plants or ferns.

### 3.11 PRUNING

- A. Each tree and shrub shall be pruned only as needed to repair damage, taking care to preserve the natural character of the plant. Pruning shall be done after delivery of plants and after plants have been inspected and approved by the Commissioner. Pruning procedure shall be reviewed with the Commissioner before proceeding.
- B. Pruning shall be done with clean, sharp tools. Cuts shall be made to the branch collar, neither cutting flush nor leaving stubs. No tree paint shall be used.
- C. Dead wood, suckers, and broken and badly bruised branches shall be removed.

### 3.12 WATERING

- A. Trees, vines and ferns
  - 1. Plants shall be flooded with water twice within the first twenty-four (24) hours of the time of planting, and not less than twice per week until acceptance or for one month, whichever is greater. Do not disturb soil contour in bed during watering process.
  - 2. The Contractor shall be responsible for providing all equipment required to water the plants as specified herein.
  - 3. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary and in sufficient quantities to maintain moist soil to a depth of at least 4 inches.
  - 4. Two (2) Tree irrigation bags, zipped together, shall be required for each street tree. Two open holes per bag, with an approximate 6-10 hour leak time. The Contractor shall remove TreeGator bags at the end of each watering period. Tree irrigation bags shall be filled three (3) times per week from April 15th through November 15th.

### 3.13 INTERIOR PLANTING OPERATIONS

- A. Examination: The Contractor shall verify that the required drainage system is in place and functioning properly, and that the waterproofing system is in place and has been tested prior to the installation of any planting materials or accessories.
- B. Installation of Planting Mix
  - 1. Coordinate with any affected trades to insure their work is complete so as not to disturb planting medium after it has been placed.
  - 2. Confirm rough grades are at elevations given on the Drawings. Contractor shall correct deviations prior installation. Stake rough grade areas to indicate required depths of intermediate mix and planting medium. Insure contour of intermediate mix reflects contour of finished media layer above.

3. Place layer of intermediate mix as indicated on the Drawings; add water evenly to moisten. Hand tamp this layer, placing additional mix as necessary to bring top level of mix to twenty-four (24) inches below finished planting level.
4. Place planting medium in eight (8) inch lifts. As each lift is placed, saturate and firmly compress by hand, tamping to eliminate air pockets.
5. Randomly check each layer with a soil probe to insure the media is firm and thoroughly moistened. Moisten and firm dry or loose media before continuing.
6. Avoid depositing planting medium in drains.
7. Fine grade the planting medium to eliminate rough, low, or soft areas and to insure final grade conforms to contours on Drawings.
8. Make grade adjustments as necessary around footings, curbs, walls, and other construction, including electrical and plumbing features within the planter. Insure planting medium does not interfere with the function of vents, drains, clean-outs, or other utilities within the planter areas.

C. Plant Material Shipping and Handling

1. Shipping Times: All plants from Florida, California, and other climatic zones shall be delivered to the project area at such time as is accepted as best for the health and survival of the plants. The methods of handling shall comply with the best methods established by the American Nursery and Landscape Association for the areas of the country involved.
2. All shipments of plants shall be by a carrier experienced in the handling and shipment of live tropical plants. Each load of plants shall have a tamper-proof high/low thermometer indicating conditions during the trip. This device shall be requested by the Contractor and provided by the shipping company.
3. It shall be the Contractor's responsibility for delivery and installation. Further, the Contractor shall be responsible, except as otherwise stipulated herein, to protect all plants stored at the project premises during installation from any and all damage, theft, or deterioration of health or appearance (theft or conditions adverse to the plants' health or appearance).

D. Planting:

1. Time of Delivery and Planting: Coordinate with the Commissioner to insure delivery and receipt of plant materials is conducted under favorable site conditions, that access to the building is clear, and that suitable on-site staging areas and other facilities are available for efficient installation.
2. Upon receipt of plant materials: Contractor shall secure the tamper-proof high/low temperature indicator within each trailer as it is opened. Should the Commissioner request such a recorder, the Contractor shall comply with the request.
3. During the Installation Phase, the Contractor shall immediately report to the Commissioner any unsatisfactory environmental conditions or use of construction materials that may adversely affect the work or the life and growth of the plants.
4. The Contractor shall provide and install suitable protective coverings for all surfaces of the building or paved areas during delivery and planting operations.
5. Protect plants when moving to avoid damage to plant materials. Wrap as necessary to protect from cold air. Tie back branches to reduce canopy width before moving through doors and openings.
6. Locate trees and plants where shown on plans and details, except where obstructions are encountered or where changes have been made in construction, necessary relocation shall be determined by the Commissioner.
7. Planting sequence in bed plantings should be coordinated with other trades.
  - a. Remove plants from grow pots with care and install in planting medium.

- b. For plant materials with a root ball of 17 inches diameter and greater: Place material as indicated on plan, insuring the appropriate depth of intermediate mix exists below each root ball. Add planting medium to the height of the top of the root ball; water planting medium and root ball thoroughly and deeply to set plants and allow for any further settling.
  - c. When all large plants are installed in an area, add planting medium to re-establish finished grade as shown in the Drawings.
  - d. Place all remaining plants. Water planting media heavily and evenly. Place additional planting medium as necessary to allow for settlement.
- E. Pruning: All bamboo shall be pruned in accordance with good horticultural practice and as directed by the Commissioner. Remove dead, injured shoots and broken culms. Remove any culms that interfere with the desired shape of the plant. Do not change natural habit or shape of plant. The bamboo plant shall be rejected if there are insufficient well-developed culms after removal of damaged material.

### 3.14 GUARANTEE SERVICE - GENERAL

- A. The Contractor shall maintain all planting in accordance with these specifications and drawings, and to the satisfaction of the Commissioner, for two years after the acceptance, and until final acceptance and completion of all planting in the contract.
- B. The Contractor shall submit to the Commissioner for approval a proposed maintenance schedule specifying men, materials, and equipment required to comply with the maintenance provisions. The proposed schedule shall commence two (2) weeks from the date of acceptance.
- C. Maintenance shall consist of pruning, watering, cultivating, weeding, mulching, removal of dead material, repairing, replacing or removal of tree stakes as directed by the Commissioner, adjusting and/or removal of tree straps as directed by the Commissioner, resetting plants to proper grades and upright position, repair of minor washouts and gullies, and furnishing and applying such organic sprays as are necessary to keep plantings free of insects and disease. Plants shall be maintained in a healthy growing condition using the above and other horticultural operations necessary for the proper growth of all plants. The entire area shall be kept neat in appearance. All maintenance operations shall be by means acceptable and approved by the Commissioner. Note that all materials and replacements used during the maintenance period shall conform to Section 2, Products of this Specification.
- D. Maintenance shall be repeated at least once every three weeks. Dead, dying or undesirable plants shall be removed during this period at the direction of the Commissioner.
- E. Weeds shall not be allowed to attain more than six inches of growth, unless otherwise directed by the Commissioner.
- F. Fertilizer for interior plants: Apply a weak solution of soluble fertilizer high in nitrogen immediately after planting. After the first year, use two applications of 50% organic 10-6-4 fertilizer once in April and again in June. Use an application of 50% organic 5-10-5 in September.

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## SECTION 33 40 00

## STORM DRAINAGE UTILITIES

## PART 1 - GENERAL

## 1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. General Requirements, LEED BUILDING: The City of New York requires the Contractor to implement practices and procedures to meet the environmental performance goals for the Project, which include achieving LEED™ certification. Specific project goals which may impact this and the other sections of this specification include: use of materials with recycled content; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. The Contractor shall ensure that the requirements related to these goals, 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 his Subcontractors shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

## 1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the access doors as indicated on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. Internal Storm Drain.
  - 2. Yard Drain.
  - 3. Drywell System.

## 1.3 RELATED SECTIONS

- A. Division 01 – DDC General Conditions.
- B. Plumbing – Division 22.
- C. Earthwork – Section 31 20 00.

## 1.4 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. The Contractor shall be responsible to retain an independent certified laboratory for testing of any poured in place concrete (if applicable) and for soil density tests.
- C. The Contractor is required to provide manufacturer certification for all types of pipes



used as specified, and all pre-cast drywells and trench drains.

- D. The Contractor is responsible for coordinating all the surveying work (stake-out, line and grade, etc.) that is necessary for the work.
- E. Reference Standards: The work is subject to requirements of applicable portions of the following standards:
  - 1. Sewer Design Standards, New York City Department of Environmental Protection.
  - 2. Standard Sewer Specifications, New York City Department of Design and Construction.
  - 3. Building Code of the City of New York.
  - 4. American Standards Association for Cast Iron Pipe.
  - 5. American Water Works Association for Cast Iron Fittings.
  - 6. American National Standards Institute.
  - 7. American Concrete Institute.

#### 1.5 SUBMITTALS

- A. LEED BUILDING Submittal Requirements: Any substitution must also comply with the LEED requirements listed for the specified item.

The contractor and their subcontractors shall submit the LEED Building certification items in accordance with Section 01 81 13: Sustainable Design Requirements. LEED Building submittals shall include the following, as applicable:

- 1. A completed GREEN BUILDING MATERIALS REPORTING FORM. Information to be provided for this form shall include:
  - a. Cost breakdowns for the materials included in the contractor's or subcontractor's work. Cost breakdowns must include total installed cost and material-only cost (excluding labor and equipment).
  - b. The percentage (by weight) of post-consumer and pre-consumer recycled content in the submitted product(s), if any.
  - c. Indication of whether the extraction, harvesting, or recovery as well as manufacturing location for the supplied product(s) is within 500 miles of the project site. If the product is only partially manufactured within a 500 mile radius, the percentage (by weight) that complies.
  - d. For field applied interior adhesives, sealants, coatings and paints, provide the VOC content in grams/Liter (g/L).
  - e. Identification of engineered wood, composite wood, agrifiber products and the use of laminating adhesives with added urea-formaldehyde resins, if applicable.
- 2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied for the GREEN BUILDING MATERIALS REPORTING FORM.
- 3. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) content of products submitted (If an MSDS does not include a product's VOC content, 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 content).
- 4. The LEED Building Submittal information shall be assembled into one package per Specification section (or per subcontractor), and sent to the Commissioner

for review. Incomplete or inaccurate LEED Building submittals may be used as the basis for the Commissioner's rejection of products or assemblies.

- B. The Engineer shall file and obtain an approved Site Connection Proposal with the NYC DEP. The Site Connection approval will be valid for a period of two (2) years.
- C. In the event that the Contractor wishes to use materials that are not as per the NYC DEP Sewer Design Standards or the NYC Building Code, they shall submit shop drawings to the Engineer for approval.

#### 1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary. The Contractor shall not accept delivery of any damaged materials to the site. Damaged materials shall not be used. The Inspector shall have final say over any materials in question.

#### 1.7 SAFETY

- A. In regards to sheeting of the sewer trench during excavation, the Contractor shall comply with the provisions of New York State Labor Law and particularly with Rule No. 23 (as amended) of the Industrial Code as promulgated by the Board of Standards and Appeals, Department of Labor, State of New York. Where the spacing of stringers and cross-bracing specified in the above stated Rule No. 23 are such that the Contractor can not adequately and in a practical manner carry on his operations, he shall submit to the Engineer for approval, an alternate scheme and design for sheet piling or shoring with all bracing as may be necessary to comply with the intent of Rule No. 23.
- B. The Contractor shall post signs for safety. Local traffic is to be maintained at all times. A Flag Man shall be used to direct traffic when necessary.
- C. All materials are to be stored as directed by the Commissioner. No stock piling material or equipment in the street is permitted.
- D. The Contractor is responsible for utility company notification – Code 53.
- E. It is recommended that the Contractor take some photographs of the area before the commencement of the work.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Internal Storm Drain
  - 1. The internal storm drainage system shall be E.H.C.I. pipe or D.I. pipe.
- B. Yard Drains

1. Basis-of-Design Product: Subject to compliance with requirements, provide yard drain by Campbell Foundries, No. 3192-0400 or a comparable product by one of the following:
  - a. Josam Company; Josam Div.
  - b. MIFAB, Inc.
  - c. Neenah Foundry
  - d. Zurn Plumbing Products Group; Light Commercial Operation
2. Pattern: ADA Compliant grate.
3. Body Material: Cast iron.
4. Grade: vandal proof; heel proof.
5. Dimensions of Body: 18"x18".

C. Drywell System

1. Pre-cast 10'-0" diameter storm drain rings shall be used. Any deviation shall be approved by the Engineer prior to ordering the rings.
2. Circular pre-cast 10'-0" diameter top slab (H20 traffic load) shall be used. A 24" access opening shall be provided per plan.
3. A solid grate shall be provided atop the access opening per plan.
4. Concrete strength shall be 4,000 psi for 28 days.
5. Drywells shall be in accordance with the NYC Building Code (RS 16-9B).
6. Gravel size to be used shall be 1.5" minimum. The use of recycled stone is not permitted.
7. Filter fabric shall be used to wrap the drywell system on the sides and the top.
8. A 24" diameter PVC pipe shall be used over the sand column (if required). The length of the pipe shall be 6 feet, with 1 inch diameter openings at 4 inches on center.

PART 3 - EXECUTION

3.1 INSPECTION

A. Internal Storm Drain

1. The internal storm drainage system is subject to a controlled inspection by a Professional Engineer. The Inspector shall supply the Commissioner with the required Technical Report forms when drainage construction is complete.
2. The Contractor shall notify the Inspector 48 hours prior to the commencement of work.
3. All storm drainage and appurtenances within the property lines of this project are under the jurisdiction of the NYC DOB and subject to controlled inspection.

B. Yard Drains

1. The Contractor shall not accept delivery of any damaged materials to the site.
2. Manhole covers and other appurtenances of the drainage system shall not bear any identification to the NYC DEP.

C. Drywell System

1. The new drywell system is subject to Special Inspection and by the NYC DOB. The Contractor shall notify the Inspector 48 hours prior to the commencement of work. The Inspector shall notify the NYC DOB of the drywell installation. The Inspector shall supply the Owner with the required Technical Report forms when drywell construction is complete.

3.2 INSTALLATION

- A. The Contractor is responsible for the location, maintenance, removal and/or relocation of all utilities within the project limits. The Contractor is responsible for immediately notifying the Owner in the event that any uncharted or incorrectly charted utilities are encountered during construction. The Contractor shall take measure to insure no debris enters into the drainage system during construction. At the end of construction, the Contractor shall clean out all drains.

B. Internal Storm Drain

1. The pipe shall be laid on  $\frac{3}{4}$ " to 1- $\frac{1}{4}$ " crushed stone bedding, at a minimum depth of 9" under the pipe and up to the center of the pipe.
2. The stone and pipe shall be wrapped in filter fabric (Mirafi 140 or equivalent).
3. Clean backfill shall be approved clean earth or sand of low silt and clay content (less than 12% passing no. 200 sieve), free from bricks, blocks, excavated pavement materials and debris, stumps, roots and other organic material. All material shall be free from frost at time of placement.

C. Yard Drains

1. Pre-cast structures shall be set on 6" minimum leveled compacted stone ballast or as directed by the Engineer.
2. Invert shelves shall have a  $\frac{1}{2}$ " per linear foot pitch towards the sewer.
3. All covers and grates to be flush with grade.

D. Drywell System

1. If a permeable sand layer is below the depth of the bottom of the drywell system, then a 3' x 7' sand column shall be installed as per the plan (as required). The sand column shall be dug to a depth of at least 5 feet into permeable strata.
2. There shall be a minimum separation of 2 feet from the bottom of the drywells to the groundwater table.
3. The drywell rings shall be surrounded by 12 inch minimum of stone and wrapped in filter fabric. Drywells shall be set on a minimum of 12 inches of stone.

4. Stone shall be placed up to the bottom of the traffic slabs.
- 5.. Filter fabric shall be wrapped over the entire system; minimum of 12 inch overlap on top of rings and on the sides.

END OF SECTION



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

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**Contract for Furnishing all Labor and Material Necessary and Required for:**

**CONTRACT NO. 1              GENERAL CONSTRUCTION WORK**

# **East Elmhurst Branch Library Expansion**

**LOCATION:                      95-08 Astoria Boulevard  
BOROUGH:                    Queens 11369  
CITY OF NEW YORK**

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Contractor \_\_\_\_\_

Dated \_\_\_\_\_, 20\_\_\_\_

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Entered in the Comptroller's Office \_\_\_\_\_

First Assistant Bookkeeper \_\_\_\_\_

Dated \_\_\_\_\_, 20\_\_\_\_

